

Literatursuche ChatGPT

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Authors	Title	Journal	Year	Volume	Issue	Pages	Keywords	Abstract	DOI	URL
	The AI writing on the wall	NATURE MACHINE INTELLIGENCE						Guidelines are urgently needed for the use of generative AI tools like ChatGPT in scientific writing.	10.1038/442256-023-00613-9	
F. Ali, Zhang, Q. Y., Tauri, M. Z., Shahzad, K.	Social Chatbot: My Friend in My Distress	INTERNATIONAL JOURNAL OF HUMAN-COMPUTER INTERACTION					PROBLEMATIC INTERNET USE, CONTINGENT SELF-WORTH, PERSONALITY-TRAITS, LIFE SATISFACTION, SMARTPHONE USAGE, MEDIA USE, ADDICTION, ANXIETY, ESTEEM, FEAR	This study investigates the impact of social interaction anxiety on compulsive chat with a social chatbot named Xiaoice. To provide insights into the limited literature, the authors explore the role of negative evaluation (FONE) and fear of rejection (FOR) as mediators in this relationship. By applying a variance-based structural equation modeling on a non-clinical sample of 366 Chinese university students who have interacted with Xiaoice, the authors find that social interaction anxiety increases compulsive chat with a social chatbot both directly and indirectly through fear of negative evaluation and rejection, with a more substantial effect of the former. The mediating effect of fear of negative evaluation transfers through fear of rejection, which establishes a serial link between social interaction anxiety and compulsive chat with a social chatbot. Further, frustration about unavailability (FAU) strengthens the relationship between FOR and compulsive chat with a social chatbot (CSCS). These findings offer theoretical and practical insights into our understanding of the process by which social interaction anxiety influences chat behavior with a social chatbot.	10.1080/10447318.2022.2150745	
S. Baek, Kim, J., Lee, J., Lee, M.	Implementation of a Virtual Assistant System Based on Deep Multi-modal Data Integration	JOURNAL OF SIGNAL PROCESSING SYSTEMS FOR SIGNAL, IMAGE AND VIDEO TECHNOLOGY					Integrated system, Transfer learning, Natural language processing, Image processing, Action recognition, Gesture recognition, CONVOLUTIONAL NEURAL-NETWORK, RECOGNITION, ATTENTION	In this study, we propose a virtual assistant system that is applied to real life using signal processing and deep learning. First, the overall structure of the proposed system that integrates and controls various modules is introduced, after which we present a multi-modal fusion module that provides services to users. It integrates a natural language processing module for interpreting Korean chatbots and a behavior recognition module for understanding user behavior using an RGB camera. In addition, a hand gesture recognition module was utilized to understand the user's intentions using depth and RGB images. We explain the implementation of a customized service system with several parts: i) a user interface module that interacts with the user, ii) a face recognition module that distinguishes different users, and iii) a voice processing module that can replace the input and output methods through a keyboard and monitor. To check the performance of each module, a testbed was configured in an office environment. Through test results, we successfully demonstrate the realization of the proposed system in real life. Finally, we list the challenges discovered during the operation of this system and suggest directions for further research.	10.1007/s11265-022-01829-5	
S. Bansal, Nangia, P., Singh, S., Garg, I.	Electronic Retailing: Mapping the past for informing the future	INTERNATIONAL REVIEW OF RETAIL DISTRIBUTION AND CONSUMER RESEARCH					e-tailing, online consumer behavior, online retail, systematic literature review, FULFILLMENT DECISIONS, CUSTOMER EXPERIENCE, ONLINE, PERSPECTIVES, MANAGEMENT, INVENTORY, CRITIQUE	The continuous growth of information and technology has resulted in considerable changes in the retailing environment, with a restriction on brick-and-mortar retailing and a push toward online retailing. The purpose of this study is to map the available literature on e-tailing in order to forecast where the field might be headed in the coming years and to identify the key features that contribute to e-tailing businesses. The paper employs an integrative review methodology and bibliometric method as a computational tool, and selected Web of Science and SCOPUS databases), to identify the most productive research disciplines and countries that conduct the majority of e-tailing research. The study examines major themes such as consumer behavior and perception, technology and media, pricing strategies, channel integration, cognitive impact, business strategies, and models, and channel strategies to provide a comprehensive framework of e-tailing. This is the first study to present a thorough picture of e-tailing by identifying topics, research evolution, annual publishing trends, and the most relevant journals. The study offers future research areas in the form of thematic propositions and advocates greater research into upcoming trends such as voice assistants, chatbots, AI, and direct-to-consumer markets while adding relevant concepts.	10.1080/09593969.2022.2152075	
G. Bonetta, Ribero, M., Cancelliere, R.	Regularization-based pruning of irrelevant weights in deep neural architectures	APPLIED INTELLIGENCE					Sparsity, Pruning, Regularization, NLP, Image processing	Deep neural networks exploiting million parameters are currently the norm. This is a potential issue because of the great number of computations needed for training, and the possible loss of generalization performance of overparameterized networks. We propose in this paper a method for learning sparse neural topologies via a regularization approach that identifies nonrelevant weights in any type of layer (i.e., convolutional, fully connected, attention and embedding ones) and selectively shrinks their norm while performing a standard back-propagation update for relevant layers. This technique, which is an improvement of classical weight decay, is based on the definition of a regularization term that can be added to any loss function regardless of its form, resulting in a unified general framework exploitable in many different contexts. The actual elimination of parameters identified as irrelevant is handled by an iterative pruning algorithm. To explore the possibility of an interdisciplinary use of our proposed technique, we test it on six different image classification and natural language generation tasks, among which four are based on real datasets. We reach state-of-the-art performance in one out of four imaging tasks while obtaining results better than competitors for the others and one out of two of the considered language generation tasks, both in terms of compression and metrics.	10.1007/s10489-022-04353-y	
L. C. Budtler, Gosak, L., Stiglic, G.	Review of artificial intelligence-based question-answering systems in healthcare	WILEY INTERDISCIPLINARY REVIEW: DATA MINING AND KNOWLEDGE DISCOVERY					artificial intelligence, conversational agents, ChatGPT, health care, machine learning, EMBODIED CONVERSATIONAL AGENT, ASSISTANT, CHATBOT, FEASIBILITY	Use of conversational agents, like chatbots, avatars, and robots is increasing worldwide. Yet, their effectiveness in health care is largely unknown. The aim of this advanced review was to assess the use and effectiveness of conversational agents in various fields of health care. A literature search, analysis, and synthesis were conducted in February 2022 in PubMed and CINAHL. The included evidence was analyzed narratively by employing the principles of thematic analysis. We reviewed articles on artificial intelligence-based question-answering systems in health care. Most of the identified articles report its effectiveness, but it is known about its use. We outlined study findings and explored directions of future research, to provide evidence-based knowledge about artificial intelligence-based question-answering systems. This article is categorized under: Fundamental Concepts of Data and Knowledge > Human Centricity and User Interaction; Application Areas > Health Care; Technologies > Artificial Intelligence	10.1002/widm.1487	
Q. Chen, Lu, Y. B., Gong, Y. M., Xiong, J.	Can AI chatbots help retain customers? Impact of AI service quality on customer loyalty	INTERNET RESEARCH					AI chatbots, Service quality, Satisfaction, Cognitive trust, Affective trust, Perceived value, Customer loyalty, INFORMATION-SYSTEMS SUCCESS, MULTIPLE-ITEM SCALE, E-COMMERCE, CONSUMER PERCEPTIONS, USABILITY, CONCEPTUALIZATION, MODERATING ROLE, MCLIFEM MODEL, TRUST	Purpose: This study investigates whether and how the service quality of artificial intelligence (AI) chatbots affects customer loyalty to an organization. Design/methodology/approach: Based on the sequential chain model of service quality loyalty, this study first classifies AI chatbot service quality into nine attributes and then develops a research model to explore the internal mechanisms of how AI chatbot service quality affects customer loyalty. The analysis of survey data from 459 respondents provided insights into the interrelationships among AI chatbot service quality attributes, perceived value, cognitive and affective trust, satisfaction and customer loyalty. Findings: The results show that AI chatbot service quality positively affects customer loyalty through perceived value, cognitive trust, affective trust and satisfaction. Originality/value: This study captures the attributes of the service quality of AI chatbots and reveals the significant influence of service quality on customer loyalty. This study develops research on service quality in the information system (IS) field and extends the sequential chain model of quality loyalty to the context of AI services. The findings not only help an organization find a way to improve customers' perceived value, trust, satisfaction and loyalty but also provide guidance in the development, adoption, and post-adoption stages of AI chatbots.	10.1108/NTR-09-2021-0686	
C. M. Dinh, Park, S.	How to increase consumer intention to use Chatbots? An empirical analysis of hedonic and utilitarian motivations on social presence and the moderating effects of fear across generations	ELECTRONIC COMMERCE RESEARCH					Chatbot, Social presence, Motivation, Artificial intelligence, Global pandemic, COVID-19, Fear, Generation cohort, Robot-human interaction, BEHAVIORAL-RESEARCH, SELF-DETERMINATION, SUPPORT, IMPACT, SATISFACTION, PERSPECTIVE, ACCEPTANCE, VARIABLES, PURCHASE, STRESS	As chatbots become more advanced and popular, marketing research has paid enormous attention to the antecedents of consumer adoption of chatbots. This has become increasingly relevant because chatbots can help mitigate the fear and loneliness caused by the global pandemic. Therefore, unlike previous work that focused on design factors, we theorize that social presence serves a mediating role between consumer motivations (i.e., hedonic and utilitarian) and intention to use a chatbot service based on self-determination theory. Our results from a structural equation model (n = 377) indicate that hedonic (but not utilitarian) motivation significantly affects chatbots' social presence, ultimately influencing intention to use the chatbot service. We also found that fear of COVID-19 amplifies the effect of social presence on intention to use the chatbot service. In this dynamic, we found an additional moderated moderation effect of generational cohorts (i.e., baby boomers and Generations X, Y, and Z) in experiencing different levels of fear of COVID-19. Overall, our findings emphasize the importance of motivation-matching features for consumer adoption of chatbot services. Our findings also indicate that marketers may utilize the fear element to increase adoption of chatbot services, especially when targeting the young generations (e.g., Generation Z).	10.1007/s10660-022-09662-5	
G. Dosovitsky, Bunge, E.	Development of a chatbot for depression: adolescent perceptions and recommendations	CHILD AND ADOLESCENT MENTAL HEALTH					Chatbots, depression, adolescent, behavioral activation, digital intervention, conversational agent	Background: Chatbots are a relatively new technology that has shown promising outcomes for mental health symptoms in adults; however, few studies have been done with adolescents or reported adolescent user experiences and recommendations for chatbot development. Methods: Twenty-three participants ages 13-18 (M-age = 14.96) engaged in user testing of a chatbot developed to psychoeducate adolescents on depression, teach behavioral activation, and change negative thoughts. Thematic analysis was conducted of participants' responses to user experience questions, impressions, and recommendations. Results: Over half (56.5%) of the sample completed the full intervention and provided user experience feedback online. The average NPS score was 6.04 (SD = 2.18), and 64.3% (n = 9) said they would use the chatbot in the future. Of all user experience responses, 54.5% were positive. The most common impressions were related to symptom improvement (61.1%) and availability (52.8%). The most frequent recommendations were related to solving technical problems (65%). Conclusions: Chatbots for mental health are acceptable to some adolescents, a population that tends to be reluctant to engage with traditional mental health services. Most participants reported positive experiences with the chatbot, believing that it could help with symptom improvement and is highly available. Adolescents highlighted some technical and stylistic problems that developers should consider. More pilot and user testing is needed to develop mental health chatbots that are appealing and relevant to adolescents.	10.1111/camh.12627	
B. Gordijn, ten Have, H.	ChatGPT: evolution or revolution?	MEDICINE HEALTH CARE AND PHILOSOPHY							10.1007/s11019-023-10136-0	
E. Han, Yin, D. Z., Zhang, H.	Bots with Feelings: Should AI Agents Express Positive Emotion in Customer Service?	INFORMATION SYSTEMS RESEARCH					emotional artificial intelligence, conversational agent, chatbot, customer service, emotional contagion, expectation-disconfirmation, relationship norm orientation, EXPECTANCY VIOLATIONS, SATISFACTION, CONTAGION, QUALITY, ONLINE, MODEL, DISPLAYS, MIND, CONSEQUENCES, WILLINGNESS	Customer service employees are generally advised to express positive emotion during their interactions with customers. The rise and maturity of artificial intelligence (AI)-powered conversational agents, also known as chatbots, beg the question: should AI agents be equipped with the ability to express positive emotion during customer service interactions? This research explores how, when, and why an AI agent's expression of positive emotion affects customers' service evaluations. We argue that AI-expressed positive emotion can influence customers via dual pathways: an affective pathway of emotional contagion and a cognitive pathway of expectation-disconfirmation. We propose that positive emotion expressed by an AI agent (versus a human employee) is less effective in facilitating service evaluations because of a heightened level of expectation-disconfirmation. We further introduce a novel individual difference variable, customers' relationship norm orientation, which affects their expectations toward the AI agent and moderates the cognitive pathway. Results from three laboratory experiments substantiate our claims. By revealing a distinctive impact of positive emotion expressed by an AI agent compared with a human employee, these findings deepen our understanding of customers' reactions to emotional AIs, and they offer valuable insights for the deployment of AIs in customer service.	10.1287/isre.2022.1179	
L. Henriksson	Chatting with the dead: the hermeneutics of thanabots	MEDIA CULTURE & SOCIETY					artificial intelligence, deadbots, digital endurance, digital ghosts, digital immorality, human-machine communication, natural language generation, natural language processing, thanabots, thanatechnology	In 2021, the San Francisco Chronicle released a feature article about a man who chose to resurrect his deceased fiancée by training a chatbot system built on OpenAI's GPT language models on her old digital messages. He then had emotional conversations with this chatbot, which appeared to accurately mimic the deceased's writing style. This case study raises questions about the communicative influences of thanabots: chatbots trained on data of the dead. While thanabots are clearly not just living conversational partners, the rhetoric, everyday experiences, and emotions associated with these systems have very real implications for living users. This paper applies a lifeworld perspective to consider the hermeneutics of thanabots. It shows that thanabots exist in a long lineage of efforts to communicate with the dead, but acknowledges that thanatechnologies must be more thoroughly studied for better understanding of what it means to die in a digital age.	10.1177/01634437221147626	
A. H. Huang, Wang, H., Yang, Y.	FinBERT: A Large Language Model for Extracting Information from Financial Text	CONTEMPORARY ACCOUNTING RESEARCH					deep learning, large language model, transfer learning, interpretable machine learning, sentiment classification, environment, social, and governance (ESG), EARNINGS, READABILITY, DISCLOSURE	We develop FinBERT, a state-of-the-art large language model that adapts to the finance domain. We show that FinBERT incorporates finance knowledge and can better summarize contextual information in financial texts. Using a sample of researcher-labeled sentences from analyst reports, we document that FinBERT substantially outperforms the Loughran and McDonald dictionary and other machine learning algorithms, including naive Bayes, support vector machine, random forest, convolutional neural network, and long short-term memory, in sentiment classification. Our results show that FinBERT excels in identifying the positive or negative sentiment of sentences that other algorithms mislabel as neutral, likely because it uses contextual information in financial text. We find that FinBERT's advantage over other algorithms, and Google's original bidirectional encoder representations from transformers model, is especially salient when the training sample size is small and in texts containing financial words not frequently used in general texts. FinBERT also outperforms other models in identifying discussions related to environment, social, and governance issues. Last, we show that other approaches underestimate the textual informativeness of earnings conference calls by at least 18% compared to FinBERT. Our results have implications for academic researchers, investment professionals, and financial market regulators.	10.1111/1911-3846.12832	

G. Jaimovich Lopez, Ferrit, C., Hernandez-Ortalo, J., Martinez-Plumed, F., Ramirez-Juantana, M. J.	Can language models automate data wrangling?	MACHINE LEARNING					Data science automation, Data wrangling, Language models, Machine learning pipelines	The automation of data science and other data manipulation processes depend on the integration and formatting of 'messy' data. Data wrangling is an umbrella term for these tedious and time-consuming tasks. Tasks such as transforming dates, units or names expressed in different formats have been challenging for machine learning because (1) users expect to solve them with short cues or few examples, and (2) the problems depend heavily on domain knowledge. Interestingly, large language models today (1) can infer from very few examples or even a short cue in natural language, and (2) can integrate vast amounts of domain knowledge. It is then an important research question to analyse whether language models are a promising approach for data wrangling, especially as their capabilities continue growing. In this paper we apply different variants of the language model Generative Pre-trained Transformer (GPT) to five batteries covering a wide range of data wrangling problems. We compare the effect of prompts and few-shot regimes on their results and how they compare with specialised data wrangling systems and other tools. Our major finding is that they appear as a powerful tool for a wide range of data wrangling tasks. We provide some guidelines about how they can be integrated into data processing pipelines, provided the users can take advantage of their flexibility and the diversity of tasks to be addressed. However, reliability is still an important issue to overcome.	10.1007/s10994-022-06259-9	
L. Q. Jing, U. Y. R., Xu, J. H., Yu, Y. C., Shen, P., Song, X. M.	Vision Enhanced Generative Pre-trained Language Model for Multimodal Sentence Summarization	MACHINE INTELLIGENCE RESEARCH					Multimodal sentence summarization (MMSS), generative pre-trained language model (GPLM), natural language generation, deep learning, artificial intelligence	Multimodal sentence summarization (MMSS) is a new yet challenging task that aims to generate a concise summary of a long sentence and its corresponding image. Although existing methods have gained promising success in MMSS, they overlook the powerful generation ability of generative pre-trained language models (GPLMs), which have shown to be effective in many text generation tasks. To fill this research gap, we propose to use GPLMs to promote the performance of MMSS. Notably, adopting GPLMs to solve MMSS inevitably faces two challenges: 1) What fusion strategy should we use to inject visual information into GPLMs properly? 2) How to keep the GPLM's generation ability intact to the utmost extent when the visual feature is injected into the GPLM. To address these two challenges, we propose a vision enhanced generative pre-trained language model for MMSS, dubbed as Vision-GPLM. In Vision-GPLM, we obtain features of visual and textual modalities with two separate encoders and utilize a text decoder to produce a summary. In particular, we utilize multi-head attention to fuse the features extracted from visual and textual modalities to inject the visual feature into the GPLM. Meanwhile, we train Vision-GPLM in two stages: the vision-oriented pre-training stage and fine-tuning stage. In the vision-oriented pre-training stage, we particularly train the visual encoder by the masked language model task while the other components are frozen, aiming to obtain homogeneous representations of text and image. In the fine-tuning stage, we train all the components of Vision-GPLM by the MMSS task. Extensive experiments on a public MMSS dataset verify the superiority of our model over existing baselines.	10.1007/s11633-022-1372-x	
E. B. Kang, Kang, Y. A.	Counseling Chatbot Design: The Effect of Anthropomorphic Chatbot Characteristics on User Self-Disclosure and Companionship	INTERNATIONAL JOURNAL OF HUMAN-COMPUTER INTERACTION					SOCIAL RESPONSES, MANIFEST PERSONALITY, INCREASES TRUST, THERAPIST, PSYCHOTHERAPY, RECOGNITION, GENDER, COMPUTERS, LANGUAGE, IMPACT	In recent years, there has been a growing interest in chatbots that play counseling roles in the psychological health field. Previous studies have proposed counseling chatbots; however, they have not examined the anthropomorphic characteristics of agents in detail. In counseling situations, the characteristics of counselors and counselees affect the counseling performance. This study proposes a counseling chatbot to perform an intake interview and classifies the anthropomorphic characteristics of the chatbot into three dimensions—gender, personality, and visual interface cue—to examine these characteristics' effects on user self-disclosure and companionship. Moreover, we examine the differences caused by user characteristics. No independent effect was observed for the gender of the chatbot or personality dimensions; however, a visual interface cue adversely affected the self-disclosure and companionship of the participants, and interaction effects were observed according to the combination of anthropomorphic characteristics. Furthermore, we found that the preferred chatbot differed according to gender. These results are significant and show that visual interface cues should be applied carefully while designing counseling chatbots. The anthropomorphism of the chatbot needs to be adjusted according to the user characteristics.	10.1080/10447318.2022.2163775	
A. K. Kovalev, Panov, A. I.	Application of Pretrained Large Language Models in Embodied Artificial Intelligence	DOKLADY MATHEMATICS					embodied artificial intelligence, large language models, common sense knowledge, construction of action plans	A feature of tasks in embodied artificial intelligence is that a query to an intelligent agent is formulated in natural language. As a result, natural language processing methods have to be used to transform the query into a format convenient for generating an appropriate action plan. There are two basic approaches to the solution of this problem. One is based on specialized models trained with particular instances of instructions translated into agent-executable format. The other approach relies on the ability of large language models trained with a large amount of unlabeled data to store common sense knowledge. As a result, such models can be used to generate an agent's action plan in natural language without preliminary learning. This paper provides a detailed review of models based on the second approach as applied to embodied artificial intelligence tasks.	10.1134/S1064564220060138	
Y. C. Kuo, Chen, Y. A.	The impact of chatbots using concept maps on correction outcomes—a case study of programming courses	EDUCATION AND INFORMATION TECHNOLOGIES					Program learning, Chatbot, Concept map, Online learning	With the development of science and technology, the demand for programmers has increased. However, learning computer programs is not an easy task. It might cause a significant impact on programming if misconceptions exist at the beginning of the study. Hence, it is important to discover and correct them immediately. Chatbots are effective teaching aids; they can assist students in eliminating misconceptions. They also assist teachers to instruct students according to their aptitude, which teachers found it hard to accomplish without technical supports when teaching in large classes. Therefore, this experiment uses chatbots to assist learners in the correction phase. We consider that learners who failed unit quizzes might have misunderstandings in programming concepts. We believe chatbots can teach according to individual misunderstandings and give correct responses to their unclear concepts. It is more effective than traditional teaching methods. In addition, to prevent human-computer interaction barriers, such as picking wrong keywords and giving plausible replies, or learners not being able to express their problems clearly, this experiment also adds concept maps to the chatbots' dialogue, to work as the dialogue structure for each chatbot. The maps help the chatbots to explain concepts in each unit systematically and logically. The chatbots give questions according to the concepts on the concept maps and ask learners to reply with their answers. An ANCOVA test investigated students' scores. Result showed the p-value is below 0.001, indicating that the group using concept map chatbots has better correction effects than the other group using only concept maps.	10.1007/s10938-022-11506-6	
L. Laestadius, Bishop, A., Gonzalez, M., Ilencik, D., Campos-Castillo, S.	Too human and not human enough: A grounded theory analysis of mental health harms from emotional dependence on the social chatbot Replika	NEW MEDIA & SOCIETY					Artificial intelligence, chatbots, emotional dependence, grounded theory, mental health, Reddit, CONVERSATIONAL AGENTS, ATTACHMENT, RESPONSES, MACHINES, VIOLENCE, GENDER	Social chatbot (SC) applications offering social companionship and basic therapy tools have grown in popularity for emotional, social, and psychological support. While use appears to offer mental health benefits, few studies unpack the potential for harms. Our grounded theory study analyzes mental health experiences with the popular SC application Replika. We identified mental health relevant posts made in the r/Replica Reddit community between 2017 and 2021 (n = 582). We find evidence of harms, facilitated via emotional dependence on Replika that resembles patterns seen in human-human relationships. Unlike other forms of technology dependency, this dependency is marked by role-taking, whereby users felt that Replika had its own needs and emotions to which the user must attend. While prior research suggests human-chatbot and human-human interactions may not resemble each other, we identify social and technological factors that promote parallels and suggest ways to balance the benefits and risks of SCs.	10.1177/1461448221124007	
S. Luca, Clausen, M., Shaw, A., Lee, W. W., Krishnaswaji, S., Adi-Waaran, E., Faghfoury, H., Costain, G., Jobling, R., Aronson, M., Liston, E., Silver, J., Shuman, C., Chad, L., Hayeems, R. Z., Bombard, Y., Genetics Navigator Study Team	Finding the sweet spot: a qualitative study exploring patients' acceptability of chatbots in genetic service delivery	HUMAN GENETICS					BREAST-CANCER SUSCEPTIBILITY, COMPUTER-PROGRAM, HEALTH	Chatbots, web-based artificial intelligence tools that simulate human conversation, are increasingly in use to support many areas of genomic medicine. However, patient preferences towards using chatbots across the range of clinical settings are unknown. We conducted a qualitative study with individuals who underwent genetic testing for themselves or their child. Participants were asked about their preferences for using a chatbot within the genetic testing journey. Thematic analysis employing interpretive description was used. We interviewed 30 participants (67% female, 50% 50+ years). Participants considered chatbots to be inefficient for very simple tasks (e.g., answering FAQs) or very complex tasks (e.g., explaining results). Chatbots were acceptable for moderately complex tasks where participants perceived a favorable return on their investment of time and energy. In addition to achieving this "sweet spot," participants anticipated that their comfort with chatbots would increase if the chatbot was used as a complement to but not a replacement for usual care. Participants wanted a "safety net" (i.e., access to a clinician) for needs not addressed by the chatbot. This study provides timely insights into patients' comfort with and perceived limitations of chatbots for genomic medicine and can inform their implementation in practice.	10.1007/s00439-022-02512-2	
I. Mlakar, Verdonik, D., Majhenic, S., Rojc, M.	Understanding conversational interaction in multiparty conversations: the EVA Corpus	LANGUAGE RESOURCES AND EVALUATION					Corpora and language resources, Speech corpus, Multimodal corpus, Pragmatics, Conversational intelligence, DISCOURSE MARKERS, SPEECH CORPORA, LANGUAGE, GESTURES, ANNOTATION, SYSTEM	This paper focuses on gaining new knowledge through observation, qualitative analytics, and cross-modal fusion of rich multi-layered conversational features expressed during multiparty discourse. The outlined research stems from the theory that speech and co-speech gestures originate from the same representation; however, the representation is not solely limited to the speech production process. Thus, the nature of how information is conveyed by synchronously fusing speech and gestures must be investigated in detail. Therefore, this paper introduces an integrated annotation scheme and methodology which opens the opportunity to study verbal (i.e., speech) and non-verbal (i.e., visual cues with a communicative intent) components independently, however, still interconnected over a common timeline. To analyse this interaction between linguistic, paralinguistic, and non-verbal components in multiparty discourse and to help improve natural language generation in embodied conversational agents, a high-quality multimodal corpus, consisting of several annotation layers spanning syntax, POS, dialogue acts, discourse markers, sentiment, emotions, non-verbal behaviour, and gesture units was built and is represented in detail. It is the first of its kind for the Slovenian language. Moreover, detailed case studies show the tendency of metadiscourse to coincide with non-verbal behaviour of non-propositional origin. The case analysis further highlights how the newly created conversational model and the corresponding information-rich consistent corpus can be exploited to deepen the understanding of multiparty discourse.	10.1007/s10579-022-09627-y	
N. Mulla, Gharpure, P.	Automatic question generation: a review of methodologies, datasets, evaluation metrics, and applications	PROGRESS IN ARTIFICIAL INTELLIGENCE					Automatic question generation, Natural language generation, Natural language processing	Question generation in natural language has a wide variety of applications. It can be a helpful tool for chatbots for generating interesting questions as also for automating the process of question generation from a piece of text. Most modern-day systems, which are conversational, require question generation ability for identifying the user's needs and serving customers better. Generating questions in natural language is now, a more evolved task, which also includes generating questions for an image or video. In this review, we provide an overview of the research progress in automatic question generation. We also present a comprehensive literature review covering the classification of Question Generation systems by categorizing them into three broad use-cases, namely standalone question generation, visual question generation, and conversational question generation. We next discuss the datasets available for the same for each use-case. We further direct this review towards applications of question generation and discuss the challenges in this field of research.	10.1007/s13748-023-00295-9	
T. D. Osterreich, Anton, E., Schurr, J., Brehm, A., Teuteberg, F.	How can I help you? Design principles for task-oriented speech dialog systems in customer service	INFORMATION SYSTEMS AND E-BUSINESS MANAGEMENT					Speech dialog system, Conversational agent, Design science research, Design principles, Customer service, Experiment, SCIENCE RESEARCH, USER EXPERIENCE, SELF-DISCLOSURE, SOCIAL PRESENCE, METHODOLOGY, TECHNOLOGY, CHATBOTS, ANATOMY, AI	Organizations are increasingly delegating customer inquiries to speech dialog systems (SDSs) to save personnel resources. However, customers often report frustration when interacting with SDSs due to poorly designed solutions. Despite these issues, design knowledge for SDSs in customer service remains elusive. To address this research gap, we employ the design science approach and devise a design theory for SDSs in customer service. The design theory, including 14 requirements and five design principles, draws on the principles of dialog theory and undergoes validation in three iterations using five hypotheses. A summative evaluation comprising a two-phase experiment with 205 participants yields positive results regarding the user experience of the artifact. This study contributes to design knowledge for SDSs in customer service and supports practitioners striving to implement similar systems in their organizations.	10.1007/s10257-022-00570-7	

N. Patel, Nagpal, P., Shah, T., Sharma, A., Mahi, S., Lomax, D.	Improving mathematics assessment readability: Do large language models help?	JOURNAL OF COMPUTER ASSISTED LEARNING				GPT-3, mathematics assessment, readability, text simplification, STORY PROBLEMS, TEXT COMPREHENSIBILITY, CONCRETENESS, RECALL, RULES	Background/Readability metrics provide us with an objective and efficient way to assess the quality of educational texts. We can use the readability measures for finding assessment items that are difficult to read for a given grade level. Hard-to-read math word problems can put some students at a disadvantage if they are behind in their literacy learning. Despite their math abilities, these students can perform poorly on difficult-to-read word problems because of their poor reading skills. Less readable math tests can create equity issues for students who are relatively new to the language of assessment. Less readable test items can also affect the assessment's construct validity by partially measuring reading comprehension. Objectives/This study shows how large language models help us improve the readability of math assessment items. Methods/We analysed 250 test items from grades 3 to 5 of EngageNY, an open-source curriculum. We used the GPT-3 AI system to simplify the text of these math word problems. We used text prompts and the few-shot learning method for the simplification task. Results and Conclusions/On average, GPT-3 AI produced output passages that showed improvements in readability metrics, but the outputs had a large amount of noise and were often unrelated to the input. We used thresholds over text similarity metrics and changes in readability measures to filter out the noise. We found meaningful simplifications that can be given to item authors as suggestions for improvement. Takeaways/GPT-3 AI is capable of simplifying hard-to-read math word problems. The model generates noisy simplifications using text prompts or few-shot learning methods. The noise can be filtered using text similarity and readability measures. The meaningful simplifications AI produces are sound but not ready to be used as a direct replacement for the original items. To improve test quality, simplifications can be suggested to item authors at the time of digital question authoring.	10.1111/jcal.12776		
R. Pillai, Sivathanu, B., Metri, B., Kaushik, N.	Students' adoption of AI-based teacher-bots (T-bots) for learning in higher education	INFORMATION TECHNOLOGY & PEOPLE				T-bots, Mixed-method, Personalization, Interactivity, Anthropomorphism, TAM, Perceived intelligence, PLS-SEM, TECHNOLOGY ACCEPTANCE MODEL, MIXED METHODS RESEARCH, BIG DATA, INTENTION, ROBOTS, ANTECEDENTS, INFORMATION, CHATBOT	Purpose/The purpose of this paper is to investigate students' adoption intention (ADI) and actual usage (ATU) of artificial intelligence (AI)-based teacher bots (T-bots) for learning using technology adoption model (TAM) and context-specific variables. Design/methodology/approach A mixed-method design is used wherein the quantitative and qualitative approaches were used to explore the adoption of T-bots for learning. Overall, 45 principals/directors/deans/professors were interviewed and Nvivo 8.0 was used for interview data analysis. Overall, 1,380 students of higher education institutes were surveyed, and the collected data was analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. Findings/The T-bot's ADI's antecedents found were perceived ease of use, perceived usefulness, personalization, interactivity, perceived trust, anthropomorphism and perceived intelligence. The ADI influences the ATU of T-bots, and its relationship is negatively moderated by clickiness to learn from human teachers in the classroom. It comprehends the insights of senior authorities of the higher education institutions in India toward the adoption of T-bots. Practical implications/The research provides distinctive insights for principals, directors and professors in higher education institutes to understand the factors affecting the students' behavioral intention and use of T-bots. The developers and designers of T-bots need to ensure that T-bots are more interactive, provide personalized information and ensure the anthropomorphic characteristics of T-bots. The education policymakers can also comprehend the factors of T-bot adoption for developing the policies related to T-bots and their implications in education. Originality/value/T-bot is a new disruptive technology in the education sector, and this is the first step in exploring the adoption factors. The TAM model is extended with context-specific factors related to T-bot technology to offer a comprehensive explanatory power to the proposed model. The research outcome provides the unique antecedents of the adoption of T-bots.	10.1108/ITP-02-2021-0152		
A. Reboud, Harraondo, L., Usena, P., Troncy, R.	Stories of love and violence: zero-shot interesting events' classification for unsupervised TV series summarization	MULTIMEDIA SYSTEMS				Summarization, Moment detection, Zero-shot classification, Knowledge graphs, Face recognition	In this paper, we propose an unsupervised approach to generate TV series summaries using screenplays that are composed of dialogue and scenic textual descriptions. In the last years, the creation of large language models has enabled zero-shot text classification to perform effectively in some conditions. We explore if and how such models can be used for TV series summarization by conducting experiments with varying text inputs. Our main hypothesis being that interesting moments in narratives are related to the presence of interesting events, we choose candidate labels to be events representative of two genres (crime and soap opera) and we obtain competitive results with respect to the state-of-the-art baseline.	10.1007/s00530-022-01040-3		
K. Ryoung, Lee, D. H., Lee, J. G.	Chatbot's Complementary Motivation Support in Developing Study Plan of E-Learning English Lecture	INTERNATIONAL JOURNAL OF HUMAN-COMPUTER INTERACTION				SELF-DETERMINATION THEORY, PSYCHOLOGICAL NEED SATISFACTION, INTRINSIC MOTIVATION, EXTRINSIC MOTIVATION, STUDENTS MOTIVATION, AUTONOMY SUPPORT, TEACHERS, ORIENTATIONS, ATTRACTION, ENGAGEMENT	The present study investigates the effects of a chatbot's motivation support style on the learner's experience and intention to continue the study in the context of online English lectures. Seventy-nine undergraduate students were recruited from a large private university in Seoul, South Korea, and assigned to one of three learning plan development groups: develop a plan alone, autonomy support (i.e., a chatbot stimulating intrinsic motivation), or control support (i.e., a chatbot promoting extrinsic motivation) groups. The learners were classified into two groups based on their learning motivation types (i.e., intrinsic and extrinsic), and by doing so, the present study created a chatbot's matched and non-matched motivation support conditions in learning plan development. The two support strategies were compared with a control condition (i.e., learners' own plan making), and the results suggest that a chatbot with a non-matched motivation strategy increases learner self-efficacy, enjoyment, and intention to continue using the lecture. Furthermore, the study also explores the moderation effect of learning motivation types, and reveals that a chatbot's control support significantly improves the learning experience. The present study provides new insight into improving user evaluation by strategically differentiating a chatbot's conversational style and a user's characteristics.	10.1080/10447318.2022.2163786		
P. Sindhu, Bharti, K.	Influence of chatbots on purchase intention in social commerce	BEHAVIOUR & INFORMATION TECHNOLOGY				Chatbot, ingratiation, inspirational appeal, social commerce, social presence, ulterior motives, INFLUENCE TACTICS, PERSUASION KNOWLEDGE, BRAND ENGAGEMENT, SALESPERSON, CONSUMER, INFORMATION, PERCEPTIONS, TRUST, ORGANIZATIONS	The research investigates the effects of chatbot-delivered verbal (inspirational appeals) and non-verbal (ingratiation) cues on customers' purchase intentions on social commerce pages (study one). The research using a multi-method approach also investigates the role of social presence and ulterior motives in explaining the effects of the chatbot-delivered human-like cues on customers' purchase intentions (study two). Study one employs an experiment, followed by a structural equation model in study two. The results of study two enable the researchers to triangulate the results of study one and to understand the underlying causes of those results. The data was collected through an online experiment and an online survey for the two studies. The research reports that: (1) inspirational appeals delivered by chatbots positively influence purchase intentions; (2) ingratiation delivered using double-tap by chatbots does not significantly affect purchase intentions. The current research represents one of the first attempts to explore the influence of inspirational appeal and ingratiation delivered through chatbots on s-commerce purchase intentions. The findings of the study provide managerial insights to social commerce pages that could help engage customers and circumvent the attribution of ulterior motives while making a sale.	10.1080/0144929X.2022.2163188		
U. Tandon	Chatbots, virtual try-on (VTO), e-WOM: modeling the determinants of attitude and continued intention with PEEM as moderator in online shopping	GLOBAL KNOWLEDGE MEMORY AND COMMUNICATION				Chatbots, Online shopping, Virtual try-on technology, eWOM, Institutional mechanisms, Interactive communication, SELF-DETERMINATION, SOCIAL MEDIA, PERCEIVED EFFECTIVENESS, CUSTOMER SATISFACTION, IMPACT	Purpose/The purpose of this study is to develop an empirical model by understanding the relative significance of interactive technological forces, such as chatbots, virtual try-on technology (VTO) and e-word-of-mouth (e-WOM), to improve interactive marketing experiences among consumers. This study also validates the moderating role of the perceived effectiveness of e-commerce institutional mechanisms (PEEM) as a moderator between attitude and continued intention. Design/methodology/approach/Data were collected through personal visits and an online survey. The link to the survey questionnaire was shared on different social media platforms and social networking sites. A total of 362 responses obtained in the online and offline modes were considered for this study. Findings/e-WOM emerged as the strongest predictor of attitude, followed by chatbots and VTO. The results of this study revealed that PEEM did not moderate the relationship between attitude and continued intention. Originality/value/Using the self-determination theory and behavioral reasoning theory as theoretical frameworks, this study is an initial endeavor in the online shopping context to empirically validate interactive forces like chatbots, VTO, e-WOM and PEEM as moderators together to arrive at a holistic framework. These forces, in turn, act as significant contributors to online shopping satisfaction.	10.1108/GKMC-06-2022-0125		
Q. Xia, Chiu, T. K. F., Chai, C. S., Xie, K.	The mediating effects of needs satisfaction on the relationships between prior knowledge and self-regulated learning through artificial intelligence chatbot	BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY				artificial intelligence, K-12 education, prior knowledge, self-determination theory, self-regulated learning, MOTIVATION, STRATEGIES, AUTONOMY, RELATEDNESS, COMPETENCE, EQUATION, ENVIRONMENTS, ACHIEVEMENT, ACCEPTANCE, ENGAGEMENT	The anthropomorphic characteristics of artificial intelligence (AI) can provide a positive environment for self-regulated learning (SRL). The factors affecting adolescents' SRL through AI technologies remain unclear. Limited AI and disciplinary knowledge may affect the students' motivation, as explained by self-determination theory (SDT). In this study, we examine the mediating effects of needs satisfaction in SDT on the relationship between students' previous technical (AI) and disciplinary (English) knowledge and SRL, using an AI conversational chatbot. Data were collected from 323 9th Grade students through a questionnaire and a test. The students completed an AI basic unit and then learned English with a conversational chatbot for 5 days. Confidence intervals were calculated to investigate the mediating effects. We found that students' previous knowledge of English but not their AI knowledge directly affected their SRL with the chatbot, and that satisfying the need for autonomy and competence mediated the relationships between both knowledge (AI and English) and SRL, but relatedness did not. The self-directed nature of SRL requires heavy cognitive learning and satisfying the need for autonomy and competence may more effectively engage young children in this type of learning. The findings also revealed that current chatbot technologies may not benefit students with relatively lower levels of English proficiency. We suggest that teachers can use conversational chatbots for knowledge consolidation purposes, but not in SRL explorations. Practitioner notes/What is already known about this topic/Artificial intelligence (AI) technologies can potentially support students' self-regulated learning (SRL) of disciplinary knowledge through chatbots. Needs satisfaction in Self-determination theory (SDT) can explain the directive process required for SRL. Technical and disciplinary knowledge would affect SRL with technologies. What this paper adds/This study examines the mediating effects of needs satisfaction in SDT on the relationship between students' previous AI (technical) and English (disciplinary) knowledge and SRL, using an AI conversational chatbot. Students' previous knowledge of English but not their AI knowledge directly affected their SRL with the chatbot. Autonomy and competence were mediators, but relatedness was not. Implications for practice and/or policy/Teachers should use chatbots for knowledge consolidation rather than exploration. Teachers should support students' competence and autonomy, as these were found to be the factors that directly predicted SRL. School leaders and teacher educators should include the mediating effects of needs satisfaction in professional development programmes for digital education.	10.1111/bjjet.13305		
Q. Xia, Chiu, T. K. F., Chai, C. S.	The moderating effects of gender and need satisfaction on self-regulated learning through Artificial Intelligence (AI)	EDUCATION AND INFORMATION TECHNOLOGIES				Self-Regulated Learning, Self-Determination Theory, Artificial Intelligence, K-12 Education, AI Knowledge, Chatbot, TECHNOLOGY ACCEPTANCE, AUTONOMY SUPPORT, INFORMATION-TECHNOLOGY, MEDIATED COMMUNICATION, INTRINSIC MOTIVATION, USER ACCEPTANCE, STUDENTS, ENGAGEMENT, CHOICE, SCHOOL	Artificial Intelligence (AI) has the potential to support self-regulated learning (SRL) because of its strong anthropomorphic characteristics. However, most studies of AI in education have focused on cognitive outcomes in higher education, and little research has examined how psychological needs affect SRL with AI in the K-12 setting. SRL is a self-directed process driven by psychological factors that can be explained by the three basic needs of self-determination theory (SDT), i.e., autonomy, competence, and relatedness. This study fills a research gap by examining the moderating effects of need satisfaction and gender in predicting SRL among Grade 9 students. The results indicate that girls perceive more need support than boys. In predicting SRL, satisfaction of the need for autonomy and competence is moderated by both gender and AI knowledge, whereas satisfaction of the need for relatedness is moderated by gender only. Particularly among girls, the effects of autonomy and competence more strongly predict SRL when AI knowledge is low. These findings confirm the gender differences in need satisfaction when predicting SRL with a chatbot. The findings have implications for both teacher instruction and the design and development of intelligent learning environments.	10.1007/s10639-022-11547-x		
B. Zarouali, Araujo, T., Olmos, J., de Vreese, C.	Comparing Chatbots and Online Surveys for (Longitudinal) Data Collection: An Investigation of Response Characteristics, Data Quality, and User Evaluation	COMMUNICATION METHODS AND MEASURES				OPEN-ENDED QUESTIONS, CONVERSATIONAL AGENT, PERCEIVED SECURITY, NONRESPONSE RATES, COGNITIVE-LOAD, SURVEY MODE, WEB SURVEYS, R PACKAGE, RELIABILITY, TRUST	As chatbots are gaining more popularity than ever, they have recently been considered as interesting tools for survey administration in social science research. To explore this idea, we investigated the extent to which there are differences in response characteristics and data quality between a traditional, web-based survey and a conversational, chatbot-based survey (which we integrated in an instant messaging app). In addition, we zoomed into how respondents evaluate both survey modes. Using a longitudinal design, we also explored how response characteristics evolved over a period of two weeks. Overall, we did not find evidence that chatbots might be better survey administration tools than web surveys. On the contrary, the web survey often seemed to generate more favorable response characteristics and data quality. Finally, when it comes to user perceptions, we found that the chatbot survey was evaluated less favorably in terms of perceived enjoyment, usefulness, and security. Based on these results, we draw conclusions about whether chatbots can be considered as valid alternatives for traditional web survey methods.	10.1080/19312458.2022.2156489		
Y. Zhu, Zhang, R. T., Zou, Y. G., Jin, D.	Investigating customers' responses to artificial intelligence chatbots in online travel agencies: the moderating role of product familiarity	JOURNAL OF HOSPITALITY AND TOURISM TECHNOLOGY				Travel chatbot, Human-computer interaction, Information quality, SCR paradigm, Cognitive consistency theory, Tourism internet marketing, 777777, 7777, 777777, TRUST, INTENTION, TECHNOLOGY ACCEPTANCE, MODELS, RISK	Purpose/This paper aims to examine how consumers' perceptions of artificial intelligence (AI) chatbots influence individuals' cognitive and emotional states and their subsequent behavioral intentions vis-à-vis online travel agencies (OTAs). Design/methodology/approach/The survey sample comprised 566 customers who had experienced the use of travel AI chatbots in China using a combination of online and offline questionnaires. Partial least squares structural equation modeling was used to test the hypotheses. Findings/The results revealed that interaction and information quality, as AI chatbot stimuli, significantly increase potential tourists' trust and purchase intention. Perceived usefulness plays a mediating role in the relationship among interactivity, information quality, customer trust and purchase intention. Furthermore, the findings indicated that customers with high product familiarity exhibited greater trust in products demonstrating a high level of perceived usefulness. Originality/value/Integrating cognitive consistency theory, this study theoretically validates the applicability of the stimulus-organism-response framework on AI chatbots and provides academics with useful insights regarding the influence mechanisms of human-computer interaction and information quality on customer response within OTA settings.	10.1108/HTT-02-2022-0041		

M. McKillop, South, B. R., Preinerger, A., Mason, M., Jackson, G. P.	Leveraging conversational technology to answer common COVID-19 questions	Journal of the American Medical Informatics Association	2021	28	4	850-855	chatbot, article, conversation, coronavirus disease 2019, employer, government, health care utilization, human, medical information, organizational, pandemic, time factor	The rapidly evolving science about the Coronavirus Disease 2019 (COVID-19) pandemic created unprecedented health information needs and dramatic changes in policies globally. We describe a platform, Watson Assistant (WA), which has been used to develop conversational agents to deliver COVID-19 related information. We characterized the diverse use cases and implementations during the early pandemic and measured adoption through a number of users, messages sent, and conversational turns (ie, pairs of interactions between users and agents). Thirty-seven institutions in 9 countries deployed COVID-19 conversational agents with WA between March 30 and August 10, 2020, including 24 governmental agencies, 7 employers, 5 provider organizations, and 1 health plan. Over 6.8 million messages were delivered through the platform. The mean number of conversational turns per session ranged between 1.9 and 3.5. Our experience demonstrates that conversational technologies can be rapidly deployed for pandemic response and are adopted globally by a wide range of users.	10.1093/jamia/ocaa316	https://www.embase.com/search/results?subaction=viewrecord&id=L021644606&from-export,http://dx.doi.org/10.1093/jamia/ocaa316
	Legal Studies: Do androids dream of electric lawyers? The ethics of legal chatbots	Alternative Law Journal	2022	47	4	314			10.1177/1037969X221133273	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140975006&doi=10.1177%2F1037969X221133273&partnerID=40&md5=31ae10480da0b5034eac1fc5dbdb4cc
T. Adewumi, Lwicks, F., Lwicks, M.	Vector Representations of Idioms in Conversational Systems	Sci	2022	4	4		conversational systems, dialog systems, idioms, vector representation	In this study, we demonstrate that an open-domain conversational system trained on idioms or figurative language generates more fitting responses to prompts containing idioms. Idioms are a part of everyday speech in many languages and across many cultures, but they pose a great challenge for many natural language processing (NLP) systems that involve tasks such as information retrieval (IR), machine translation (MT), and conversational artificial intelligence (AI). We utilized the Potential Idiomatic Expression (PIE) English idiom corpus for the two tasks that we investigated: classification and conversation generation. We achieved a state-of-the-art (SoTA) result of a 98% macro F1 score on the classification task by using the SoTA T5 model. We experimented with three instances of the SoTA dialogue model—the Dialogue Generative Pre-trained Transformer (DialogPT)—for conversation generation. Their performances were evaluated by using the automatic metric, perplexity, and a human evaluation. The results showed that the model trained on the idiom corpus generated more fitting responses to prompts containing idioms 71.9% of the time in comparison with a similar model that was not trained on the idiom corpus. We have contributed the model checkpoint/demo/code to the HuggingFace hub for public access. © 2022 by the authors.	10.3390/sci4040037	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144681620&doi=10.3390%2Fsci4040037&partnerID=40&md5=81feb5544c92cd7b7bee3e30a84228d
F. Agbavor, Liang, H.	Artificial Intelligence-Enabled End-To-End Detection and Assessment of Alzheimer's Disease Using Voice	Brain Sci	2022	13	1		Alzheimer's disease, data2vec, dementia, end-to-end, large language models, speech and language	There is currently no simple, widely available screening method for Alzheimer's disease (AD), partly because the diagnosis of AD is complex and typically involves expensive and sometimes invasive tests not commonly available outside highly specialized clinical settings. Here, we developed an artificial intelligence (AI)-powered end-to-end system to detect AD and predict its severity directly from voice recordings. At the core of our system is the pre-trained data2vec model, the first high-performance self-supervised algorithm that works for speech, vision, and text. Our model was internally evaluated on the ADReSSo (Alzheimer's Dementia Recognition through Spontaneous Speech only) dataset containing voice recordings of subjects describing the Cookie Theft picture, and externally validated on a test dataset from DementiaBank. The AI model can detect AD with average area under the curve (AUC) of 0.846 and 0.835 on held-out and external test set, respectively. The model was well-calibrated (Hosmer-Lemeshow goodness-of-fit p-value = 0.9616). Moreover, the model can reliably predict the subject's cognitive testing score solely based on raw voice recordings. Our study demonstrates the feasibility of using the AI-powered end-to-end model for early AD diagnosis and severity prediction directly based on voice, showing its potential for screening Alzheimer's disease in a community setting.	10.3390/brainsci13010028	
S. Barykin, Mehta, R., Verghese, J., Mahajan, S., Boshuk, S., Kozlova, N., Vasilievna Kapustinova, I., Mikhaylov, A., Naumova, E., Dedyukhina, N.	Consumers' behavior in conversational commerce marketing based on messenger chatbots	F1000Research	2022	11			adult, article, artificial intelligence, chatbot, consumer, conversation, digital technology, female, human, human experiment, major clinical study, male, marketing, natural language processing, online shopping, organization, structural equation modeling, trust	Background: The increasing penetration of smartphones and the Internet in developing countries caused the rise of e-retail. Conversational commerce is highly increasing via interaction through messengers. To extract the benefits of both trends, companies have adopted messenger chatbots. These chatbots use Artificial intelligence and natural language processing to give responses to the customer and assist online shopping on the messenger interface. This research aims to discover the factors that affect the use of messenger chatbots and their influence on attitude and behavior intention. Methods: The research methodology includes the Technology Acceptance Model (TAM) with the variables of perceived usefulness, perceived ease of use, consumer trust, and anthropomorphism. The authors used an online survey for collecting the responses from 192 respondents and analyzed structural equation modeling. Results: Customer trust has shown the most decisive influence on customer attitude followed by Perceived Usefulness, Perceived Ease of Use. Also, the use of chatbots to make online shopping faster significantly affects the use of messenger chatbots for online shopping in the future. The authors explore various factors resulting in consumers' favor of accepting chatbots as an interface for m-commerce. Conclusions: The findings indicate that organizations should design strategies to improve interaction with the customer by developing messenger chatbots for more trusting conversations. Further research could include a theoretical digital marketing approach to conversational commerce based on anthropomorphic digital technologies.	10.12688/f1000research.122037.1	https://www.embase.com/search/results?subaction=viewrecord&id=L63944154&from-export,http://dx.doi.org/10.12688/f1000research.122037.1
N. Ben-Shabat, Sharvit, G., Meimis, B., Ben Jory, D., Stoma, A., Kiderman, D., Shabat, A., Tsar, A. M., Watari, A., Ament, H.	Assessing data gathering of chatbot-based symptom checkers - a clinical vignettes study	Int J Med Inform	2022	168		104897	Humans, "COVID-19/diagnosis/epidemiology, Pandemics, Quality of Health Care, Software, Artificial Intelligence, Chatbots, Computer-assisted diagnosis, Data-gathering, Diagnosis, Medical interview, Symptom checker, Telemedicine, Triage, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	BACKGROUND: The burden on healthcare systems is mounting continuously owing to population growth and aging, overuse of medical services, and the recent COVID-19 pandemic. This overburden is also causing reduced healthcare quality and outcomes. One solution gaining momentum is the integration of intelligent self-assessment tools, known as symptom-checkers, into healthcare-providers' systems. To the best of our knowledge, no study so far has investigated the data-gathering capabilities of these tools, which represent a crucial resource for simulating doctors' skills in medical-interviews. OBJECTIVES: The goal of this study was to evaluate the data-gathering function of currently available chatbot symptom-checkers. METHODS: We evaluated 8 symptom-checkers using 28 clinical vignettes from the repository of MSD-Manual case studies. The mean number of predefined pertinent findings for each case was 31.8 ± 6.8. The vignettes were entered into the platforms by 3 medical students who simulated the role of the patient. For each conversation, we obtained the number of pertinent findings retrieved and the number of questions asked. We then calculated the recall-rates (pertinent-findings retrieved out of all predefined pertinent-findings), and efficiency-rates (pertinent-findings retrieved out of the number of questions asked) of data-gathering, and compared them between the platforms. RESULTS: The overall recall rate for all symptom-checkers was 0.322(120/371) (0.26-0.31) for all pertinent findings, 0.37(111/292) (0.35-0.39) for present findings, and 0.28(114/412) (0.25-0.26) for absent findings. Among the symptom-checkers, Kahun platform had the highest recall rate with 0.51(450/889) (0.47-0.54). Out of 4,877 questions asked overall, 2,280 findings were gathered, yielding an efficiency rate of 0.46(95 %CI 0.45-0.48) across all platforms. Kahun was the most efficient tool 0.74 (95 %CI 0.70-0.77) without a statistically significant difference from Your.MD 0.69(95 %CI 0.65-0.73). CONCLUSION: The data-gathering performance of currently available symptom checkers is questionable. From among the tools available, Kahun demonstrated the best overall performance.	10.1016/j.jmedinf.2022.104897	
C. T. Berdahl, Hennem, A., Perwick, J. M., Zheng, K., Nuckolls, R. K.	Digital Tools Designed to Obtain the History of Present Illness From Patients: Scoping Review	Journal of Medical Internet Research	2022	24	11		caregiver, Clnahl, digital technology, electronic health record, Embase, health care quality, human, medical history, Medline, outcome assessment, patient information, peer review, PsycINFO, review, usability, Web of Science	Background: Many medical conditions, perhaps 80% of them, can be diagnosed by taking a thorough history of present illness (HPI). However, in the clinical setting, situations such as interruptions and time pressure may cause interactions with patients to be brief and fragmented. One solution for improving clinicians' ability to collect a thorough HPI and maximize efficiency and quality of care could be to use a digital tool to obtain the HPI before face-to-face evaluation by a clinician. Objective: Our objective was to identify and characterize digital tools that have been designed to obtain the HPI directly from patients or caregivers and present this information to clinicians before a face-to-face encounter. We also sought to describe outcomes reported in testing of these tools, especially those related to usability, efficiency, and quality of care. Methods: We conducted a scoping review using predefined search terms in the following databases: MEDLINE, CINAHL, PsycINFO, Web of Science, Embase, IEEE Xplore Digital Library, ACM Digital Library, and ProQuest Dissertations & Theses Global. Two reviewers screened titles and abstracts for relevance, performed full-text reviews of articles meeting the inclusion criteria, and used a pilot-sorting procedure to identify distinguishing characteristics of the tools. Information describing the tools was primarily obtained from identified peer-reviewed sources; in addition, supplementary information was obtained from tool websites and through direct communications with tool creators. Results: We identified 18 tools meeting the inclusion criteria. Of these 18 tools, 14 (78%) used primarily closed-ended and multiple-choice questions, 1 (6%) used free-text input, and 3 (17%) used conversational (chatbot) style. More than half (10/18, 56%) of the tools were tailored to specific patient subpopulations; the remaining (8/18, 44%) tools did not specify a target subpopulation. Of the 18 tools, 7 (39%) included multilingual support, and 12 (67%) had the capability to transfer data directly into the electronic health record. Studies of the tools reported on various outcome measures related to usability, efficiency, and quality of care. Conclusions: The HPI tools we identified (N=18) varied greatly in their purpose and functionality. There was no consensus on how patient-generated information should be collected or presented to clinicians. Existing tools have undergone inconsistent levels of testing, with a wide variety of different outcome measures used in evaluation, including some related to usability, efficiency, and quality of care. There is substantial interest in using digital tools to obtain the HPI from patients, but the outcomes measured have been inconsistent. Future research should focus on whether using HPI tools can lead to improved patient experience and health outcomes, although surrogate end points could instead be used so long as patient safety is monitored.	10.2196/36074	https://www.embase.com/search/results?subaction=viewrecord&id=L02195480&from-export,http://dx.doi.org/10.2196/36074
R. Bhagyalakshmi, Maria, E. F.	ARTIFICIAL INTELLIGENCE-BASED HRM TECHNOLOGICAL TOOLS, IN HRM DECISION	Journal of Pharmaceutical Negative Results	2022	13		937-946	article, artificial intelligence, employee, human, human experiment, language, manager, molecular recognition, robotics, software	Artificial intelligence plays an indispensable role in enabling human capabilities in understanding, reasoning, planning, communication, and perception. The automation of AI abilities creates new opportunities in Human Resource Development. Chatbot interfaces help in the multitasking process in HRM which includes shortlisting, interviews, and training programs. It reduces the burden of the HR manager as well as effectively uses the organization's resources efficiently. The present study highlights AI-enabled eHRM technologies application in various software companies in Chennai city. The sample is collected from employees working in the IT sectors using a convenient sampling method. The key focus of the study is on examining the AI-based HRM Technology Tools adopted by HR managers. The results show 12 AI-based HRM Technology Tools have been reduced into three dominant factors, namely Machine Language and Automation Factor (MLAF), Data Analytics and Acknowledgement Factor (DAAF), and Robotics and Bio Recognition Factor (RBRF). It has been observed that AI-based eHRM technology has been used in every process of recruitment.	10.47750/pnr.2022.13.510.106	https://www.embase.com/search/results?subaction=viewrecord&id=L0222618509&from-export,http://dx.doi.org/10.47750/pnr.2022.13.510.106
M. Biwas, Suri, J. S.	Deep learning and augmented radiology	Multimodality Imaging, Volume 1: Deep learning applications	2022			1.1-1.21		The effect of deep learning (DL) in today's world is nothing less than dramatic. From self-driving cars, to performing hazardous tasks on inhospitable terrain such as the seabed, to simple chatbots giving directions on a mobile phone, our daily lives have been affected. The cause of this massive development within very few years can be credited to the rapidly decreasing cost of hardware and the availability of open-source software. The healthcare industry is also adapting deep learning technologies to deliver fast and better services to patients. The volume of publications of DL applications in healthcare has exceeded all other domains, in particular in radiology, where one deals with medical images. In this respect, this chapter provides an introduction to DL for radiologists, scientists, academicians, etc. © IOP Publishing Ltd 2022. All rights reserved.		https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145428055&partnerID=40&md5=db06ddcd2a4d31bd3145af4fd821bb9
J. Blasco, Roig-Casasús, S., Igual-Camacho, C., Díaz-Díaz, B., Pérez-Malejki, J.	Conversational Chatbot to Promote Adherence to Rehabilitation After Total Knee Replacement: Implementation and Feasibility	Archives of Physical Medicine and Rehabilitation	2022	103	12	e125	adult, chatbot, clinical article, conference abstract, controlled study, education, exercise, feasibility study, female, follow up, home rehabilitation, hospital patient, human, male, natural language processing, outcome assessment, outpatient, physiotherapy, randomized controlled trial, rehabilitation, smartphone, total knee arthroplasty, university hospital, usability	Research Objectives: To design and implement a Chatbot that interacts with patients via instant messaging to supervise domiciliary rehabilitation and increase adherence. To conduct a feasibility study. Design: Pilot randomized trial (November 2021 to March 2022). Setting: Two university hospitals. Outpatient and domiciliary rehabilitation. Participants: 18 individuals, below 70, who underwent primary total knee replacement, had a personal smartphone, an instant messaging application installed, familiar with its use (≥2 accesses per week) and able to consent. Interventions: Patients underwent surgery and followed standard inpatient (≥2 days) and outpatient (≥2 to 4 weeks after surgery) physiotherapy care. The control group received one education session with recommended home exercises. The experimental group received the same education, but the domiciliary program was supervised via Chatbot, with automated interactions including messages to inform (e.g. about the disease, importance of compliance, progression), motivate, remind training days, and instruct the exercises up to 12 weeks' follow-up. Main Outcome Measures: Compliance (primary), system usability, feasibility (recruitment and retention rates) and safety. Results: Compliance was 15% higher in the experimental group, with n=7 (78%) participants classified as 'achieved adherence' (>80% of sessions). As for feasibility, recruitment rate was good but lower than expected (75% of invited agreed); retention was good (>85%). Overall, the users reported that the tool was easy to use; however, some users (n=2) reported the need to learn how to use it, and one did not perform any access or interaction. Conclusions: A Chatbot that communicates via instant messaging service has been successfully developed. The preliminary assessment suggests that the tool may be useful to increase compliance with in-home rehabilitation, and warrants a randomized clinical trial to determine the clinical impact. Author(s) Disclosures: This result is part of the project PID2020-115825RA-I00, funded and supported by MCIN/AEI/10.13039/501100011033, convocatoria Proyectos I+D+I 2020 - Modalidades "Retos Investigación" y "Generación de Conocimiento" (PID2020). The funder played no role on the design or results of this work.	10.1016/j.apmr.2022.08.764	https://www.embase.com/search/results?subaction=viewrecord&id=L02213042918&from-export,http://dx.doi.org/10.1016/j.apmr.2022.08.764

Carmichael, Poirier, S. M., Coursaris, C. K., Leger, P. M., Senecal, S.	Users' Information Disclosure Behaviors during Interactions with Chatbots: The Effect of Information Disclosure Nudges	APPLIED SCIENCES-BASEL	2022	12	24	chatbot, information disclosure, information disclosure nudge, emotional response, privacy, human-chatbot interaction, SELF-DISCLOSURE, E-COMMERCE, PRIVACY NOTICES, ONLINE, MODEL, PARADOX, PRODUCT, PERSONALIZATION, MACHINES, INTERNET	Drawing from the tension between a company's desire for customer information to tailor experiences and a consumer's need for privacy, this study aims to test the effect of two information disclosure nudges on users' information disclosure behaviors. Whereas previous literature on user-chatbot interaction focused on encouraging and increasing users' disclosures, this study introduces measures that make users conscious of their disclosure behaviors to low and high-sensitivity questions asked by chatbots. A within-subjects laboratory experiment entailed 19 participants interacting with chatbots, responding to pre-tested questions of varying sensitivity while being presented with different information disclosure nudges. The results suggest that question sensitivity negatively impacts users' information disclosures to chatbots. Moreover, this study suggests that adding a sensitivity signal-presenting the level of sensitivity of the question asked by the chatbot-influences users' information disclosure behaviors. Finally, the theoretical contributions and managerial implications of the results are discussed.	10.3390/app122412660		
D. Castelvecchi	Are ChatGPT and AlphaCode going to replace programmers?	Nature	2022			Machine learning, Mathematics and computing		10.1038/d41586-022-04383-z		
E. Castilla, Escobar, J. I., Villalonga, C., Banos, O.	HIGEA: An Intelligent Conversational Agent to Detect Caregiver Burden	International Journal of Environmental Research and Public Health	2022	19	23	chatbot, mobile health application, article, attitude assessment, caregiver, caregiver burden, digital technology, human, interpersonal communication, medical literature, mental disease, mental health, preliminary data, process technology, program evaluation, proof of concept, protocol compliance, psychologic test, psychological well-being, social media	Mental health disorders increasingly affect people worldwide. As a consequence, more families and relatives find themselves acting as caregivers. Most often, these are untrained people who experience loneliness, abandonment, and often develop signs of depression (i.e., caregiver burden syndrome). In this work, we present HIGEA, a digital system based on a conversational agent to help to detect caregiver burden. The conversational agent naturally embeds psychological test questions into informal conversations, which aim at increasing the adherence of use and avoiding user bias. A proof-of-concept is developed based on the popular Zarit Test, which is widely used to assess caregiver burden. Preliminary results show the system is useful and effective.	10.3390/ijerph192316019	https://www.embase.com/search/results?subaction=viewrecord&id=12020530268&from=export , http://dx.doi.org/10.3390/ijerph192316019	
L. S. Castro, Baracas, L., Hashikoa, G., Bonadio, C., Hachul, H., Santos-Silva, R., Poyares, D.	REAL WORLD EFFICACY OF A MULTICOMPONENT CBT PROGRAM WITH CHATBOT AND AI	SLEEP MEDICINE	2022	100		S135-S135				
E. S. Chen, Zhao, H., Li, B., Zhu, X. P., Wang, H. Q., Wang, S.	Affective feature knowledge interaction for empathetic conversation generation	CONNECTION SCIENCE	2022	34	1	2559-2576	Emotional features, emotional lexicon, commonsense knowledge, EmpatheticDialogues dataset, empathetic conversation generation	A popular chatbot can generate natural and human-like responses, and the crucial technology is the ability to understand and appreciate the emotions and demands expressed from the perspective of the user. However, some empathetic dialogue generation models only specialize in commonsense and neglect emotion, which can only get a one-sided understanding of the user's situation and makes the model unable to express emotion better. In this paper, we propose a novel affective feature knowledge interactive model named AFKI, to enhance response generation performance, which enriches conversation history to obtain emotional interactive context by leveraging fine-grained emotional features and commonsense knowledge. Furthermore, we utilise an emotional interactive context encoder to learn higher-level affective interaction information and distill the emotional state feature to guide the empathetic response generation. The emotional features are to well capture the subtle differences of the user's emotional expression, and the commonsense knowledge improves the representation of affective information on generated responses. Extensive experiments on the empathetic conversation task demonstrate that our model generates multiple responses with higher emotion accuracy and stronger empathetic ability compared with baseline model approaches for empathetic response generation.	10.1080/09540091.2022.2134301	
D. K. Chhadi, Patel, D.	Artificial Intelligence Versus Conventional orthosis	Journal of Pharmaceutical Negative Results	2022	13		2899-2901	foot orthosis, hip-knee-ankle-foot orthosis, article, artificial intelligence, autonomous vehicle, clinical practice, comparative study, feedback system, health care, health data, human, intestine endoscopy, patient coding, pattern recognition, physiotherapist, physiotherapy, rehabilitation medicine, speech discrimination, sports medicine	We've witnessed remarkable development in the domains of robotics and artificial intelligence during the previous decade. Innovators have been looking for methods to merge people and robots, and in certain cases, to eliminate humans entirely. We're seeing delivery drones, security robots, and other robotics applications. Chatbots, self-driving cars, and speech recognition have all made important advances in AI. Perhaps most importantly, advancements in artificial intelligence and robotic technology in health care are boosting patient treatment and care. Physical therapy is one field that is making use of both technologies, with a special emphasis on those who have movement difficulties as a result of neurological damage.	10.47750/pnr.2022.13.506.376	https://www.embase.com/search/results?subaction=viewrecord&id=12021831738&from=export , http://dx.doi.org/10.47750/pnr.2022.13.506.376
T. Ciecierski-Holmes, Singh, R., Ast, M., Brenner, S., Bartelt, S.	Artificial intelligence for strengthening healthcare systems in low- and middle-income countries: a systematic scoping review	npj Digital Medicine	2022	5	1		Cost effectiveness, Decision support systems, Health care, Search engines, AI Technologies, Applications of AI, Global health, Grey literature, Healthcare systems, Literature search, Low income countries, Middle income countries, Scoping review, Search terms, Artificial intelligence, algorithm, clinical decision support system, coronavirus disease 2019, cost control, cost effectiveness analysis, diagnosis time, emotional support, health care system, human, low income country, middle income country, reliability, reverse transcription polymerase chain reaction, Review, self evaluation, thorax radiography, time to treatment, treatment planning, tuberculosis	In low- and middle-income countries (LMICs), AI has been promoted as a potential means of strengthening healthcare systems by a growing number of publications. We aimed to evaluate the scope and nature of AI technologies in the specific context of LMICs. In this systematic scoping review, we used a broad variety of AI and healthcare search terms. Our literature search included records published between 1st January 2009 and 30th September 2021 from the Scopus, EMBASE, MEDLINE, Global Health and APA Psycinfo databases, and grey literature from a Google Scholar search. We included studies that reported a quantitative and/or qualitative evaluation of a real-world application of AI in an LMIC health context. A total of 10 references evaluating the application of AI in an LMIC were included. Applications varied widely, including: clinical decision support systems, treatment planning and triage assistants and health chatbots. Only half of the papers reported which algorithms and datasets were used in order to train the AI. A number of challenges of using AI tools were reported, including issues with reliability, mixed impacts on workflows, poor user friendliness and lack of adeptness with local contexts. Many barriers exist that prevent the successful development and adoption of well-performing, context-specific AI tools, such as limited data availability, trust and evidence of cost-effectiveness in LMICs. Additional evaluations of the use of AI in healthcare in LMICs are needed in order to identify their effectiveness and reliability in real-world settings and to generate understanding for best practices for future implementations. © 2022, The Author(s).	10.1038/s41746-022-00700-y	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140788377&doi=10.1038%2F41746-022-00700-y&partnerID=40&md5=2eb00ea27167ac401dfe1fa31ea191ab
C. Clavel, Labeau, M., Cassel, J.	Socio-conversational systems: Three challenges at the crossroads of fields	Front Robot AI	2022	9		937825	Affective computing, Machine learning, Multimodality, Natural language processing, Social signal processing, Socio-conversational systems, commercial or financial relationships that could be construed as a potential, conflict of interest.	Socio-conversational systems are dialogue systems, including what are sometimes referred to as chatbots, vocal assistants, social robots, and embodied conversational agents, that are capable of interacting with humans in a way that treats both the specifically social nature of the interaction and the content of a task. The aim of this paper is twofold: 1) to uncover some places where the compartmentalized nature of research conducted around socio-conversational systems creates problems for the field as a whole, and 2) to propose a way to overcome this compartmentalization and thus strengthen the capabilities of socio-conversational systems by defining common challenges. Specifically, we examine research carried out by the signal processing, natural language processing and dialogue, machine/deep learning, social/affective computing and social sciences communities. We focus on three major challenges for the development of effective socio-conversational systems, and describe ways to tackle them.	10.3389/frobt.2022.937825	
R. Corr	Do androids dream of electric lawyers? The ethics of legal chatbots	ALTERNATIVE LAW JOURNAL	2022	47	4	314-314		10.1177/1037969X221133273		
A. Dahmen, Keller, F. M., Derksen, C., Rinn, R., Becker, P., Lipkpe, S.	Screening and assessment for post-acute COVID-19 syndrome (PACS), guidance by personal pilots and support with individual digital trainings within intersectoral care: a study protocol of a randomized controlled trial	BMC Infectious Diseases	2022	22	1		Cross-sectoral care, Digital therapy offers, Interdisciplinary diagnostic, Long-COVID, Low-threshold screening, Medical rehabilitation, Post-acute COVID-19 syndrome, Post-COVID, Symptom assessment, adult, airplane pilot, Article, controlled study, coronavirus disease 2019, cross-sectional study, evaluation study, feasibility study, health program, health service, human, long COVID, longitudinal study, major clinical study, mass screening, mental function, patient care, physiology, propensity score, randomized controlled trial, rehabilitation, training, treatment planning, complication, randomized controlled trial (topic), treatment outcome, COVID-19, Humans, Randomized Controlled Trials as Topic	Background: Because the clinical patterns and symptoms that persist after a COVID-19 infection are diverse, a diagnosis of post-acute COVID-19 syndrome (PACS) is difficult to implement. The current research project therefore aims to evaluate the feasibility and the practicability of a comprehensive, interdisciplinary, and cross-sectoral treatment program consisting of a low-threshold online screening and holistic assessment for PACS. Furthermore, it aims to evaluate digital interventions and the use of so-called personal guides that may help to facilitate the recovery of PACS. Methods: This German study consists of a low-threshold online screening for PACS where positively screened participants will be supported throughout by personal pilots. The personal pilots are aimed at empowering patients and helping them to navigate through the study and different treatment options. Patients will then be randomly assigned either to an intervention group (IG) or an active control group (ACG). The IG will receive a comprehensive assessment of physiological and psychological functioning to inform future treatment. The ACG does not receive the assessment but both groups will receive a treatment consisting of an individual digital treatment program (digital intervention platform and an intervention via a chatbot). This digital intervention is based on the needs identified during the assessment for participants in the IG. Compared to that, the ACG will receive a more common digital treatment program aiming to reduce PACS symptoms. Importantly, a third comparison group (CompG) will be recruited that does not receive any treatment. A propensity score matching will take place, ensuring comparability between the participants. Primary endpoints of the study are symptom reduction and return to work. Secondary outcomes comprise, for example, social participation and activities in daily life. Furthermore, the feasibility and applicability of the online screening tool, the holistic assessment, digital trainings, and personal pilots will be evaluated. Discussion: This is one of the first large-scale studies to improve the diagnosis and the care of patients with PACS by means of empowerment. It is to be evaluated whether the methods utilized can be used for the German and international population. Trial registration ClinicalTrials.gov Identifier: NCT05238415; date of registration: February 14, 2022 © 2022, The Author(s).	10.1186/s12879-022-07584-z	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8515979404&doi=10.1186%2F12879-022-07584-z&partnerID=40&md5=1488a2eb517aaf122b61a53021df82a
A. De la Rosa-Gómez, Waldherr, K.	Editorial: Highlights in digital mental health 2021/22	Front Digit Health	2022	4		1093375	Covid-19, chatbot, depression, engagement, meta-analysis, older adults, social isolation, telemental health (TMH), commercial or financial relationships that could be construed as a potential, conflict of interest.	10.3389/dgth.2022.1093375		

C. Diamond, Rundle, C. W., Albrecht, J. M., Nicholas, M. W.	Chatbot utilization in dermatology: a potential amelioration to burnout in dermatology	Dermatology Online Journal	2022	28	6	chatbot, artificial intelligence, automation, dermatologist, dermatology, electronic medical record, evaluation study, follow up, letter, medication compliance, patient care, patient education, personal experience, professional burnout, social media, software, technology, workflow	10.5070/D328659734	https://www.embase.com/search/results?subaction=viewrecord&id=L2022260514&from=export,http://dx.doi.org/10.5070/D328659734
I. Donatello, Dragoni, M.	AI-enabled persuasive personal health assistant	Social Network Analysis and Mining	2022	12	1	eHealth, Knowledge-based systems, Logical reasoning, mHealth, Natural language generation, Ontologies, Persuasive systems, Data handling, Diseases, Natural language processing systems, User profile, Behavioral changes, Chronic disease, Healthy lifestyles, Ontology's Personal health, Persuasive system, Knowledge based systems	10.1007/13278-022-00935-3	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85135603752&doi=10.1007/2f13278-022-00935-3&partnerID=40&md5=83893044e916943521f26668575149f
G. A. Entenberg, Dosovitsky, G., Aghakhani, S., Mostovoy, K., Carre, N., Marshall, Z., Benfida, O., Mizrahi, S., Testerman, A., Rousseau, A., Lin, G., Bunge, E. L.	User experience with a parenting chatbot micro intervention	Front Digit Health	2022	4	989022	artificial intelligence, chatbot, conversational agent, intervention, parenting, user experience (UX), commercial or financial relationships that could be construed as a potential, conflict of interest.	10.3389/dgth.2022.989022	BACKGROUND: The use of chatbots to address mental health conditions have become increasingly popular in recent years. However, few studies aimed to teach parenting skills through chatbots, and there are no reports on parental user experience. Aim: This study aimed to assess the user experience of a parenting chatbot micro intervention to teach how to praise children in a Spanish-speaking country. METHODS: A sample of 89 parents were assigned to the chatbot micro intervention as part of a randomized controlled trial study. Completion rates, engagement, satisfaction, net promoter score, and acceptability were analyzed. RESULTS: 66.3% of the participants completed the intervention. Participants exchanged an average of 49.8 messages (SD = 1.53), provided an average satisfaction score of 4.19 (SD = .79), and reported that they would recommend the chatbot to other parents [net promoter score = 4.63/5; SD = .66]. Acceptability level was high (ease of use = 4.66 [SD = .73], comfortability = 4.72 [SD = .45], lack of technical problems = 4.69 [SD = .59], interactivity = 4.51 [SD = .77], usefulness for everyday life = 4.75 [SD = .54]). CONCLUSIONS: Overall, users completed the intervention at a high rate, engaged with the chatbot, were satisfied, would recommend it to others, and reported a high level of acceptability. Chatbots have the potential to teach parenting skills however research on the efficacy of parenting chatbot interventions is needed.
H. B. Essel, Vlachopoulos, D., Tache-Menson, A., Johnson, E. E., Baah, P. K.	The impact of a virtual teaching assistant (chatbot) on students' learning in Ghanaian higher education	International Journal of Educational Technology in Higher Education	2022	19	1	Artificial intelligence, Ghanaian higher education, Student-instructor interaction, Virtual teaching assistants, Zero-coding chatbot	10.1186/s41239-022-00362-6	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8514946833&doi=10.1186%2F41239-022-00362-6&partnerID=40&md5=f04d8b9edda6cd04d4f150731e4dff
J. Fardouly, Ersoy, R. D., Sukumaran, S.	Potential benefits and limitations of machine learning in the field of eating disorders: current research and future directions	Journal of Eating Disorders	2022	10	1	Artificial learning, Chatbot, Detection, Eating disorder, Ethical concerns, Machine learning, Social media, Statistics, Treatment	10.1186/s40337-022-00581-2	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85129571216&doi=10.1186%2F40337-022-00581-2&partnerID=40&md5=d59cac1671713491340772df8945b41
M. Fidan, Gencel, N.	Supporting the Instructional Videos With Chatbot and Peer Feedback Mechanisms in Online Learning: The Effects on Learning Performance and Intrinsic Motivation	Journal of Educational Computing Research	2022	60	7 1716-1741	artificial intelligence, chatbot, feedback, intrinsic motivation, online learning, peer feedback, teacher education, video-based learning	10.1177/0735631221077901	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85124826987&doi=10.1177%2F0735631221077901&partnerID=40&md5=eb5ab4494996965b4574383bc318f
I. Fierman, Zia, G., Loria, A., Janzon, S., Hurmut, M., Van Velsen, L., Fard, B., Del Signore, S., Del Signore, S.	Social Robots as a Friendly Interface for Older Patients participating to Clinical Trials	European Geriatric Medicine	2022	13	5336-5337	aged, chatbot, conference abstract, controlled study, conversation, coronavirus disease 2019, exercise, human, nonhuman, nurse, outcome assessment, pandemic, pepper, rehabilitation, rehabilitation center, robot, robotics, tablet computer, technology, usability, workload	10.1007/s41999-022-00711-8	https://www.embase.com/search/results?subaction=viewrecord&id=L639930712&from=export,http://dx.doi.org/10.1007/s41999-022-00711-8
C. A. Gao, Howard, F. M., Markov, N. S., Dyer, E. C., Ramesh, S., Luo, Y., Pearson, A. T.	Comparing scientific abstracts generated by ChatGPT to original abstracts using an artificial intelligence output detector, plagiarism detector, and blinded human reviewers		2022		(Gao C.A., Catherine e.gao@northwestern.stern.edu; Markov N.S.) Division of Pulmonary and Critical Care, Department of Medicine, Northwestern University, United States	adult, artificial intelligence, clinical article, cohort analysis, controlled study, female, human, human experiment, language, male, plagiarism, probability, receiver operating characteristic, writing	10.1101/2022.12.23.521610	https://www.embase.com/search/results?subaction=viewrecord&id=L639930712&from=export,http://dx.doi.org/10.1101/2022.12.23.521610

Gilson, A.; Safranek, C.; Huang, T.; Socrates, V.; Ch, L.; Taylor, R. A.; Chartash, D.	How Does ChatGPT Perform on the Medical Licensing Exams? The Implications of Large Language Models for Medical Education and Knowledge Assessment		2022		(Gilson A.; Safranek C.; Socrates V.; Ch L.; Taylor R.A.; Chartash D.; david.ch artash@yale.edu)Section for Biomedical Informatics and Data Science, Yale University School of	artificial intelligence, chatbot, controlled study, coroner, education, human, human experiment, licensing, medical education, medical student, multiple choice test, natural language processing, reasoning	Background: ChatGPT is a 175 billion parameter natural language processing model which can generate conversation style responses to user input. Objective: To evaluate the performance of ChatGPT on questions within the scope of United States Medical Licensing Examination (USMLE) Step 1 and Step 2 exams, as well as analyzer responses for user interpretability. Methods: We used two novel sets of multiple choice questions to evaluate ChatGPT's performance, each with questions pertaining to Step 1 and Step 2. The first was derived from AMBOSS, a commonly used question bank for medical students, which also provides statistics on question difficulty and the performance on an exam relative to the userbase. The second, was the National Board of Medical Examiners (NBME) Free 120-question exams. After prompting ChatGPT with each question, ChatGPT's selected answer was recorded, and the text output evaluated across three qualitative metrics: logical justification of the answer selected, presence of information internal to the question, and presence of information external to the question. Results: On the four datasets, AMBOSS-Step1, AMBOSS-Step2, NBME-Free-Step1, and NBME-Free-Step2, ChatGPT achieved accuracies of 44%, 42%, 64.4%, and 57.8%. The model demonstrated a significant decrease in performance as question difficulty increased ($P=0.12$) within the AMBOSSstep1 dataset. We found logical justification for ChatGPT's answer selection was present in 100% of outputs. Internal information to the question was present in >90% of all questions. The presence of information external to the question was respectively 54.5% and 27% lower for incorrect relative to correct answers on the NBME-Free-Step1 and NBME-Free-Step2 datasets ($P<0.01$). Conclusion: ChatGPT marks a significant improvement in natural language processing models on the tasks of medical question answering. By performing at greater than 60% threshold on the NBME-Free-Step-1 dataset we show that the model is comparable to a third year medical student. Additionally, due to the dialogic nature of the response to questions, we demonstrate ChatGPT's ability to provide reasoning and informational context across the majority of answers. These facts taken together make a compelling case for the potential applications of ChatGPT as a medical education tool.	10.1101/2022.12.23.22283901	https://www.embase.com/search/results?subaction=viewrecord&id=L2022075781&from=export,http://dx.doi.org/10.1101/2022.12.23.22283901
L. Gkinio, Elbanna, A.	Hope, tolerance and empathy: employees' emotions when using an AI-enabled chatbot in a digitalised workplace	Information Technology and People	2022	35	6 1714-1743	AI use, Artificial intelligence, Chatbot, Digital transformation, Digital ways of working, Digital workplace, Emotions, Emotions at work, Future of work, Technology use	Purpose: Information Systems research on emotions in relation to using technology largely holds essentialist assumptions about emotions, focuses on negative emotions and treats technology as a token or as a black box, which hinders an in-depth understanding of distinctions in the emotional experience of using artificial intelligence (AI) technology in context. This research focuses on understanding employees' emotional experiences of using an AI chatbot as a specific type of AI system that learns from how it is used and is conversational, displaying a social presence to users. The research questions how and why employees experience emotions when using an AI chatbot, and how these emotions impact its use. Design/methodology/approach: An interpretive case study approach and an inductive analysis were adopted for this study. Data were collected through interviews, documents review and observation of use. Findings: The study found that employee appraisals of chatbots were influenced by the form and functional design of the AI chatbot technology and its organisational and social context, resulting in a wider repertoire of appraisals and multiple emotions. In addition to positive and negative emotions, users experienced connection emotions. The findings show that the existence of multiple emotions can encourage continued use of an AI chatbot. Originality/value: This research extends information systems literature on emotions by focusing on the lived experiences of employees in their actual use of an AI chatbot, while considering its characteristics and its organisational and social context. The findings inform the emerging literature on AI. © 2022, Lorenta Gkinio and Amay Elbanna.	10.1108/ITP-04-2021-0328	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85130033275&doi=10.1108/ITP-04-2021-0328&partnerID=40&md5=601bf65d07bd3890bb2f07766406f51
U. Gnewuch, Morana, S., Adam, M. T., P., Maedche, A.	Opposing Effects of Response Time in Human-Chatbot Interaction: The Moderating Role of Prior Experience	Business and Information Systems Engineering	2022	64	6 773-791	Chatbot, Expectancy violations theory, Lab experiment, Prior experience, Response delay, Response time, Social response theory	Research has shown that employing social cues (e.g., name, human-like avatar) in chatbot design enhances users' social presence perceptions and their chatbot usage intentions. However, the picture is less clear for the social cue of chatbot response time. While some researchers argue that instant responses make chatbots appear unhuman-like, others suggest that delayed responses are perceived less positively. Drawing on social response theory and expectancy violations theory, this study investigates whether users' prior experience with chatbots clarifies the inconsistencies in the literature. In a lab experiment ($N = 202$), participants interacted with a chatbot that responded either instantly or with a delay. The results reveal that a delayed response time has opposing effects on social presence and usage intentions and shed light on the differences between novice users and experienced users – that is, those who have not interacted with a chatbot before vs. those who have. This study contributes to information systems literature by identifying prior experience as a key moderating factor that shapes users' social responses to chatbots and by reconciling inconsistencies in the literature regarding the role of chatbot response time. For practitioners, this study points out a drawback of the widely adopted "one-design-fits-all" approach to chatbot design. © 2022, The Author(s).	10.1007/s12599-022-00755-x	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85131073484&doi=10.1007/s12599-022-00755-x&partnerID=40&md5=7a0012d619e72e3dc239aae9a1e41a1
F. Graham	Daily briefing: Will ChatGPT kill the essay assignment?	Nature	2022					10.1038/d41586-022-04437-2	
A. Grinbaum, Adomaitis, L.	Moral Equivalence in the Metaverse	NanoEthics	2022	16	3 257-270	Affective computing, Artificial intelligence, Chatbot, Ethics, Extended reality, Virtual reality	Are digital subjects in virtual reality morally equivalent to human subjects? We divide this problem into two questions bearing, respectively, on cognitive and emotional equivalence. Typically, cognitive equivalence does not hold due to the lack of substantialist indistinguishability, but emotional equivalence applies: digital subjects endowed with face or language elicit emotional responses on a par with real-world pleasure, desire, horror, or fear. This is sufficient for projecting moral traits on avatars in the metaverse or on dialog systems based on large language models. Our main case study is a chatbot trained on the chat history between a Canadian man and his deceased fiancée. To demonstrate emotional equivalence and the mechanism of moral transfer, we compare digital devices with the functioning of oracles in a story by Plutarch and in a narrative that draws on the book of Genesis. Finally, we note that, along with the projections of ethical issues, humans also tend to bring real-world solutions of moral conundrums into extended reality. We argue that the lack of cognitive equivalence makes such projections problematic as they lead to overpolicing and a sanitized metaverse. © 2022, The Author(s), under exclusive licence to Springer Nature B.V.	10.1007/s11569-022-00426-x	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142146913&doi=10.1007/s11569-022-00426-x&partnerID=40&md5=73493c87a4809c21c15a6b78e14f34b
Y. Guo, Wang, J., Wu, R., U., Z., Sun, L.	Designing for trust: a set of design principles to increase trust in chatbot	CCF Transactions on Pervasive Computing and Interaction	2022	4	4 474-481	Chatbot, Conversational interaction, Design principles, Design semantics, Positive emotions, Trust, Natural language processing systems, Chatbots, Conversational agents, High-tech products, Natural languages, Users' acceptance, Semantics	Trust is an important factor influencing user acceptance of high-tech products. As the artificial intelligence and natural language processing develop, all kinds of conversational agents (chatbot) have appeared around us. These chatbots are able to provide people with convenient services such as ordering food, stock recommendations, fund diagnostics. However, it is still not clear how to make users feel chatbot trustworthy. In this study, we aimed to explore a set of design principles to build trust between users and conversational agents. Based on extensive research on trust, we proposed five design semantics and 10 design principles, and verified their effectiveness through experiments. The result of experiment suggest that our design principles can improve users' trust towards chatbot, thus provided guidance and suggestions for designing more trustworthy chatbots in the future. © 2022, China Computer Federation (CCF).	10.1007/42486-022-00106-5	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85130436686&doi=10.1007/42486-022-00106-5&partnerID=40&md5=8b61c305bea0672b914423623ee66f61
S. Gupta, Chen, Y.	Supporting Inclusive Learning Using Chatbots? A Chatbot-Led Instructional Design	Journal of Information Systems Education	2022	33	1 98-108	Artificial intelligence, Chatbot, Inclusive learning, Is education, Learning, Artificial intelligence agent, Chatbots, Conversational agents, Experimental platform, High educations, Interview study, IS educations, Teachers', Students	Supporting student academic success has been one of the major goals for higher education. However, low teacher-to-student ratio makes it difficult for students to receive sufficient and personalized support that they might want to. The advancement of artificial intelligence (AI) and conversational agents, such as chatbots, has provided opportunities for assisting learning for different types of students. This research aims at investigating the opportunities and requirements of chatbots as an intelligent helper to facilitate equity in learning. We developed a chatbot as an experimental platform to investigate the design opportunities of using chatbots to support inclusive learning. Through a chatbot-led user study with 215 undergraduate students, we found chatbots provide the opportunity to support students who are disadvantaged, with diverse life environments, and with varied learning styles. This could be achieved through an accessible, interactive, and confidential way © 2022. Journal of Information Systems Education.All Rights Reserved.	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85125075350&partnerID=40&md5=5f65d662d8d1a78ab03f1e536b0f056	
J. W. Han, Park, J., Lee, H.	Analysis of the effect of an artificial intelligence chatbot educational program on non-face-to-face classes: a quasi-experimental study	BMC Med Educ	2022	22	1 830	Humans, Artificial Intelligence, "COVID-19(epidemiology, Pandemics, Learning", "Students, Nursing, Chatbot program, Clinical reasoning, Data processing, Education, Nursing	BACKGROUND: Education and training are needed for nursing students using artificial intelligence-based educational programs. However, few studies have assessed the effect of using chatbots in nursing education. OBJECTIVES: This study aimed to develop and examine the effect of an artificial intelligence chatbot educational program for promoting nursing skills related to electronic fetal monitoring in nursing college students during non-face-to-face classes during the COVID-19 pandemic. DESIGN: This quasi-experimental study used a nonequivalent control group non-synchronized pretest-posttest design. METHODS: The participants were 61 junior students from a nursing college located in G province of South Korea. Data were collected between November 3 and 16, 2021, and analyzed using independent t-tests. RESULTS: The experimental group in which the artificial intelligence chatbot program was applied did not show statistically significant differences in knowledge ($t = -0.58, p = .567$), clinical reasoning competency ($t = 0.75, p = .455$), confidence ($t = 1.13, p = .264$), and feedback satisfaction ($t = 1.72, p = .090$), compared with the control group; however, its participants' interest in education ($t = 2.38, p = .020$) and self-directed learning ($t = 2.72, p = .006$) were significantly higher than those in the control group. CONCLUSION: The findings of our study highlighted the potential of artificial intelligence chatbot programs as an educational assistance tool to promote nursing college students' interest in education and self-directed learning. Moreover, such programs can be effective in enhancing nursing students' skills in non-face-to-face-situations caused by the ongoing COVID-19 pandemic.	10.1186/s12909-022-03898-3	
J. W. Han, Park, J., Lee, H. N.	Analysis of the effect of an artificial intelligence chatbot educational program on non-face-to-face classes: a quasi-experimental study	BMC MEDICAL EDUCATION	2022	22	1	Artificial intelligence, Nursing Education, Clinical reasoning, Chatbot program, Data processing	BackgroundEducation and training are needed for nursing students using artificial intelligence-based educational programs. However, few studies have assessed the effect of using chatbots in nursing education. ObjectivesThis study aimed to develop and examine the effect of an artificial intelligence chatbot educational program for promoting nursing skills related to electronic fetal monitoring in nursing college students during non-face-to-face classes during the COVID-19 pandemic. DesignThis quasi-experimental study used a nonequivalent control group non-synchronized pretest-posttest design. MethodsThe participants were 61 junior students from a nursing college located in G province of South Korea. Data were collected between November 3 and 16, 2021, and analyzed using independent t-tests. ResultsThe experimental group in which the artificial intelligence chatbot program was applied did not show statistically significant differences in knowledge ($t = -0.58, p = .567$), clinical reasoning competency ($t = 0.75, p = .455$), confidence ($t = 1.13, p = .264$), and feedback satisfaction ($t = 1.72, p = .090$), compared with the control group; however, its participants' interest in education ($t = 2.38, p = .020$) and self-directed learning ($t = 2.72, p = .006$) were significantly higher than those in the control group. ConclusionThe findings of our study highlighted the potential of artificial intelligence chatbot programs as an educational assistance tool to promote nursing college students' interest in education and self-directed learning. Moreover, such programs can be effective in enhancing nursing students' skills in non-face-to-face-situations caused by the ongoing COVID-19 pandemic.	10.1186/s12909-022-03898-3	
R. Hardt, Ami, M. S., Academic, R., Rudi, M., Bin, M. H. L., Herman, N. S.	An Enhanced Framework for Academic Information Service Using AI Chatbots	NeuroQuantology	2022	20	19 2263-2277	chatbot, article, artificial intelligence, Cronbach alpha coefficient, data consistency, data validity, human, information service, knowledge, linguistics, machine learning, medical research, natural language processing, scientific literature, system analysis, test retest reliability	Students often overlook academic administration data services disseminated through different internet platforms. Using chat tools, students are often more dominant in directly addressing research program supervisors' queries. However, due to a staff shortage on the data provider side, data services through chat apps cannot be delivered adequately. Furthermore, academic staff output started to decline, although chatbot accuracy stayed at 100 percent in studies comparing chatbots to academic staff. Due to the assessment findings, chatbots successfully boost efficiency in dealing with client inquiries. Sixty-two respondents used chatbots, including 13.8 percent of lectures, 9.2 percent of staff, and 76.9 percent of students. Capability, consistency, accountability, and performance are all aspects of chatbot technology testing. The significance threshold for the validity test is 5%. The test findings reveal that consumers' usage of chatbot technology to receive academic information is more trustworthy, with a Cronbach Alpha score of 0.82. Chatbots are being used to provide a solution for the academic community and the academic community to access services more swiftly and efficiently. Chatbots may lower academic personnel's burden and improve service quality at tertiary institutions. In this study, a chatbot was created to deliver data requests from consumers on its own.	10.4804/rq.2022.20.19.N099191	https://www.embase.com/search/results?subaction=viewrecord&id=L20188630148&from=export,http://dx.doi.org/10.4804/rq.2022.20.19.N099191

L. He, Balaji, D., Wiers, R. W., Anthunis, M. L., Krahmer, E.	Effectiveness and acceptability of conversational agents for smoking cessation: A systematic review and meta-analysis	Nicotine Tob Res	2022			chatbot, conversational agent, mHealth, meta-analysis, review, smoking cessation	INTRODUCTION: Conversational agents (computer programs that use artificial intelligence to simulate a conversation with users through natural language) have evolved considerably in recent years to support healthcare by providing autonomous, interactive, and accessible services, making them potentially useful for supporting smoking cessation. We performed a systematic review and meta-analysis to provide an overarching evaluation of their effectiveness and acceptability to inform future development and adoption. METHODS: Psycinfo, Web of Science, ACM Digital Library, IEEE Xplore, Medline, EMBASE, Communication and Mass Media Complete, and CINAHL Complete were searched for studies examining the use of conversational agents for smoking cessation. Data from eligible studies were extracted and used for random-effects meta-analyses. RESULTS: The search yielded 1,245 publications with 13 studies eligible for systematic review (total N = 8,236) and 6 studies for random-effects meta-analysis. All studies reported positive effects on cessation related outcomes. A meta-analysis with RCTs reporting on abstinence yielded a sample-weighted odds ratio (OR) of 1.66 (95% CI 1.33-2.07, p<0.01), favoring conversational agents over comparison groups. A narrative synthesis of all included studies showed overall high acceptability, while some barriers were identified from user-feedback. Overall, included studies were diverse in design with mixed quality, and evidence of publication bias was identified. A lack of theoretical foundations was noted, as well as a clear need for relational communication in future designs. CONCLUSION: The effectiveness and acceptability of conversational agents for smoking cessation are promising. However, standardization of reporting and designing of the agents is warranted for a more comprehensive evaluation. IMPLICATION: This is the first systematic review to provide insight into the use of conversational agents to support smoking cessation. Our findings demonstrated initial promise in the effectiveness and user acceptability of these agents. We also identified a lack of theoretical and methodological limitations to improve future study design and intervention delivery.	10.1093/ntr/rtac281		
L. He, Basar, E., Wiers, R. W., Anthunis, M. L., Krahmer, E.	Can chatbots help to motivate smoking cessation? A study on the effectiveness of motivational interviewing on engagement and therapeutic alliance	BMC Public Health	2022	22	1	Chatbot, Empathy, Engagement, Motivation to Quit, Motivational Interviewing, Smoking Cessation, Therapeutic Alliance, health care delivery, human, motivation, procedures, smoking, Delivery of Health Care, Humans, Smokers	Background: Cigarette smoking poses a major threat to public health. While cessation support provided by healthcare professionals is effective, its use remains low. Chatbots have the potential to serve as a useful addition. The objective of this study is to explore the possibility of using a motivational interviewing style chatbot to enhance engagement, therapeutic alliance, and perceived empathy in the context of smoking cessation. Methods: A preregistered web-based experiment was conducted in which smokers (n = 153) were randomly assigned to either the motivational interviewing (MI)-style chatbot condition (n = 78) or the textual chatbot control condition (n = 75) and interacted with the chatbot in two sessions. In the assessment session, typical intake questions in smoking cessation interventions were administered by the chatbot, such as smoking history, nicotine dependence level, and intention to quit. In the feedback session, the chatbot provided personalized normative feedback and discussed with participants potential reasons to quit. Engagement with the chatbot, therapeutic alliance, and perceived empathy were the primary outcomes and were assessed after both sessions. Secondary outcomes were motivation to quit and perceived communication competence and were assessed after the two sessions. Results: No significant effects of the experimental manipulation (MI-style or neutral chatbot) were found on engagement, therapeutic alliance, or perceived empathy. A significant increase in therapeutic alliance over two sessions emerged in both conditions, with participants reporting significantly increased motivation to quit. The chatbot was perceived as highly competent, and communication competence was positively associated with engagement, therapeutic alliance, and perceived empathy. Conclusion: The results of this preregistered study suggest that talking with a chatbot about smoking cessation can help to motivate smokers to quit and that the effect of conversation has the potential to build up over time. We did not find support for an extra motivating effect of the MI-style chatbot, for which we discuss possible reasons. These findings highlight the promise of using chatbots to motivate smoking cessation. Implications for future research are discussed. © 2022, The Author(s).	10.1186/s12889-022-13115-x	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8512813868&doi=10.1186%2F12889-022-13115-x&partnerID=40&md5=2ac727be74132ebcaa0531b6d329a4c	
Y. He, Yang, L., Zhu, X., Wu, B., Zhang, S., Qian, C., Tian, T.	Mental Health Chatbot for Young Adults With Depressive Symptoms During the COVID-19 Pandemic: Single-Blind, Three-Arm Randomized Controlled Trial	Journal of Medical Internet Research	2022	24	11	CHCTR100052532, chatbot, adolescent, adult, article, Chinese, clinical article, clinical effectiveness, cognitive behavioral therapy, controlled study, coronavirus disease 2019, depression, emotion, female, follow up, human, loneliness, male, mental health, mental health service, mindfulness meditation, natural language processing, outcome assessment, pandemic, Patient Health Questionnaire 9, psychological counseling, randomized controlled trial, religion, satisfaction, self esteem, single blind procedure, thematic analysis, working alliance questionnaire, young adult	Background: Depression has a high prevalence among young adults, especially during the COVID-19 pandemic. However, mental health services remain scarce and underutilized worldwide. Mental health chatbots are a novel digital technology to provide fully automated interventions for depressive symptoms. Objective: The purpose of this study was to test the clinical effectiveness and nonclinical performance of a cognitive behavioral therapy (CBT)-based mental health chatbot (XiaoE) for young adults with depressive symptoms during the COVID-19 pandemic. Methods: In a single-blind, 3-arm randomized controlled trial, participants manifesting depressive symptoms recruited from a Chinese university were randomly assigned to a mental health chatbot (XiaoE; n=40), an e-book (n=40), or a general chatbot (XiaoG; n=50) group in a ratio of 1:1:1. Participants received a 1-week intervention. The primary outcome was the reduction of depressive symptoms according to the 9-item Patient Health Questionnaire (PHQ-9) at 1 week later (T1) and 1 month later (T2). Both intention-to-treat and per-protocol analyses were conducted under analysis of covariance models adjusting for baseline data. Controlled multiple imputation and 6-based sensitivity analysis were performed for missing data. The secondary outcomes were the level of working alliance measured using the Working Alliance Questionnaire (WAQ), usability measured using the Usability Metric for User Experience-LITE (UMUX-LITE), and acceptability measured using the Acceptability Scale (AS). Results: Participants were on average 18.78 years old, and 37.2% (55/148) were female. The mean baseline PHQ-9 score was 10.02 (SD 3.18; range 2-19). Intention-to-treat analysis revealed lower PHQ-9 scores among participants in the XiaoE group compared with participants in the e-book group and XiaoG group at both T1 (F2,136=17.01; P = .001; d=0.51) and T2 (F2,136=5.477; P=.005; d=0.31). Better working alliance (WAQ; F2,145=3.407; P=.04) and acceptability (AS; F2,145=0.322; P=.02) were discovered with XiaoE, while no significant difference among arms was found for usability (UMUX-LITE; F2,145=0.968; P=.38). Conclusions: A CBT-based chatbot is a feasible and engaging digital therapeutic approach that allows easy accessibility and self-guided mental health assistance for young adults with depressive symptoms. A systematic evaluation of nonclinical metrics for a mental health chatbot has been established in this study. In the future, focus on both clinical outcomes and nonclinical metrics is necessary to explore the mechanism by which mental health chatbots work on patients. Further evidence is required to confirm the long-term effectiveness of the mental health chatbot via trials replicated with a longer dose, as well as exploration of its stronger efficacy in comparison with other active controls.	10.2196/40719	https://www.embase.com/search/results?subaction=viewrecord&id=120219548708from=export,http://dx.doi.org/10.2196/40719	
A. Huang, Chao, Y., de la Mora Velasco, E., Bilgihan, A., Wei, W.	When artificial intelligence meets the hospitality and tourism industry: an assessment framework to inform theory and management	Journal of Hospitality and Tourism Insights	2022	5	5	1080-1100	Artificial intelligence, Augmented reality, Deep learning, Innovations diffusion, Machine learning, Technology adoption, Virtual reality	Purpose: This study reviews existing research and current applications of artificial intelligence (AI) in the hospitality and tourism industry. It further proposes a new evaluation framework to inform the susceptibility of AI adoptions. Design/methodology/approach: This is a synthesis and evaluation study that qualitatively summarizes and presents findings on AI applications in the hospitality and tourism industry. Current AI applications are rated using a seven-dimensional framework based on Rogers' (2003) diffusion theory. Findings: AI adoption susceptibility in the hospitality and tourism industry varies based on the type of AI. Search/booking engines, virtual agents and chatbots rank high in the adoption susceptibility. Research limitations/implications: This study bridges innovation diffusion theoretical underpinnings and AI applications. The findings support researchers, developers and managers in evaluating the adoption susceptibility of AI technologies in the hospitality and tourism industry. Originality/value: This paper is among the few that focus on assessing AI adoption susceptibility in the hospitality and tourism industry. This paper develops a theory-based framework for systematically evaluating AI innovations in hospitality and tourism. © 2021, Emerald Publishing Limited.	10.1108/JHTI-01-2021-0021	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85111042456&doi=10.1108%2FJHTI-01-2021-0021&partnerID=40&md5=e5781bc542cf135eb5df98e154f5837
H. Y. Huang, Fanjiang, Y., Y., Hung, C. H., Lee, C. A.	Design and Implementation of a Smart Intercom System through Web Services on Web of Things	Telecom	2022	3	4	675-691	embedded system, instant messaging software, web of things, web service	In this paper, an embedded system is used as a host for the intercom and as a chatbot server for this system. The chatbot server controls door locks, cameras, buzzers, and related devices through web services on the WoT (Web of Things) to provide residents and visitors with better functionality and integrational services. This system can greatly improve the security and convenience of the system compared with the traditional intercom system. The resident uses the instant messaging software of the smartphone to replace the handset function, and there is no need to install and learn new apps, reducing the cost of the handset and the wiring indoors and outdoors. Whether or not the residents are at home, they can check whether there are visitors and check the status of their doors through their smartphones. Conversely, any visitor can also contact the resident through this intercom, while there is no way to confirm whether the resident is at home or not, which enhances the security of the house. This system provides flexibility in wireless installation and use and sufficient mobility for residents. The system architecture strikes a good balance between user convenience and home security and between performance and cost, effectively improving home security and reducing costs. © 2022 by the authors.	10.3390/telecom3040036	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144736079&doi=10.3390%2Ftelecom3040036&partnerID=40&md5=230dcfe589d61025e564275ab8171541
I. Iancu, Iancu, B.	Interacting with chatbots later in life: A technology acceptance perspective in COVID-19 pandemic situation	Front Psychol	2022	13		1111003	behavioral intention, chatbots, middle-aged and aging adults, perceived ease of use, perceived usefulness, technology acceptance model, commercial or financial relationships that could be construed as a potential, conflict of interest.	INTRODUCTION: Within the technological development path, chatbots are considered an important tool for economic and social entities to become more efficient and to develop customer-centric experiences that mimic human behavior. Although artificial intelligence is increasingly used, there is a lack of empirical studies that aim to understand consumers' experience with chatbots. Moreover, in a context characterized by constant population aging and an increased life-expectancy, the way aging adults perceive technology becomes of great interest. However, based on the digital divide (unequal access to technology, knowledge, and resources), and since young adults (aged between 18 and 34 years old) are considered to have greater affinity for technology, most of the research is dedicated to their perception. The present paper investigates the way chatbots are perceived by middle-aged and aging adults in Romania. METHODS: An online opinion survey has been conducted. The age-range of the subjects is 40-78 years old, a convenience sampling technique being used (N = 235). The timeframe of the study is May-June 2021. Thus, the COVID-19 pandemic is the core context of the research. A covariance-based structural equation modelling (CB-SEM) has been used to test the theoretical assumptions as it is a procedure used for complex conceptual models and theory testing. RESULTS: The results show that while perceived ease of use is explained by the effort, the competence, and the perceive external control in interacting with chatbots, perceived usefulness is supported by the perceived ease of use and subjective norms. Furthermore, individuals are likely to further use chatbots (behavioral intention) if they consider this interaction useful and if the others' opinion is in favor of using it. Gender and age seem to have no effect on behavioral intention. As studies on chatbots and aging adults are few and are mainly investigating reactions in the healthcare domain, this research is one of the first attempts to better understand the way chatbots in a not domain-specific context are perceived later in life. Likewise, judging from a business perspective, the results can help economic and social organizations to improve and adapt AI-based interaction for the aging customers.	10.3389/fpsyg.2022.1111003	
A. Janssen, Rodrigues Cardona, D., Passlick, J., Bretnier, M. H.	How to Make Chatbots Productive - A user-oriented implementation framework	International Journal of Human Computer Studies	2022	168			Chatbot implementation framework, Human computer interaction, Human-centered design, PACT framework, Activity contexts, Chatbots, Corporate environment, Human-centered designs, Implementation process, People, activity, context, and technology framework, Semi structured interviews, Service process, User oriented	Many organizations are pursuing the implementation of chatbots to enable automation of service processes. However, previous research has highlighted the existence of practical setbacks in the implementation of chatbots in corporate environments. To gain practical insights on the issues related to the implementation processes from several perspectives and stages of deployment, we conducted semi-structured interviews with developers and experts of chatbot development. Using qualitative content analysis and based on a review of literature on human computer interaction (HCI), information systems (IS), and chatbots, we present an implementation framework that supports the successful deployment of chatbots and discuss the implementation of chatbots through a user-oriented lens. The proposed framework contains 101 guiding questions to support chatbot implementation in an eight-step process. The questions are structured according to the people, activity, context, and technology (PACT) framework. The adapted PACT framework is evaluated through expert interviews and a focus group discussion (FGD) and is further applied in a case study. The framework can be seen as a bridge between science and practice that serves as a notional structure for practitioners to introduce a chatbot in a structured and user-oriented manner. © 2022	10.1016/j.ijhcs.2022.102921	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139205060&doi=10.1016%2Fijhcs.2022.102921&partnerID=40&md5=66c6f28028c573393ca878d3c3203aac
A. Janssen, Cardona, D. R., Passlick, J., Bretnier, M. H.	How to Make Chatbots Productive - A user-oriented implementation framework	INTERNATIONAL JOURNAL OF HUMAN-COMPUTER STUDIES	2022	168			PACT framework, Chatbot implementation framework, Human computer interaction, Human-centered design, PUBLIC-SECTOR, DESIGN, TECHNOLOGY, AI	Many organizations are pursuing the implementation of chatbots to enable automation of service processes. However, previous research has highlighted the existence of practical setbacks in the implementation of chatbots in corporate environments. To gain practical insights on the issues related to the implementation processes from several perspectives and stages of deployment, we conducted semi-structured interviews with developers and experts of chatbot development. Using qualitative content analysis and based on a review of literature on human computer interaction (HCI), information systems (IS), and chatbots, we present an implementation framework that supports the successful deployment of chatbots and discuss the implementation of chatbots through a user-oriented lens. The proposed framework contains 101 guiding questions to support chatbot implementation in an eight-step process. The questions are structured according to the people, activity, context, and technology (PACT) framework. The adapted PACT framework is evaluated through expert interviews and a focus group discussion (FGD) and is further applied in a case study. The framework can be seen as a bridge between science and practice that serves as a notional structure for practitioners to introduce a chatbot in a structured and user-oriented manner.	10.1016/j.ijhcs.2022.102921	

J. Jeindl, Goetz, G.	Chatbot-Based Symptom-Checkers: A Systematic Review	International Journal of Technology Assessment in Health Care	2022	38	532	adult, chatbot, conference abstract, diagnosis, diagnostic accuracy, diagnostic test accuracy study, drug safety, emergency care, female, health care personnel, human male, medical research, observational study, overdiagnosis, patient triage, Quality Assessment of Diagnostic Accuracy Studies, randomized controlled trial (topic), risk assessment, self care, synthesis, systematic review, usability, validity, verbal behavior	Introduction. Symptom-checkers are digital health applications (DHA) with diagnostic algorithms. These symptom-checkers claim to improve the diagnostic process and patient guidance. After asking the user to describe the symptoms using a chatbot interface, the symptom-checkers offer a list of potential diagnoses, and/or give recommendations for appropriate action (self-care, doctor's visit, or emergency care). Because of the growing number and increasing use of these diagnostic DHA, there is a need to evaluate the evidence. Method. We updated a British evidence synthesis on symptomcheckers from the National Institute for Health Research (NIHR, 2019). For the systematic update search, we selected four databases. The following endpoints were selected: effectiveness, safety, diagnostic accuracy, triage accuracy, organizational and patient-relevant endpoints. For accuracy studies included from the update search, we assessed the risk of bias (RoB) using the quality assessment tool of diagnostic accuracy studies (QUADAS-2). Results. The NIHR-report included 27 studies. We added 14 additional studies via update search. One randomized-controlled-trial (RCT) reported a prolonged illness duration when using symptomcheckers (statistically non-significant). No harms when using symptom-checkers were identified (six observational studies). The diagnostic accuracy ranged from 14-84.3 percent (ten observational studies), the triage accuracy ranged from 33-100 percent (eleven observational studies). For organizational endpoints, the results were inconsistent (one RCT, six observational studies). The patient perspective indicates a high usability for symptom-checkers, but the limited description of symptoms and the missing verbal interaction with health personnel were mentioned as hindering factors (nine survey-studies). The QUADAS-2 assessment for RoB was low in one, and high in seven studies. Conclusions. The studies were often conducted using fictitious casevignettes, limiting the validity of the evidence. Therefore, the results for the diagnostic and triage accuracy are insufficient to demonstrate a benefit in real-world settings. Additionally, there is a concern for misdiagnosis and overdiagnosis. We recommend a continuous monitoring of these diagnostic DHA, using high-quality studies.	10.1017/S0266646232001313	https://www.embase.com/search/results?subaction=viewrecord&id=L640045336&from=export , http://dx.doi.org/10.1017/S0266646232001313	
W. Kansteiner	DIGITAL DOPING FOR HISTORIANS: CAN HISTORY, MEMORY, AND HISTORICAL THEORY BE RENDERED ARTIFICIALLY INTELLIGENT?	History and Theory	2022	61	4	119-133	argumentation, artificial intelligence (AI), collective memory, description, GPT-3, historical theory, historical writing, large language models, machine learning, narration, OpenAI	Artificial intelligence is making history, literally. Machine learning tools are playing a key role in crafting images and stories about the past in popular culture. AI has probably also already invaded the history classroom. Large language models such as GPT-3 are able to generate compelling, non-plagiarized texts in response to simple natural language inputs, thus providing students with an opportunity to produce high-quality written assignments with minimum effort. In a similar vein, tools like GPT-3 are likely to revolutionize historical studies, enabling historians and other professionals who deal in texts to rely on AI-generated intermediate work products, such as accurate translations, summaries, and chronologies. But present-day large language models fail at key tasks that historians hold in high regard. They are structurally incapable of telling the truth and tracking pieces of information through layers of texts. What's more, they lack ethical self-reflexivity. Therefore, for the time being, the writing of academic history will require human agency. But for historical theorists, large language models might offer an opportunity to test basic hypotheses about the nature of historical writing. Historical theorists can, for instance, have customized large language models write a series of descriptive, narrative, and assertive histories about the same events, thereby enabling them to explore the precise relation between description, narration, and argumentation in historical writing. In short, with specifically designed large language models, historical theorists can run the kinds of large-scale writing experiments that they could never put into practice with real historians. © 2022 The Authors. History and Theory published by Wiley Periodicals LLC on behalf of Wesleyan University.	10.1111/hith.12282	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143989724&doi=10.1111%2Fhith.12282&partnerID=40&md5=6a05c57780c13c065e9754e307a7192
K. Kevyan, Huang, J. X.	How to Approach Ambiguous Queries in Conversational Search: A Survey of Techniques, Approaches, Tools, and Challenges	ACM Computing Surveys	2022	55	6		Ambiguous query, conversational agents, conversational question answering, Conversational Search System, dialogue system, query understanding, Natural language processing systems, Search engines, Speech processing, Technology transfer, User interface, Dialogue systems, Language processing, Natural languages, Question Answering, Search system, Safety devices	The advent of recent Natural Language Processing technology has led human and machine interactions more toward conversation. In Conversational Search Systems (CSS) like chatbots and Virtual Personal Assistants such as Apple's Siri, Amazon Alexa, Microsoft's Cortana, and Google Assistant, both user and device have a limited platform to communicate through chatting or voice. In the information-seeking process, often users do not know how to properly describe their information need in a machine understandable language. Consequently, it is hard for the assistant agent to predict the user's intent and yield relevant results by only relying on the original query. Studies have shown many unsatisfactory results can be enhanced with the benefit of CSS, which can dig deeper into the user's query to reveal the real need. This survey intends to provide a comprehensive and comparative overview of ambiguous query clarification task in the context of conversational search technology. We investigate different approaches, their evaluation methods, and future work. We also address the importance of understanding a query for retrieving the most relevant document(s) and satisfying user's need by predicting their potential request. This work provides an overview of characteristics of ambiguous queries and contributes to better understanding of the existing technologies and challenges in CSS focus on disambiguation of unclear queries from various dimensions. © 2022 Association for Computing Machinery.	10.1145/3534965	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146490165&doi=10.1145%2F3534965&partnerID=40&md5=ea09f0a2c2df6b44c324ba659de23a
F. Khalil, Pipa, G.	Transforming the general pre-trained transformer into augmented business text writer	Journal of Big Data	2022	9	1		Business text generator, Natural language generation, Transformers	This study uses transformers architecture of Artificial neural networks to generate artificial business text for a given topic or theme. The implication of the study is to augment the business report writing, and general business writings process with help of generative pretrained transformers (generative pretrained transformer (GPT)) networks. Main focus of study is to provide practical use case for GPTs models with help of big data. Our study model has 355 million model parameters and trained for three months on GPU enable devices using 2.3 billion text tokens(is available as open-source data now). Text tokens are collected with help of rigorous preprocessing, which includes; shortlisting of Subreddits of Fortune 500 companies and industries, listed on US-based social news aggregation online portal called "Reddit". After shortlisting, millions of submission of users during the five years, are parsed to collect the URLs out of it. 1.8 million working URLs are scrutinized. Business text is parsed, cleaned, and converted into word embeddings out of uniform resource locator (URLs). The result shows that both models; conditional interactive and random sampling, generate text paragraphs that are grammatically accurate and stick to the given topic. © 2022, The Author(s).	10.1186/s40537-022-00663-7	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142536888&doi=10.1186%2F40537-022-00663-7&partnerID=40&md5=a77a7919d84c9ee722a842e1cb5acbb2
G. H. Kim, Kim, B., Jeong, J. H.	THE EFFECTS OF HOME-BASED COGNITIVE INTERVENTION WITH CHAT-BOT ON BRAIN FUNCTION IN PATIENTS WITH AMNESTIC MILD COGNITIVE IMPAIRMENT	Journal of Prevention of Alzheimer's Disease	2022	9		5240	adult, attention, beta rhythm, brain function, calculation, cognition, conference abstract, controlled study, demography, electroencephalogram, executive function, female, human, language, major clinical study, male, memory, mental performance, mild cognitive impairment, neuropsychological assessment, outcome assessment, randomized controlled trial, single blind procedure	Background and Purpose: Cognitive intervention (CI) has been known to improve cognition and to delay cognitive decline in patients with mild cognitive impairment. The purpose of this study was whether our newly developed, home-based CI with a chat bot for 12 weeks changed brain function and cognitive performance in patients with amnesic mild cognitive impairment(MCI). Methods: A single-blind randomized controlled trial was conducted in 72 patients with amnesic MCI. Participants were randomized into the two groups: the CI with chat bot (CI) (n=36) group and waitlist control group without CI (Control) (n=36) groups. A total of 13 chat-bot-based CI programs were developed targeting for attention, memory, visuospatial, calculation, language and frontal executive functions. The CI comprised 30-min-session per day for 12 weeks. The primary outcome was the changes in brain function measured by resting state electroencephalogram (EEG), which was measured in eyes open and eyes closed conditions for 3 minutes each, with a 19-channel wireless EEG device. The secondary outcome was the changes of cognitive function measured using the Cambridge Neuropsychological Test Automated Battery. Results: There were no baseline demographic and clinical differences between the CI and the control groups. EEG analysis after 12-week showed increased beta wave on the frontal areas in the CI group, while decreased beta wave on the frontal areas in the control group. In addition, CI group also demonstrated improvement in attention domain compared to the control group. Conclusions: Considering that increased beta wave is associated with attention performance, our results suggest that the 12 week home-based CI with chat bot could help improve brain function in patient with MCI.	10.14283/jpad.2022.97	https://www.embase.com/search/results?subaction=viewrecord&id=L63987331&from=export , http://dx.doi.org/10.14283/jpad.2022.97
J. H. Kim	Search for Medical Information and Treatment Options for Musculoskeletal Disorders Through an Artificial Intelligence Chatbot: Focusing on Shoulder Impingement Syndrome		2022		(Kim J.-H., kemalgh@naver.com) Spine&Skele, Resear h & Development, KOREAT ECH Corporation, South Korea		adult, artificial intelligence, chatbot, exercise, human, medical information, musculoskeletal disease, natural language processing, prevalence, risk factor, shoulder impingement syndrome	Background: The ChatGPT is an artificial intelligence chatbot that processes natural language text learned through reinforcement learning based on the GPT-3.5 architecture, a large-scale language model. Natural language processing models are being used in various fields and are gradually expanding their use in the medical field. Purpose: This study aimed to investigate the medical information or treatment options that ChatGPT can provide for SIS. Method: Using ChatGPT, which is provided as a free beta test, messages related to SIS were entered, and responses to medical information and treatment options were received and analyzed. Result: ChatGPT not only provided answers to the definition, prevalence, and risk factors of SIS, but also symptoms, diseases with similar symptoms, and orthopedic tests according to the messages input. Additionally, a list of treatment options and exercises were provided. Conclusion: ChatGPT will be able to provide overall useful medical information and treatment options to patients unfamiliar with SIS. However, caution is required as it contains content that may be biased or inappropriate information for patients with SIS. Nevertheless, if natural language processing technology develops further, it is expected to be able to express more detailed medical information and treatment options.	10.1101/2022.12.16.22283512	https://www.embase.com/search/results?subaction=viewrecord&id=L63987331&from=export , http://dx.doi.org/10.1101/2022.12.16.22283512
Y. J. Kim, Delisa, J. A., Chung, Y. C., Shapiro, N. L., Kolar Rajanna, S. K., Barbour, E., Loeb, J. A., Turner, J. A., Daley, S., Skowlund, J., Krishnan, J. A.	Recruitment in a research study via chatbot versus telephone outreach: a randomized trial at a minority-serving institution	Journal of the American Medical Informatics Association	2022	29	1	149-154	chatbot, telephone, adult, article, comparative study, female, human, male, outcome assessment, questionnaire, vaccination, vaccine hesitancy	Chatbots are software applications to simulate a conversation with a person. The effectiveness of chatbots in facilitating the recruitment of study participants in research, specifically among racial and ethnic minorities, is unknown. The objective of this study is to compare a chatbot versus telephone-based recruitment in enrolling research participants from a predominantly minority patient population at an urban institution. We randomly allocated adults to receive either chatbot or telephone-based outreach regarding a study about vaccine hesitancy. The primary outcome was the proportion of participants who provided consent to participate in the study. In 935 participants, the proportion who answered contact attempts was significantly lower in the chatbot versus telephone group (absolute difference: -21.8%; 95% confidence interval [CI]: -27.0%, -16.5%; P = 0.001). The consent rate was also significantly lower in the chatbot group (absolute difference: -3.4%; 95% CI: -5.7%, -1.1%; P = 0.004). However, among participants who answered a contact attempt, the difference in consent rates was not significant. In conclusion, the consent rate was lower with chatbot compared to telephone-based outreach. The difference in consent rates was due to a lower proportion of participants in the chatbot group who answered a contact attempt.	10.1093/jamia/ocab240	https://www.embase.com/search/results?subaction=viewrecord&id=L63987331&from=export , http://dx.doi.org/10.1093/jamia/ocab240
J. Z. Kolter	AlphaCode and "data-driven" programming	Science	2022	378	6624	1056	applied science, data set, Article, data driven programming, data processing, data science, language, large language model, model, prediction, software		10.1126/science.ad8258	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143571175&doi=10.1126%2Fscience.ad8258&partnerID=40&md5=f023a074ad2f14fd508cf1b59707
A. Krithara, Nentidis, A., Bougiatiotis, K., Palouras, G.	BioASQ-QA: A manually curated corpus for Biomedical Question Answering		2022		(Krithara A., a.krithara@titl.de) mokrito s.g.; Nentidis A.; Bougiatiotis K.; Palouras s.g.; Institute of Informatics and Telecommunications, National Center for Scientific Research "Demok		answering service, gold standard, human, human experiment, information retrieval, language, running	The BioASQ question answering (QA) benchmark dataset contains questions in English, along with golden standard (reference) answers and related material. The dataset has been designed to reflect real information needs of biomedical experts and is therefore more realistic and challenging than most existing datasets. Furthermore, unlike most previous QA benchmarks that contain only exact answers, the BioASQ-QA dataset also includes ideal answers (in effect summaries), which are particularly useful for research on multi-document summarization. The dataset combines structured and unstructured data. The material linked with each question comprise documents and snippets, which are useful for Information Retrieval and Passage Retrieval experiments, as well as concepts that are useful in concept-to-text Natural Language Generation. Researchers working on paraphrasing and textual entailment can also measure the degree to which their methods improve the performance of biomedical QA systems. Last but not least, the dataset is continuously extended, as the BioASQ challenge is running and new data are generated.	10.1101/2022.12.14.520213	https://www.embase.com/search/results?subaction=viewrecord&id=L63987331&from=export , http://dx.doi.org/10.1101/2022.12.14.520213

M. A. Kuhlai, Thomas, J., Alramlawi, S., Shah, S. J., H., Thormquist, E.	Interacting with a Chatbot-Based Understanding System: the Effect of Chatbot Personality and User Gender on Behavior	Informatics	2022	9	4	authenticity, chatbot behavior, chatbot personality, engagement, human-computer interaction, trust, usage intention	Chatbots with personality have been shown to affect engagement and user subjective satisfaction. Yet, the design of most chatbots focuses on functionality and accuracy rather than an interpersonal communication style. Existing studies on personality-inbued chatbots have mostly assessed the effect of chatbot personality on user preference and satisfaction. However, the influence of chatbot personality on behavioral qualities, such as users' trust, engagement, and perceived authenticity of the chatbots, is largely unexplored. To bridge this gap, this study contributes: (1) A detailed design of a personality-inbued chatbot used in academic advising. (2) Empirical findings of an experiment with students who interacted with three different versions of the chatbot. Each version, vetted by psychology experts, represents one of the three dominant traits, agreeableness, conscientiousness, and extraversion. The experiment focused on the effect of chatbot personality on trust, authenticity, engagement, and intention to use the chatbot. Furthermore, we assessed whether gender plays a role in students' perception of the personality-inbued chatbots. Our findings show a positive impact of chatbot personality on perceived chatbot authenticity and intended engagement, while student gender does not play a significant role in the students' perception of chatbots. © 2022 by the authors.	10.3390/informatics9040081	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144714496&doi=10.3390/informatics9040081&partnerID=40&md5=20c0b4f8ddc8d23ae14c5145bcb008
S. Kumar, Sumers, T. R., Yamakoshi, T., Goldstein, A., Hasson, U., Norman, K. A., Griffiths, T. L., Hawkins, R. D., Nastase, S. A.	Reconstructing the cascade of language processing in the brain using the internal computations of a transformer-based language model		2022		(Kumar S., Sreejank @prince ton.edu; Goldstei n A.; Hasson U.; Norman K.A.; Hawkins R.D.; Nastase S.A.; snastase @prince ton.edu) Princeto n Neurosc ience Institute Princeto n Universi	adult, attention, brain cortex, brain function, comprehension, decomposition, embedding, female, functional magnetic resonance imaging, human, human experiment, language processing, male, prediction	Piecing together the meaning of a narrative requires understanding not only the individual words but also the intricate relationships between them. How does the brain construct this kind of rich, contextual meaning from natural language? Recently, a new class of artificial neural networks-based on the Transformer architecture-has revolutionized the field of language modeling. Transformers integrate information across words via multiple layers of structured circuit computations, forming increasingly contextualized representations of linguistic content. In this paper, we deconstruct these circuit computations and analyze the associated "transformations" (alongside the more commonly studied "embeddings") at each layer to provide a fine-grained window onto linguistic computations in the human brain. Using functional MRI data acquired while participants listened to naturalistic spoken stories, we find that these transformations capture a hierarchy of linguistic computations across cortex, with transformations at later layers in the model mapping onto higher-level language areas in the brain. We then decompose these transformations into individual, functionally-specialized "attention heads" and demonstrate that the emergent syntactic computations performed by individual heads correlate with predictions of brain activity in specific cortical regions. These heads fall along gradients corresponding to different layers, contextual distances, and syntactic dependencies in a low-dimensional cortical space. Our findings provide a new basis for using the internal structure of large language models to better capture the cascade of cortical computations that support natural language comprehension.	10.1101/2022.06.08.495348	https://www.ebmsc.com/search/results?subaction=viewrecord&id=10191454857&from=export,http://dx.doi.org/10.1101/2022.06.08.495348
T. H. Kung, Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., Madriaga, M., Aggabao, R., Diaz-Candido, G., Maningo, J., Tseng, V.	Performance of ChatGPT on USMLE: Potential for AI-Assisted Medical Education Using Large Language Models		2022		(Kung T.H.; Medenilla A.; Sillos C.; De Leon L.; Elepaño C.; Madriaga M.; Aggabao R.; Diaz-Candido G.; Maningo J.; Tseng V.; victor@ansiblehealth.com) Ansible Health, Inc.	clinical decision making, human, human experiment, language, licensing, medical education, reinforcement (psychology), United States	We evaluated the performance of a large language model called ChatGPT on the United States Medical Licensing Exam (USMLE), which consists of three exams: Step 1, Step 2CK, and Step 3. ChatGPT performed at or near the passing threshold for all three exams without any specialized training or reinforcement. Additionally, ChatGPT demonstrated a high level of concordance and insight in its explanations. These results suggest that large language models may have the potential to assist with medical education, and potentially, clinical decision-making.	10.1101/2022.12.19.22283643	https://www.ebmsc.com/search/results?subaction=viewrecord&id=10220755944&from=export,http://dx.doi.org/10.1101/2022.12.19.22283643
L. Kuosmanen, Vartiainen, A. K., Nieminen, H., Kotiranta, C., Bond, R., Mulvenna, M., Potts, C., Eniri, E., Malcolm, M., Vakaloudis, A., Cahill, B., Dhanapala, I.	Development process of artificial intelligence based chatbot to support and promote mental wellbeing in sparsely populated areas of five European countries	European Psychiatry	2022	65	5168	artificial intelligence, chatbot, conference abstract, controlled study, exercise, human, human experiment, language, major clinical study, mental health, mental health care personnel, mental health service, mood, positive psychology, preliminary data, psychological well-being, self care, university student, wellbeing	Introduction: In many countries, people face problems regarding access to care, 24/7 support and evidence-based support. Digital interventions and services, such as chatbots, can be one option to tackle these challenges. There is a lack of knowledge regarding how mental health chatbots are developed and how to ensure that there is collaboration between mental health and digital technology experts and users. Objectives: This presentation describes the phases of the development for the ChatPal mental health and wellbeing chatbot. Methods: Development process was conducted in five and with four different languages. First, using an electronic survey for mental health professionals (n=190) we screened how familiar they are with chatbots and how they evaluated their potential. Second, university students and staff, mental health professionals and service users (n=78) participated in workshops to design the chatbot content. Finally, the content and scripts of chatbot were written in multi-professional and multi-national collaboration. Results: ChatPal is based on the PERMAH model of positive psychology and on the idea that we all have mental health which needs boosting and support from time to time. ChatPal includes relevant mental health information, exercises, mood diaries and simple monitoring and self-care tools. Based on preliminary evaluations, the ChatPal chatbot offers an option to offer support in areas where other mental health services are lacking or are insufficient. Conclusions: ChatPal is already freely available in application stores and first scientific trials are have started. Preliminary results of 4-week and subsequent 12-week in-the-wild trials will be in place at the time of EPA 2022 conference.	10.1192/j.eurpsy.2022.446	https://www.ebmsc.com/search/results?subaction=viewrecord&id=10220755944&from=export,http://dx.doi.org/10.1192/j.eurpsy.2022.446
K. Kuppusamy, Eswaran, C.	Convolutional and Deep Neural Networks based techniques for extracting the age-relevant features of the speaker	Journal of Ambient Intelligence and Humanized Computing	2022	13	12 5655-5667	ASR, CNN-DNN, Prosodic features, Speaker age, Spectral features, Convolution, Convolutional neural networks, Learning systems, Speech recognition, Google, Natural languages, Network-based, Relevant features, Spectral feature, Voice-recognition systems, Deep neural networks	With the advent of conversational voice recognition systems such as Alexa, Siri, Ok Google, etc., natural language conversational scheme including Chatbot and voice recognition systems are in new high and determining the age of a speaker is critical for setting the pertinent context. Age can be inferred from the speech signal by inferring various factors such as physical attributes of voice, linguistic attributes, frequency, speech rate, etc., This paper discusses on extracting the spectral features of speech such as Cepstral Coefficients, Spectral Decrease, Centroid, Flatness, Spectral Entropy, Jitter and Shimmer as inputs which would also helps in classifying speaker age through deep learning techniques. A novel approach is addressed along with the model for implementation using Deep Neural Network and Convolutional Neural Network for classifying the features using three different classifiers. The results obtained from the proposed system would outline the performance in speaker age recognition. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.	10.1007/s12652-021-03238-1	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85105232645&doi=10.1145%2F3527188.3561929&partnerID=40&md5=3a577cdd8f85ba4b10d72f891f9f4626
G. Laban, Araujo, T.	Don't Take it Personally: Resistance to Individually Targeted Recommendations from Conversational Recommender Agents		2022		57-66	Anthropomorphism, Chatbots, Conversational Agents, E-commerce, Personalization, Privacy, Recommender Systems, Trust, Electronic commerce, Risk perception, Human like, Intelligent recommender system, Personalizations, Recommender agent, User resistances	Conversational recommender agents are artificially intelligent recommender systems that provide users with individually-tailored recommendations by targeting individual needs and communicating in a flowing dialogue. These are widely available online, communicating with users while demonstrating human-like (anthropomorphic) social cues. Nevertheless, little is known about the effect of their anthropomorphic cues on users' resistance to the system and recommendations. Accordingly, this study examined the extent to which conversational recommender agents' anthropomorphic cues and the type of recommendations provided (user-initiated and system-initiated) influenced users' perceptions of control, trustworthiness, and the risk of using the platform. The study assessed how these perceptions, in turn, influence users' adherence to the recommendations. An online experiment was conducted among users with conversational recommender agents and web recommender platforms that provided user-initiated or system-initiated restaurant recommendations. The results entail that user-initiated recommendations, compared to system-initiated, are less likely to affect users' resistance to the system and are more likely to affect their adherence to the recommendations provided. Furthermore, the study's findings suggest that these effects are amplified for conversational recommender agents, demonstrating anthropomorphic cues, in contrast to traditional systems as web recommender platforms. © 2022 ACM.	10.1145/3527188.3561929	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144608660&doi=10.1145%2F3527188.3561929&partnerID=40&md5=72e8427f5a776f3b97c5e351ef72bd7
D. Lee, Yeo, S.	Developing an AI-based chatbot for practicing responsive teaching in mathematics	Computers and Education	2022	191		Elementary education, Improving classroom teaching, Pedagogical issues, Simulations, Teaching/learning strategies, Curricula, Iterative methods, Teaching, Chatbots, Design features, Mathematical reasoning, Preservice teachers, Simulation, Teaching skills, Teaching/learning strategy, Students	Responsive teaching promotes students' mathematical reasoning and positive attitudes toward mathematics. Due to the complexity of the work of teaching, preservice teachers (PSTs) have been provided with approximated opportunities to practice responsive teaching skills in teacher education programs. Although increasing demand for adaptive learning reinforces the need for research on artificial intelligence (AI) in education, there have been few approaches that engaged learners in meaningful interactions. Our goal was to develop an AI-based chatbot that engaged PSTs in an authentic, meaningful, and open-ended teaching situation to enhance PSTs' responsive teaching skills, specifically questioning skills through approximations of practice. The chatbot was designed to act as a virtual student who displayed misconceptions on the topic of fractions. By employing design-based research, we examined 1) design features and structure of the chatbot, 2) coverage of users' input, 3) PSTs' questioning patterns, and 4) users' experiences. Two iterations of design, implementation and evaluation took place in an elementary mathematics education methods course. To build the chatbot we qualitatively analyzed the training data, categorized them into the smallest meaningful intents of users, and prepared corresponding responses to each intent. At the final iteration, the refined chatbot adequately covered PSTs' questions and provided realistic responses. We found a pattern of PSTs asking similar questions repeatedly in the conversation data. Through multiple iterations, certain design features could lead to improved questioning patterns and user perceptions, including sequential responses, informing responses, and personalization. Implications, design features, and limitations are discussed. © 2022 Elsevier Ltd	10.1016/j.compedu.2022.104646	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85138804765&doi=10.1016%2Fj.compedu.2022.104646&partnerID=40&md5=01c7ebc55b3c20591e748b5642a87b4e
D. B. Lee, Yeo, S. H. Y.	Developing an AI-based chatbot for practicing responsive teaching in mathematics	COMPUTERS & EDUCATION	2022	191		Elementary education, Improving classroom teaching, Pedagogical issues, Simulations, Teaching, learning strategies, DESIGN-BASED RESEARCH, PREPARING TEACHERS, EDUCATION, TECHNOLOGY, ERRORS	Responsive teaching promotes students' mathematical reasoning and positive attitudes toward mathematics. Due to the complexity of the work of teaching, preservice teachers (PSTs) have been provided with approximated opportunities to practice responsive teaching skills in teacher education programs. Although increasing demand for adaptive learning reinforces the need for research on artificial intelligence (AI) in education, there have been few approaches that engaged learners in meaningful interactions. Our goal was to develop an AI-based chatbot that engaged PSTs in an authentic, meaningful, and open-ended teaching situation to enhance PSTs' responsive teaching skills, specifically questioning skills through approximations of practice. The chatbot was designed to act as a virtual student who displayed misconceptions on the topic of fractions. By employing design-based research, we examined 1) design features and structure of the chatbot, 2) coverage of users' input, 3) PSTs' questioning patterns, and 4) users' experiences. Two iterations of design, implementation and evaluation took place in an elementary mathematics education methods course. To build the chatbot we qualitatively analyzed the training data, categorized them into the smallest meaningful intents of users, and prepared corresponding responses to each intent. At the final iteration, the refined chatbot adequately covered PSTs' questions and provided realistic responses. We found a pattern of PSTs asking similar questions repeatedly in the conversation data. Through multiple iterations, certain design features could lead to improved questioning patterns and user perceptions, including sequential responses, informing responses, and personalization. Implications, design features, and limitations are discussed.	10.1016/j.compedu.2022.104646	

J. S. Lee	The Effectiveness of Bidirectional Generative Patent Language Models		2022	362		194-199	Artificial Intelligence, Deep Learning, Natural Language Generation, Natural Language Processing, Patent, Computational linguistics, Natural language processing systems, Patents and inventions, Generative model, Human-centric, Language model, Language processing, Natural languages, Training data	Generative patent language models can assist humans to write patent text more effectively. The question is how to measure effectiveness from a human-centric perspective and how to improve effectiveness. In this manuscript, a simplified design of the autocomplete function is proposed to increase effectiveness by more than 10%. With the simplified design, the effectiveness of autocomplete can reach more than 60%, which means that more than 60% of keystrokes can be saved by autocomplete. Since writing patent text does not necessarily start from the beginning to the end, a question is whether the generative model can assist a user no matter where to start writing. To answer the question, the generative models in this manuscript are pre-trained with training data in both directions. The generative models become bidirectional. Since text generation is bidirectional, the calculation of autocomplete effectiveness can be bidirectional and starts from anywhere in the text. After thorough experiments, a key finding is that the autocomplete effectiveness of a model for the same text remains similar no matter where the calculation starts. The finding indicates that such bidirectional models can assist a user at a similar level, no matter where the user starts to write. © 2022 The authors and IOS Press.	10.3233/FAIA220466	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146639814&doi=10.3233%2FFAIA220466&partnerId=40&m5d=f2b24432bc6770b0a743d455e56ebab
X. Li, Xie, S., Ye, Z., Ma, S., Yu, G.	Investigating Patients' Continuation Intention Toward Conversational Agents in Outpatient Departments: Cross-sectional Field Survey	Journal of Medical Internet Research	2022	24	11		chatbot, adult, article, controlled study, conversation, cross-sectional study, demographics, discriminant validity, doctor patient relationship, expectation, female, human, information system, interpersonal communication, major clinical study, male, open ended questionnaire, outpatient department, partial least squares regression, patient attitude, patient satisfaction, personalized medicine, public health, qualitative analysis, questionnaire, self care, structural equation modeling, sustainable development, thematic analysis, voice recognition	Background: Conversational agents (CAs) have been developed in outpatient departments to improve physician-patient communication efficiency. As end users, patients' continuance intention is essential for the sustainable development of CAs. Objective: The aim of this study was to facilitate the successful usage of CAs by identifying key factors influencing patients' continuance intention and proposing corresponding managerial implications. Methods: This study proposed an extended expectation-confirmation model and empirically tested the model via a cross-sectional field survey. The questionnaire included demographic characteristics, multiple-item scales, and an optional open-ended question on patients' specific expectations for CAs. Partial least squares structural equation modeling was applied to assess the model and hypotheses. The qualitative data were analyzed via thematic analysis. Results: A total of 172 completed questionnaires were received, with a 100% (172/172) response rate. The proposed model explained 75.5% of the variance in continuance intention. Both satisfaction ($\beta=0.48$, $P<0.001$) and perceived usefulness ($\beta=0.221$; $P=0.004$) were significant predictors of continuance intention. Patients' extent of confirmation significantly and positively affected both perceived usefulness ($\beta=0.817$; $P<0.001$) and satisfaction ($\beta=0.61$; $P<0.001$). Contrary to expectations, perceived ease of use had no significant impact on perceived usefulness ($\beta=-0.048$; $P=0.37$), satisfaction ($\beta=-0.004$; $P=0.63$), and continuance intention ($\beta=0.026$; $P=0.91$). The following three themes were extracted from the 74 answers to the open-ended question: personalized interaction, effective utilization, and clear illustrations. Conclusions: This study identified key factors influencing patients' continuance intention toward CAs. Satisfaction and perceived usefulness were significant predictors of continuance intention ($P<0.001$ and $P<0.004$, respectively) and were significantly affected by patients' extent of confirmation ($P<0.001$ and $P<0.001$, respectively). Developing a better understanding of patients' continuance intention can help administrators figure out how to facilitate the effective implementation of CAs. Efforts should be made toward improving the aspects that patients reasonably expect CAs to have, which include personalized interactions, effective utilization, and clear illustrations.	10.2196/40681	https://www.embase.com/search/results?subaction=viewrecord&id=12021266107&from=export,http://dx.doi.org/10.2196/40681
J. M. V. Lim, James, V., Yeo, Y. J. E., Low, Y. M., Chew, Y. R., Ganapathy, S.	Neonatal presentations to the paediatric emergency department in Singapore	Singapore medical journal	2022	63	11	667-673	child, hospital discharge, hospital emergency service, hospitalization, human, infant, newborn, retrospective study, Singapore	Introduction: This study aimed to characterize neonatal paediatric emergency department (PED) visits, analyse the main paediatric illnesses and establish associations of these illnesses with the readmission rates and severity of their presentation. Methods: A retrospective analysis of neonates (aged <28 days) presenting to the PEDs of our hospital over seven months was performed. Associations between the clinical and demographic data of admissions to the PED and inpatient admissions were analysed. Results: In total, 1,200 neonates presented during the study period, 79.4% of whom presented at less than 15 days since birth. Length of stay in the PED was less than four hours for 94.0% of the neonates. Predominant triage categories comprised non-P1 cases (97.5%). The main diagnoses at the PED were neonatal jaundice (NNJ; 66.8%) and neonatal pyrexia (NNP; 14.6%), which corresponded to the main diagnoses upon discharge from the hospital: NNJ (68.4%) and NNP (15.6%). 48.2% of neonates were referred from polyclinics or other clinics. 57.7% of the neonates were admitted. Interestingly, 87.0% of the well babies, who presented to the emergency department were brought in owing to parental concerns by the parents themselves, without prior consultation with the doctor. Conclusion: Outpatient management of NNJ can be considered. Caregivers should be provided better education regarding normal physiological characteristics of newborns through standardised educational materials. Other potential avenues for parents to seek medical advice, for example hotlines and Chatbots such as the recently piloted 'Urgent Paediatric Advice Line' online service, should be considered.	10.11622/medj.2021160	https://www.embase.com/search/results?subaction=viewrecord&id=12015972426&from=export,http://dx.doi.org/10.11622/medj.2021160
S. M. Lim, Shau, C. W., Cheng, L., Lau, Y.	Chatbot-Delivered Psychotherapy for Adults With Depressive and Anxiety Symptoms: A Systematic Review and Meta-Regression	Behavior Therapy	2022	53	2	334-347	biomedical software, chatbot, Comprehensive Meta-Analysis 3.0, adult, anxiety disorder, chatbot delivered psychotherapy, clinical examination, clinical trial (topic), confidence interval, covariance, data base, depression, effect size, evidence based medicine, human, meta analysis, problem solving, program effectiveness, psychotherapy, randomized controlled trial (topic), review, statistical significance, statistics, symptom, systematic review, therapy effect, United States	Although psychotherapy is a well-established treatment for depression and anxiety, chatbot-delivered psychotherapy is an emerging field that has yet to be explored in depth. This review aims to (a) examine the effectiveness of chatbot-delivered psychotherapy in improving depressive symptoms among adults with depression or anxiety, and (b) evaluate the preferred features for the design of chatbot-delivered psychotherapy. Eight electronic databases were searched for relevant randomized controlled trials. Meta-analysis and random effects meta-regression was conducted using Comprehensive Meta-Analysis 3.0 software. Overall effect was measured using Hedge's g and determined using z statistics at significance level $p<0.05$. Assessment of heterogeneity was done using I^2 and Q tests. A meta-analysis of 11 trials revealed that chatbot-delivered psychotherapy significantly improved depressive symptoms ($g = 0.54$, 95% confidence interval $[-0.66, -0.42]$, $p<0.001$). Although no significant subgroup differences were detected, results revealed larger effect sizes for samples of clinically diagnosed anxiety or depression, chatbots with an embodiment, a combination of types of input and output formats, less than 10 sessions, problem-solving therapy, off-line play and in different regions of the United States than their counterparts. Meta-regression did not identify significant covariates that had an impact on depressive symptoms. Chatbot-delivered psychotherapy can be adopted in health care institutions as an alternative treatment for depression and anxiety. More high-quality trials are warranted to confirm the effectiveness of chatbot-delivered psychotherapy on depressive symptoms. PROSPERO registration number: CRD42020153332.	10.1016/j.beth.2021.09.007	https://www.embase.com/search/results?subaction=viewrecord&id=12015972426&from=export,http://dx.doi.org/10.1016/j.beth.2021.09.007
Z. Lin, Akin, Hie, B., Zhu, Z., Lu, W., Smetanin, N., Verkuil, R., Kabelli, O., Shmueli, Y., dos Santos Costa, A., Fazel-Zarandi, M., Sercu, T., Candido, S., Rives, A.	Evolutionary-scale prediction of atomic level protein structure with a language model		2022			(Lin Z.; Akin R.; Hie B.; Zhu Z.; Lu W.; Smetanin N.; Verkuil R.; Kabelli O.; Shmueli Y.; Fazel-Zarandi M.; Sercu T.; Candido S.; Rives A.; arives@meta.com) Meta AI, FAIR, United States	amino acid sequence, conformation, human, human experiment, language, metagenomics, prediction	Artificial intelligence has the potential to open insight into the structure of proteins at the scale of evolution. It has only recently been possible to extend protein structure prediction to two hundred million cataloged proteins. Characterizing the structure of the exponentially growing billions of protein sequences revealed by large scale gene sequencing experiments would necessitate a breakthrough in the speed of folding. Here we show that direct inference of structure from primary sequence using a large language model enables an order of magnitude speed-up in high resolution structure prediction. Leveraging the insight that language models learn evolutionary patterns across millions of sequences, we train models up to 158 parameters, the largest language model of proteins to date. As the language models are scaled they learn information that enables prediction of the three-dimensional structure of a protein at the resolution of individual atoms. This results in prediction that is up to 60x faster than state-of-the-art while maintaining resolution and accuracy. Building on this, we present the ESM Metagenomic Atlas. This is the first large-scale structural characterization of metagenomic proteins, with more than 617 million structures. The atlas reveals more than 225 million high confidence predictions, including millions whose structures are novel in comparison with experimentally determined structures, giving an unprecedented view into the vast breadth and diversity of the structures of some of the least understood proteins on earth.	10.1101/2022.07.20.500902	https://www.embase.com/search/results?subaction=viewrecord&id=12015972426&from=export,http://dx.doi.org/10.1101/2022.07.20.500902
Z. H. Lin, Li, G. D., Zeng, X. J., Deng, Y., Zhang, Y., Zhuang, Y. T.	A Stylized Image Caption Approach Based on Cross-Media Disentangled Representation Learning	Jisuanji Xuebao/Chinese Journal of Computers	2022	45	12	2510-2527	Cross-media, Disentangled representation learning, Machine learning, Natural language generation, Stylized image caption, Classification (of information), Computer vision, Convolutional neural networks, Learning algorithms, Learning systems, Linear transformations, Linguistics, Modal analysis, Multilayer neural networks, Natural language processing systems, Signal encoding, Image caption, Language processing, Learn+, Linguistic styles, Machine-learning, Natural languages, Deep learning	The task of stylized image caption aims to generate a natural language description that is semantically related to a given image and consistent with a given linguistic style. Both requirements make this task significantly more difficult than the traditional image caption task. However, with the availability of the large-scale image-text corpora and advances in deep learning techniques of computer vision and natural language processing, stylized image caption research has made significant advances in recent years. Widely adopted neural networks have demonstrated their powerful abilities to handle the complexities and challenges of the stylized image caption task. A typical stylized image caption model is usually an encoder-decoder architecture. The model inputs go through many layers of non-linear transformations, e.g. ReLU layer in the Convolutional Neural Networks (CNNs), to yield latent representations. This makes the latent representations and parameters of model lack interpretability and controllability, which can restrict the understanding of this task and its further improvement. In this paper, we focus on the problem of understanding and controlling the latent representations of linguistic style and factual content in stylized image caption models by learning disentangled representations. Existing disentanglement methods mainly work on single modal data, such as computer vision or natural language processing. However, in stylized image caption, there are two types of media, images and texts, involved to learn a representation that is faithful to the underlying data structure. How to disentangle the latent space of cross-media data still needs to be explored. Inspired by the successful applications of disentangled representation learning on Computer Vision and Natural Language Processing, we propose a novel approach, Disentangled Stylized Image Caption (DSIC), to learn the disentangled representations on unparallel cross-media data. With the help of the VAE framework, two latent space filter modules, style filter and fact filter, are designed to enhance the disentangling performance. These filters slice the latent representation to different segments. Each filter is going to retain the style-specific or fact-specific information in the image, by minimizing the proposed auxiliary classifier loss, and screen out other irrelevant information by another auxiliary discriminator loss. Concretely, we use two modules, D-images and D-Captions, to disentangle the stylistic and factual latent information in the images and captions respectively. To fully utilize obtained cross-media disentangled latent information from both images and captions, we adopt an aggregation method using capsule network with routing-by-agreement. This makes it possible for the LSTM based caption generator to generate stylized captions with target linguistic styles by directly controlling the learnt latent vectors. To validate the effectiveness of our approach, we conduct two groups of experiments: the disentanglement performance test and the stylized image caption test, on two popular public image caption datasets, SentCap and FlickrStyle10K. Experimental results for disentanglement performance show that our model can successfully disentangle the stylistic and factual information and reveal that style information existing in both human beings' recent developments in AI programming allow for new applications: individualized chatbots which mimic the speaking and writing behaviour of one specific living or dead person. 'Deathbots', chatbots of the dead, have already been implemented and are currently under development by the first start-up companies. Thus, it is an urgent issue to consider the ethical implications of deathbots. While previous ethical theories of deathbots have always been based on considerations of the dignity of the deceased, I propose to shift the focus on the dignity and autonomy of the bereaved users of deathbots. Drawing on theories of internet-scaffolded affectivity and on theories of grief, I argue that deathbots may have a negative impact on the grief process of bereaved users and therefore have the potential to limit the emotional and psychological wellbeing of their users. Deathbot users are likely to become dependent on their bots which may make them susceptible to surreptitious advertising by deathbot providing companies and may limit their autonomy. At the same time, deathbots may prove to be helpful for people who suffer from prolonged, severe grief processes. I caution against the unrestricted usage of deathbots and suggest that they should be classified as medical devices. This classification would not the least mean that their non-harm, as well as their helpfulness for people suffering from prolonged grief needs to be proven and that their potential for autonomy infringements is reduced. © 2022, The Author(s).	10.11897/SP.J.1016.2022.02510	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144576672&doi=10.11897%2FSP.J.1016.2022.02510&partnerId=40&m5d=217a57994d0a160553047299314518
N. F. Lindemann	The Ethics of 'Deathbots'	Science and Engineering Ethics	2022	28	6		Chatbots, Death, Deathbots, Ethics of AI, Grief, advertising, anxiety, emotion, ethical theory, human, morality, Emotions, Humans, Morals	Recent developments in AI programming allow for new applications: individualized chatbots which mimic the speaking and writing behaviour of one specific living or dead person. 'Deathbots', chatbots of the dead, have already been implemented and are currently under development by the first start-up companies. Thus, it is an urgent issue to consider the ethical implications of deathbots. While previous ethical theories of deathbots have always been based on considerations of the dignity of the deceased, I propose to shift the focus on the dignity and autonomy of the bereaved users of deathbots. Drawing on theories of internet-scaffolded affectivity and on theories of grief, I argue that deathbots may have a negative impact on the grief process of bereaved users and therefore have the potential to limit the emotional and psychological wellbeing of their users. Deathbot users are likely to become dependent on their bots which may make them susceptible to surreptitious advertising by deathbot providing companies and may limit their autonomy. At the same time, deathbots may prove to be helpful for people who suffer from prolonged, severe grief processes. I caution against the unrestricted usage of deathbots and suggest that they should be classified as medical devices. This classification would not the least mean that their non-harm, as well as their helpfulness for people suffering from prolonged grief needs to be proven and that their potential for autonomy infringements is reduced. © 2022, The Author(s).	10.1007/s11948-022-00417-x	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142513906&doi=10.1007%2F11948-022-00417-x&partnerId=40&m5d=7091c7a83806f0a16055304241649eda

A Chatbot to Support Young People During the COVID-19 Pandemic in New Zealand: Evaluation of the Real-World Rollout of an Open Trial	Journal of Medical Internet Research	2022	24	11	chatbot, adolescent, adult, anxiety, article, cognitive behavioral therapy, coronavirus disease 2019, evidence based practice, female, human, information processing, lockdown, male, mental health, New Zealand, pandemic, positive psychology, questionnaire, social interaction, social support, stay-at-home order	Background: The number of young people in New Zealand (Aotearoa) who experience mental health challenges is increasing. As those in Aotearoa went into the initial COVID-19 lockdown, an ongoing digital mental health project was adapted and underwent rapid content authoring to create the Aroha chatbot. This dynamic digital health project was designed with and for young people to help manage pandemic-related worry. Objective: Aroha was developed to provide practical evidence-based tools for anxiety management using cognitive behavioral therapy and positive psychology. The chatbot included practical ideas to maintain social and cultural connection, and to stay active and well. Methods: Stay-at-home orders under Aotearoa's lockdown commenced on March 20, 2020. By leveraging previously developed chatbot technology and broader existing online trial infrastructure, the Aroha chatbot was launched promptly on April 7, 2020. Dissemination of the chatbot for an open trial was via a URL, and feedback on the experience of the lockdown and the experience of Aroha was gathered via online questionnaires and a focus group, and from community members. Results: In the 2 weeks following the launch of the chatbot, there were 293 registrations, and 238 users logged into the chatbot, of whom 127 were in the target age range (13-24 years). Feedback guided iterative and responsive content authoring to suit the dynamic situation and motivated engineering to dynamically detect and react to a range of conversational intents. Conclusions: The experience of the implementation of the Aroha chatbot highlights the feasibility of providing timely event-specific digital mental health support and the technology requirements for a flexible and enabling chatbot architectural framework.	10.2196/38743	https://www.embase.com/search/results?subaction=viewrecord&id=L2021266101&from=export,http://dx.doi.org/10.2196/38743		
D. H. A. Mai, Nguyen, L. T., Lee, E. Y.	TSSNote-CyPromBERT: Development of an integrated platform for highly accurate promoter prediction and visualization of <i>Synechococcus</i> sp. and <i>Synechocystis</i> sp. through a state-of-the-art natural language processing model BERT	Frontiers in Genetics	2022	13		genomic DNA, transcription factor, article, cyanobacterium, decision making, deep learning, DNA sequence, <i>Escherichia coli</i> , <i>Eubacterium limosum</i> , human, natural language processing, prediction, promoter region, protein-DNA interaction, protein-protein interaction, RNA sequencing, <i>Synechococcus</i> , <i>Synechococcus elongatus</i> , <i>Synechocystis</i>	Since the introduction of the first transformer model with a unique self-attention mechanism, natural language processing (NLP) models have attained state-of-the-art (SOTA) performance on various tasks. As DNA is the blueprint of life, it can be viewed as an unusual language, with its characteristic lexicon and grammar. Therefore, NLP models may provide insights into the meaning of the sequential structure of DNA. In the current study, we employed and compared the performance of popular SOTA NLP models (i.e., xLNet, BERT, and a variant DNABERT trained on the human genome) to predict and analyze the promoters in freshwater cyanobacterium <i>Synechocystis</i> sp. PCC 6803 and the fastest growing cyanobacterium <i>Synechococcus elongatus</i> sp. UTEX 2973. These freshwater cyanobacteria are promising hosts for phototrophically producing value-added compounds from CO ₂ . Through a custom pipeline, promoters and non-promoters from <i>Synechococcus elongatus</i> sp. UTEX 2973 were used to train the model. The trained model achieved an AUROC score of 0.97 and F1 score of 0.92. During cross-validation with promoters from <i>Synechocystis</i> sp. PCC 6803, the model achieved an AUROC score of 0.96 and F1 score of 0.91. To increase accessibility, we developed an integrated platform (TSSNote-CyPromBERT) to facilitate large dataset extraction, model training, and promoter prediction from public cDNA-seq datasets. Furthermore, various visualization tools have been incorporated to address the "black box" issue of deep learning and feature analysis. The learning transfer ability of large language models may help identify and analyze promoter regions for newly isolated strains with similar lineages.	10.3389/fgene.2022.1067562	https://www.embase.com/search/results?subaction=viewrecord&id=L2020574732&from=export,http://dx.doi.org/10.3389/fgene.2022.1067562	
S. Manghani	Notes on Structuralism: Introduction	Theory, Culture and Society	2022	39	07. Aug	117-131	AI statistical turn, Claude Lévi-Strauss, Jonathan Culler, Mary Douglas, narrative, Roland Barthes, structuralism	This commentary introduces a section of the journal titled 'Notes on Structuralism'. It centres around two interviews. The first, from 1987, is with the structural anthropologist Mary Douglas (who speaks on various aspects of her work, including on Purity and Danger). The second is an interview with Roland Barthes, who, speaking in 1965, was at the height of his structuralist phase. The interview focuses upon the structural analysis of narrative and prefigures the well-known volume of <i>Communications</i> on the subject. The interviews are supplemented with introductions and a commentary on Barthes' interview by Jonathan Culler, who contextualizes the development of Barthes' thinking around narrative (as it leads to the publication of <i>S/Z</i>). The article concludes with reflections on structuralism with regards to contemporary practices of big data, AI and large language models. © The Author(s) 2022.	10.1177/02632764221141823	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8514779579&doi=10.1177/02632764221141823&partnerId=40&md5=2c00059a26545e936f46908e9e968b
D. Manna, De Sarkar, T.	Sustainable development initiatives in libraries: A critical analysis	ANNALS OF LIBRARY AND INFORMATION STUDIES	2022	69	4	282-293	Acoustic management, Carbon footprint, Chatbot, Crowd funding, Energy Conservation, Green library, Robotics, Sensor, Sustainable goals, GREEN, SERVICES	The purpose of the present study is to give an overview of the sustainable development (SD) initiatives observed among the selected libraries around the world. The present study employed a web-based content analysis method among the selected academic and public libraries to investigate the adherence of features of the green library. Based on the survey of library websites and reviewing related literature, the study identified the parameters contributing to the sustainable development intent of the library. With examples, this study also showcases the current practices followed by the libraries to implement green library strategy. Moreover, the challenges faced by the libraries in their effort to go green was also identified and discussed. The overview of SD initiatives among different libraries as displayed in the study will improve the understanding of the adoption of green indicators by the librarians and information science professionals.	10.56402/aliv.69i4.60044	
M. S. Marcolino, Diniz, C. S., Chagas, B. A., Mendes, M. S., Prates, R., Pagano, A., Ferreira, T. C., Moreira Alkmin, M. B., Alves Oliveira, C. R., Borges, I. N., Raposo, M. C., Nogueira Reis, Z. S., Paixão, M. C., Ribeiro, L. B., Rocha, G. M., Cardoso, C. S., Pinho Ribeiro, A. L.	Synchronous Teleconsultation and Monitoring Service Targeting COVID-19: Leveraging Insights for Postpandemic Health Care	JMIR Medical Informatics	2022	10	12	COVID-19, delivery of health care, digital health, mobile health, primary health care, public health, remote care, remote consultation, telehealth, telemedicine, telemonitoring, text message, usability	Background: Although a great number of teleconsultation services have been developed during the COVID-19 pandemic, studies assessing usability and health care provider satisfaction are still incipient. Objective: This study aimed to describe the development, implementation, and expansion of a synchronous teleconsultation service targeting patients with symptoms of COVID-19 in Brazil, as well as to assess its usability and health care professionals' satisfaction. Methods: This mixed methods study was developed in 5 phases: (1) the identification of components, technical and functional requirements, and system architecture; (2) system and user interface development and validation; (3) pilot-testing in the city of Divinópolis; (4) expansion in the cities of Divinópolis, Teófilo Otoni, and Belo Horizonte for Universidade Federal de Minas Gerais faculty and students; and (5) usability and satisfaction assessment, using Likert-scale and open-ended questions. Results: During pilot development, problems contacting users were solved by introducing standardized SMS text messages, which were sent to users to obtain their feedback and keep track of them. Until April 2022, the expanded system served 31,966 patients in 146,158 teleconsultations. Teleconsultations were initiated through chatbot in 27.7% (40,486/146,158) of cases. Teleconsultation efficiency per city was 93.7% (13,317/14,212) in Teófilo Otoni, 92.4% (11,747/12,713) in Divinópolis, and 98.8% (4981/5041) in Belo Horizonte (university campus), thus avoiding in-person assistance for a great majority of patients. In total, 50 (83%) out of 60 health care professionals assessed the system's usability as satisfactory, despite a few system instability problems. Conclusions: The system provided updated information about COVID-19 and enabled remote care for thousands of patients, which evidenced the critical role of telemedicine in expanding emergency services capacity during the pandemic. The dynamic nature of the current pandemic required fast planning, implementation, development, and updates in the system. Usability and satisfaction assessment was key to identifying areas for improvement. The experience reported here is expected to inform telemedicine strategies to be implemented in a postpandemic scenario. © 2022 JMIR Publications Inc.. All right reserved.	10.2196/37591	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145391653&doi=10.2196/37591&partnerId=40&md5=03185e1169a7425c8e880ed94972e2	
M. S. Marcolino, Diniz, C. S., Chagas, B. A., Mendes, M. S., Prates, R., Pagano, A., Ferreira, T. C., Alkmin, M. B. M., Oliveira, C. R. A., Borges, I. N., Raposo, M. C., Reis, Z. S. N., Paixão, M. C., Ribeiro, L. B., Rocha, G. M., Cardoso, C. S., Ribeiro, A. L. P.	Synchronous Teleconsultation and Monitoring Service Targeting COVID-19: Leveraging Insights for Postpandemic Health Care	JMIR MEDICAL INFORMATICS	2022	10	12	COVID-19, telemonitoring, remote consultation, telemedicine, primary health care, delivery of health care, telehealth, text message, mobile health, public health, remote care, digital health, usability, TELEPHONE, QUALITY, ACCESS	Background: Although a great number of teleconsultation services have been developed during the COVID-19 pandemic, studies assessing usability and health care provider satisfaction are still incipient. Objective: This study aimed to describe the development, implementation, and expansion of a synchronous teleconsultation service targeting patients with symptoms of COVID-19 in Brazil, as well as to assess its usability and health care professionals' satisfaction. Methods: This mixed methods study was developed in 5 phases: (1) the identification of components, technical and functional requirements, and system architecture; (2) system and user interface development and validation; (3) pilot-testing in the city of Divinópolis; (4) expansion in the cities of Divinópolis, Teófilo Otoni, and Belo Horizonte for Universidade Federal de Minas Gerais faculty and students; and (5) usability and satisfaction assessment, using Likert-scale and open-ended questions. Results: During pilot development, problems contacting users were solved by introducing standardized SMS text messages, which were sent to users to obtain their feedback and keep track of them. Until April 2022, the expanded system served 31,966 patients in 146,158 teleconsultations. Teleconsultations were initiated through chatbot in 27.7% (40,486/146,158) of cases. Teleconsultation efficiency per city was 93.7% (13,317/14,212) in Teófilo Otoni, 92.4% (11,747/12,713) in Divinópolis, and 98.8% (4981/5041) in Belo Horizonte (university campus), thus avoiding in-person assistance for a great majority of patients. In total, 50 (83%) out of 60 health care professionals assessed the system's usability as satisfactory, despite a few system instability problems. Conclusions: The system provided updated information about COVID-19 and enabled remote care for thousands of patients, which evidenced the critical role of telemedicine in expanding emergency services capacity during the pandemic. The dynamic nature of the current pandemic required fast planning, implementation, development, and updates in the system. Usability and satisfaction assessment was key to identifying areas for improvement. The experience reported here is expected to inform telemedicine strategies to be implemented in a postpandemic scenario. (JMIR Med Inform. 2022;10(12):e37591) doi: 10.2196/37591	10.2196/37591		
L. Martinego, Lum, E., Car, J.	Evaluation of chatbot-delivered interventions for self-management of depression: Content analysis	J Affect Disord	2022	319		598-607	Humans, "Self-Management, Depression/therapy, Anxiety Disorders/therapy, Mental Health, Anxiety/therapy, Chatbot, Content analysis, Conversational agent, Depression, Digital health, Mood disorders, mHealth	BACKGROUND: Conversational agents (CAs) or chatbots are increasingly used for depression, anxiety, and wellbeing management. CAs are considered acceptable and helpful. However, little is known about the adequacy of CA responses. This study assessed the structure, content, and user-customization of mental health CA dialogues with users with depression or at risk of suicide. METHODS: We used content analysis to examine the dialogues of CAs previously included in three assessments of mental health apps (depression education, self-guided cognitive behavioural therapy, and suicide prevention) performed between 2019 and 2020. Two standardized user personas with depression were developed to interact with the CA. All conversations were saved as screenshots, transcribed verbatim, and coded inductively. RESULTS: Nine CAs were included. Seven CAs (78%) had Android and iOS versions; five CAs (56%) had at least 500,000 downloads. The analysis generated eight categories: self-introduction, personalization, appropriateness of CA responses, conveying empathy, guiding users through mood-boosting activities, mood monitoring, suicide risk management, and others. CAs could engage in empathic, non-judgemental conversations with users, offer support, and guide psychotherapeutic exercises. LIMITATIONS: CA evaluations were performed using standardized personas, not real-world users. CAs were included for evaluation only if retrieved in the search strategies associated with the previous assessment studies. CONCLUSION: Assessed CAs offered anonymous, empathic, non-judgemental interactions that align with evidence for face-to-face psychotherapy. CAs from app stores are not suited to provide comprehensive suicide risk management. Further research should evaluate the effectiveness of CA-led interventions in mental health care and in enhancing suicide risk management strategies.	10.1016/j.jad.2022.09.028	
A. McStay	Replica in the Metaverse: the moral problem with empathy in 'It from Bit'	AI Ethics	2022			Jan 13	Augmented reality, Chatbot, Empathy, Metaverse, Mixed reality, Replika, Xiaoice, interests to disclose and no competing interests to declare.	This paper assesses claims of computational empathy in relation to existing social open-ended chatbots and intention that these chatbots will feature in emergent mixed reality contexts, recently given prominence due to interest in the Metaverse. Against the background of increasing loneliness within society and use of chatbots as a potential remedy for this, the paper considers two leading current social chatbots, Replika and Microsoft's Xiaoice, their technical underpinnings, empathetic claims and properties that have scope to scale into the Metaverse (if it coheres). Finding scope for human benefit from social chatbots, the paper highlights problematic reliance on self-disclosure to sustain the existence of chatbots. The paper progresses to situate Microsoft's empathetic computing framework in relation to philosophical ideas that inform Metaverse speculation and construction, including Wheeler's 'It from Bit' thesis that all aspects of existence may be computed, Chalmers' philosophical championing that virtual realities are genuine realities, Bostrom's proposal and provocation that we might already be living in a simulation, and longstanding belief that future complex simulations need to be protected from decisions made today. Given claims for current and nascent social chatbots, belief in bit-based possible and projected futures, and industrial buy-in to these philosophies, this paper answers whether computational empathy is real or not. The paper finds when diverse accounts of empathy are accounted for, whilst something is irrevocably lost in an 'It from Bit' account of empathy, the missing components are not accuracy or even human commonality of experience, but the moral dimension of empathy.	10.1007/9781681-022-00252-7	

B. Meynard-Piganeau, Fabbri, C., Weigt, M., Pagnani, A., Feinauer, C.	Generating Interacting Protein Sequences using Domain-to-Domain Translation		2022		(Meynard-Piganeau B.; Fabbri C.; Feinauer C.; christopher.feinauer@unibocon.it)	Depart ment of Computing Sciences Bocconi Institute for Data Science and Analytics (BIDSA).	amino acid sequence, human, human experiment, language, protein domain	Motivation: Being able to artificially design novel proteins of desired function is pivotal in many biological and biomedical applications. Generative statistical modeling has recently emerged as a new paradigm for designing amino acid sequences, including in particular models and embedding methods borrowed from Natural Language Processing (NLP). However, most approaches target single proteins or protein domains, and do not take into account any functional specificity or interaction with the context. To extend beyond current computational strategies, we develop a method for generating protein domain sequences intended to interact with another protein domain. Using data from natural multi-domain proteins, we cast the problem as a translation problem from a given interactor domain to the new domain to be generated, i.e. we generate artificial partner sequences conditional on an input sequence. Results: Evaluating our model's quality using diverse metrics, in part related to distinct biological questions, we show that our method outperforms state-of-the-art shallow auto-regressive strategies. We also explore the possibility of fine-tuning pre-trained large language models for the same task and of using AlphaFold 2 for assessing the quality of sampled sequences.	10.1101/2022.05.30.494026	https://www.ebmase.com/search/results?subaction=viewrecord&id=120222410178.from-export,http://dx.doi.org/10.1101/2022.05.30.494026
A. Miao, Kadoglou, N., Mishra, N., Whittington, P., Dogan, H.	A Usability Evaluation of YouDiagnose: Artificial Intelligence Powered Physician Consultation		2022		(Miao A., drawini@gmail.com)	YousDiagnose Limited, United Kingdom	adult, artificial intelligence, automation, cancer risk, chatbot, clinical assessment, consultation, exercise, human, patient triage, physician, quantitative analysis, questionnaire, rating scale, usability	The COVID-19 Pandemic has resulted in a forced transition to telemedicine, where history-taking and clinical assessments are performed remotely during video or telephonic consultations. While telemedicine has added to safety and social distancing during the pandemic, the manual and resource-intensive process of telephonic and video consultations has not helped to ease the patient backlog, rather has added to this snowballing issue. This paper describes about YouDiagnose pre-consultation exercise that automates patient triage and clinical assessment using artificial intelligence technologies delivered through either a Smart Questionnaire or Chatbot. A usability evaluation was conducted with participants from the Patient and Public Involvement and Engagement Senate (PIES) of the Innovation Agency (an Academic Health Science Network) Qualitative feedback was obtained from the participants on both modalities and quantitative feedback in the form of the System Usability Scale (SUS), comparing the usability of both interaction modalities. The SUS scores were analysed using the Adjective Rating Scale that revealed the Smart Questionnaire had 'Good Usability' compared to 'OK Usability' of the Chatbot. The results shows the user experience and untapped potential of process automation and artificial intelligence in clinical services.	10.1101/2022.12.20.22283710	https://www.ebmase.com/search/results?subaction=viewrecord&id=120220756438.from-export,http://dx.doi.org/10.1101/2022.12.20.22283710
O. Mohamed, Kassem, A. M., Ashraf, H., Mohamed, E. H.	An ensemble transformer-based model for Arabic sentiment analysis	SOCIAL NETWORK ANALYSIS AND MINING	2022	13	1		NLP, Arabic text, Sentiment analysis, Ensemble learning, Transformers, BERT	Sentiment analysis is a common and challenging task in natural language processing (NLP). It is a widely studied area of research; it facilitates capturing public opinions about a topic, product, or service. There is much research that tackles English sentiment analysis. However, the research in the Arabic language is behind other high-resource languages. Recently, models such as bidirectional encoder representations from transformers (BERT) and generative pre-trained transformer (GPT) have been widely used in many NLP tasks; it significantly improved performance in NLP tasks, especially sentiment analysis. However, Arabic was not a priority in their development. Several models focusing on Arabic have recently begun to pave the way for the latest technologies, such as ARBERT, MARBERT, and others. We used multiple datasets for training and testing-ASAD-A Twitter-based Benchmark Arabic Sentiment Analysis Dataset, ArSarcasm-v2, and SemEval-2017. We propose an ensemble learning approach that combines the multilingual model (XLM-T) and the monolingual model (MARBERT) to overcome the intricacies of the Arabic language that are difficult to address with a single model. It also addresses the problem of imbalanced data using a combination of focal loss and label smoothing. The experiments showed that our ensemble learning approach outperforms the state-of-the-art models on all the used datasets.	10.1007/978-1322-01009-0	
J. A. Moldt, Festl-Wietek, T., Mamlouk, A. M., Hermann, Werner, A.	Assessing medical students' perceived stress levels by comparing a chatbot-based approach to the Perceived Stress Questionnaire (PSQ20) in a mixed-methods study	Digital Health	2022		8		communication, conversational agent, Medical students, mixed-methods design, PSQ20, stress	Objective: Digital transformation in higher education has presented medical students with new challenges, which has increased the difficulty of organising their own studies. The main objective of this study is to evaluate the effectiveness of a chatbot in assessing the stress levels of medical students in everyday conversations and to identify the main condition for accepting a chatbot as a conversational partner based on validated stress instruments, such as the Perceived Stress Questionnaire (PSQ20). Methods: In this mixed-methods research design, medical-student stress level was assessed using a quantitative (digital- and paper-based versions of PSQ20) and qualitative (chatbot conversation) study design. PSQ20 items were also shortened to investigate whether medical students' stress levels can be measured in everyday conversations. Therefore, items were integrated into the chat between medical students and a chatbot named Melinda. Results: PSQ20 revealed increased stress levels in 43.4% of medical students who participated (N = 136). The integrated PSQ20 items in the conversations with Melinda obtained similar subjective stress degree results in the statistical analysis of both PSQ20 versions. Qualitative analysis revealed that certain functional and technical requirements have a significant impact on the expected use and success of the chatbot. Conclusion: The results suggest that chatbots are promising as personal digital assistants for medical students; they can detect students' stress factors during the conversation. Increasing the chatbot's technical and social capabilities could have a positive impact on user acceptance. © The Author(s) 2022.	10.1177/2055207622113902	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142719187&doi=10.1177/2055207622113902&partnerId=40&md5=4465f331106c1d6989289a8ba54def
Q. Motger, Franck, X., Marco, J.	Software-Based Dialogue Systems: Survey, Taxonomy, and Challenges	ACM Computing Surveys	2022	55	5		chatbots, Conversational agents, systematic literature review, Human computer interaction, Industrial research, Natural language processing systems, Recurrent neural networks, Speech processing, 'current, Context-Aware, Dialogue systems, Learning approach, Natural language interfaces, State of research, System survey, Taxonomies	The use of natural language interfaces in the field of human-computer interaction (HCI) is undergoing intense study through dedicated scientific and industrial research. The latest contributions in the field, including deep learning approaches, have brought recurrent neural networks (RNNs), the potential of context-aware strategies and user-centred design approaches, have brought back the attention of the community to software-based dialogue systems, generally known as conversational agents or chatbots. Nonetheless, and given the novelty of the field, a generic, context-independent overview of the current state of research on conversational agents covering all research perspectives involved is missing. Motivated by this context, this article reports a survey of the current state of research of conversational agents through a systematic literature review of secondary studies. The conducted research is designed to develop an exhaustive perspective through a clear presentation of the aggregated knowledge published by recent literature within a variety of domains, research focuses and contexts. As a result, this research proposes a holistic taxonomy of the different dimensions involved in the conversational agents' field, which is expected to help researchers and to lay the groundwork for future research in the field of natural language interfaces. © 2022 Copyright held by the owner/author(s). Publication rights licensed to ACM.	10.1145/3527450	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85135541182&doi=10.1145/3527450&partnerId=40&md5=bee2f7d3d1f14c17ec3ade4526c95
J. Ng, Haller, E., Murray, A.	The ethical chatbot: A viable solution to socio-legal issues	Alternative Law Journal	2022	47	4	308-313	alternative dispute resolution, artificial intelligence, chatbot, lawyers and the legal system, legal services, online/cyber law, public interest, sociology	Chatbots are becoming important today because of their various technical functions. They are commonly known for providing legal guidance on processes and general information. However, chatbots can also help solve issues of social disconnectedness. This article takes a wide view of the various types of chatbot that deal with socio-legal issues, with a focus on the use of chatbots by organisations that provide certain forms of legal services, such as community legal services. It highlights the chatbot's ability to create a social impact, while ensuring adherence to rules of legal ethics and principles of ethics in Artificial Intelligence. © The Author(s) 2022.	10.1177/1037969X221113598	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85134339989&doi=10.1177/1037969X221113598&partnerId=40&md5=4c1ca2132099ea76541af2bec35598
H. Nieminen, Kuosmanen, L., Bond, R., Vartiainen, A. K., Muukkonen, M., Potts, C., Kosterinen, C.	Coproducing multilingual conversational scripts for a mental wellbeing chatbot - where domain experts become chatbot designers	European Psychiatry	2022	65		S293	chatbot, conference abstract, controlled study, conversation, human, human experiment, language, mental health, mental health care personnel, practice guideline, psychological well-being	Introduction: Digital mental health interventions, such as chatbots that promote mental health and wellbeing are a promising way to deliver low-threshold support 24/7 for those in need. According to current knowledge about the topic, health care professionals should participate in the design and development processes for digital interventions. Objectives: The aim of this presentation is to describe the interdisciplinary content development process of the ChatPal chatbot. Methods: The content development process started in co-operation with mental health professionals and potential users to identify requirements. Content was created, evaluated and tested in international, multi-disciplinary group workshops, and online tools were used to allow the collaboration. Initial conversational scripts were drafted in English, and translated into Finnish, Swedish and Scottish Gaelic. Results: A multilingual chatbot was developed and the conversation scripts were structured and stored using a spreadsheet. The conversation scripts will be made freely available online in due course using this structured approach to formatting chatbot dialogues repurposing the content as well as facilitating studies that wish to assess the design of conversation scripts for mental health chatbots. Conversation design process also highlighted some challenges in turning empathetic and supportive conversations to short utterances suitable for a chatbot. Conclusions: The ChatPal chatbot is now available in four languages. As literature about the topic is still scarce, it is important to describe and document the content development processes of mental health chatbots. Future work will develop a conversational UX toolkit that would allow health professionals to design chatbot scripts using design guidelines.	10.1192/j.eurpsy.2022.748	https://www.ebmase.com/search/results?subaction=viewrecord&id=1202157139328.from-export,http://dx.doi.org/10.1192/j.eurpsy.2022.748
A. Nor, Nur, S., Kuter, A. K., Barnabas, R., van Heerden, A.	Radiotherapy Communication Skills Training using Chatbot-Based Prototype (SCIMORT)	Journal of Medical Imaging and Radiation Sciences	2022	53	4	S1	adult, auditory stimulation, blinking, breast cancer, cancer radiotherapy, case report, chatbot, clinical article, clinical practice, communication skill, conference abstract, content validity, controlled clinical trial, critical thinking, Cronbach alpha coefficient, diagnostic imaging, eye movement, female, human, learning, Malaysia, preclinical study, questionnaire, radiotherapy, simulation, voice	Introduction: Effective communication skills are integral to providing adequate patient care and are fundamental to its effectiveness. This is particularly important for radiotherapy students while interacting with patients. Students tend to feel disempowered and inadequate to communicate effectively due to repeated miscommunication between students and patients. For students seeking to develop their abilities, confidence, knowledge, and critical thinking, blended learning-based communication skills training may have been an alternative approach. In this study, a chatbot-based prototype model (SCIMORT module) was designed to effectively improve the communication skills of undergraduates in Diagnostic Imaging and Radiotherapy at Universiti Kebangsaan Malaysia. Methods: SCIMORT was developed in compliance with the Clinical Practice for Radiotherapy course's academic syllabus and learning objectives. SCIMORT was constructed using Blender with final exportation to Bot Libre. The research study is divided into two phases. The first phase focuses on developing the SCIMORT module, while the second phase includes properly evaluating the prototype created in the first phase via a survey questionnaire. Results: The virtual patient created in the first phase was displayed a visual cue (e.g. blinking, eye movement) and auditory cues (e.g. verbal response, intonation of voice). In the second phase, the expert validation of the questionnaire resulted in a high Content Validity Ratio of more than 0.83 percent and a Cronbach Alpha Coefficient of more than 70%. Both the control group's (users' acceptance = 3.919 ± 1.245; users' engagement = 3.526 ± 1.270) and Trial group's (users' acceptance = 3.953 ± 1.114; users' engagement = 3.568 ± 1.142) users' acceptance and engagement with SCIMORT were neutral. Conclusion: The SCIMORT has proven to be an effective and acceptable tool for pre-clinical learning, but with limited levels of engagement. The SCIMORT module should be continually improved by adding elements that make it more interactive and adaptable to student needs.	10.1016/j.jmir.2022.10.005	https://www.ebmase.com/search/results?subaction=viewrecord&id=1202157139328.from-export,http://dx.doi.org/10.1016/j.jmir.2022.10.005
X. Ntinga, Musello, F., Keteer, A. K., van Heerden, A.	The Feasibility and Acceptability of an mHealth Conversational Agent Designed to Support HIV Self-testing in South Africa: Cross-sectional Study	J Med Internet Res	2022	24	12	e39816	Adult, Male, Female, Humans, Adolescent, Young Adult, HIV, Self-Testing, Cross-Sectional Studies, South Africa, HIV Testing, "HIV Infections/diagnosis/therapy, "Telemedicine, Mass Screening, HIV self-testing, HIV, chatbot, conversational agents, mHealth, mobile health, mobile phone	BACKGROUND: HIV testing rates in sub-Saharan Africa remain below the targeted threshold, and primary care facilities struggle to provide adequate services. Innovative approaches that leverage digital technologies could improve HIV testing and access to treatment. OBJECTIVE: This study aimed to examine the feasibility and acceptability of Nolwazi_bot. It is an isiZulu-speaking conversational agent designed to support HIV self-testing (HIVST) in KwaZulu-Natal, South Africa. METHODS: Nolwazi_bot was designed with 4 different personalities that users could choose when selecting a counselor for their HIVST session. We recruited a convenience sample of 120 consenting adults and invited them to undertake an HIV self-test facilitated by the Nolwazi_bot. After testing, participants completed an interviewer-led posttest structured survey to assess their experience with the chatbot-supported HIVST. RESULTS: Participants (N=120) ranged in age from 18 to 47 years, with half of them being men (61/120, 50.8%). Of the 120 participants, 111 (92.5%) had tested with a human counselor more than once. Of the 120 participants, 45 (37.5%) chose to be counseled by the female Nolwazi_bot, personality aged between 18 and 25 years. Approximately one-fifth (21/120, 17.5%) of the participants who underwent an HIV self-test guided by the chatbot tested positive. Most participants (95/120, 79.2%) indicated that their HIV testing experience with a chatbot was much better than that with a human counselor. Many participants (93/120, 77.5%) reported that they felt as if they were talking to a real person, stating that the response tone and word choice of Nolwazi_bot reminded them of how they speak in daily conversations. CONCLUSIONS: The study provides insights into the potential of digital technology interventions to support HIVST in low-income and middle-income countries. Although we wait to see the full benefits of mobile health, technological interventions including conversational agents or chatbots provide us with an excellent opportunity to improve HIVST by addressing the barriers associated with clinic-based HIV testing.	10.2196/39816	

Ntinga, Musielle, F., Keter, A. K., Barnabas, R., Heerden, A. V.	The Feasibility and Acceptability of an mHealth Conversational Agent Designed to Support HIV Self-testing in South Africa: Cross-sectional Study	Journal of Medical Internet Research	2022	24	12	chatbot, computer interface, HIV test, J4, Nlwai_bot, smartphone, acute HIV infection, adult, article, controlled study, conversation, counselor, cross sectional study, female, human, human immunodeficiency virus infection, major clinical study, male, middle aged, pilot study, pre-exposure prophylaxis, program acceptability, program feasibility, self-testing, socioeconomic background, South Africa	Background: HIV testing rates in sub-Saharan Africa remain below the targeted threshold, and primary care facilities struggle to provide adequate services. Innovative approaches that leverage digital technologies could improve HIV testing and access to treatment. Objective: This study aimed to examine the feasibility and acceptability of Nlwai_bot. It is an isiZulu-speaking conversational agent designed to support HIV self-testing (HVST) in KwaZulu-Natal, South Africa. Methods: Nlwai_bot was designed with 4 different personalities that users could choose when selecting a counselor for their HVST session. We recruited a convenience sample of 120 consenting adults and invited them to undertake an HIV self-test facilitated by the Nlwai_bot. After testing, participants completed an interviewer-led posttest structured survey to assess their experience with the chatbot-supported HVST. Results: Participants (N=120) ranged in age from 18 to 47 years, with half of them being men (61/120, 50.8%). Of the 120 participants, 111 (92.5%) had tested with a human counselor more than once. Of the 120 participants, 45 (37.5%) chose to be counseled by the female Nlwai_bot personality aged between 18 and 25 years. Approximately one-fifth (21/120, 17.5%) of the participants who underwent an HIV self-test guided by the chatbot tested positive. Most participants (95/120, 79.2%) indicated that their HIV testing experience with a chatbot was much better than that with a human counselor. Many participants (93/120, 77.5%) reported that they felt as if they were talking to a real person, stating that the response tone and word choice of Nlwai_bot reminded them of how they speak in daily conversations. Conclusions: The study provides insights into the potential of digital technology interventions to support HVST in low-income and middle-income countries. Although we wait to see the full benefits of mobile health, technological interventions including conversational agents or chatbots provide us with an excellent opportunity to improve HVST by addressing the barriers associated with clinic-based HIV testing.	10.2196/39816	https://www.embase.com/search/results?subaction=viewrecord&id=12021954934&from=export , http://dx.doi.org/10.2196/39816	
L. Ogilvie, Prescott, J., Carson, J.	The Use of Chatbots as Supportive Agents for People Seeking Help with Substance Use Disorder: A Systematic Review	European Addiction Research	2022	28	6 405-418	chatbot, computer, mobile application, smartphone, virtual assistant, alcohol, opiate, adult, aged, alcohol abuse, alcohol consumption, Alcohol Use Disorders Identification Test, alcoholism, artificial intelligence, big data, clinical assessment, clinical evaluation, cognitive behavioral therapy, comorbidity, co-occurring, comorbidity, coping behavior, coronavirus disease 2019, data base, depression, digital technology, drug dependence, feedback system, female, follow up, Generalized Anxiety Disorder-7, help seeking behavior, human, male, markup language, mental health, mental health service, mixed method appraisal tool, motivational interviewing, opiate addiction, pandemic, Patient Health Questionnaire	Introduction: The use of chatbots in healthcare is an area of study receiving increased academic interest. As the knowledge base grows, the granularity in the level of research is being refined. There is now more targeted work in specific areas of healthcare, for example, chatbots for anxiety and depression, cancer care, and pregnancy support. The aim of this paper is to systematically review and summarize the research conducted on the use of chatbots in the field of addiction, specifically the use of chatbots as supportive agents for those who suffer from a substance use disorder (SUD). Methods: A systematic search of scholarly databases using the broad search criteria of "drug" OR "alcohol" OR "substance" AND "addiction" OR "dependence" OR "misuse" OR "disorder" OR "abuse" OR harm / AND ("chatbot" OR "bot" OR "conversational agent") with an additional clause applied of "publication date" > January 01, 2016 AND "publication date" < March 27, 2022, identified papers for screening. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were used to evaluate eligibility for inclusion in the study, and the Mixed Methods Appraisal Tool was employed to assess the quality of the papers. Results: The search and screening process identified six papers for full review, two quantitative studies, three qualitative, and one mixed methods. The two quantitative papers considered an adaptation to an existing mental health chatbot to increase its scope to provide support for SUD. The mixed methods study looked at the efficacy of employing a bespoke chatbot as an intervention for harmful alcohol use. Of the qualitative studies, one used thematic analysis to gauge inputs from potential users, and service professionals, on the use of chatbots in the field of addiction, based on existing knowledge, and envisaged solutions. The remaining two were usability studies, one of which focused on how prominent chatbots, such as Amazon Alexa, Apple Siri, and Google Assistant can support people with an SUD and the other on the possibility of delivering a chatbot for opioid-addicted patients that is driven by existing big data. Discussion/Conclusion: The corpus of research in this field is limited, and given the quality of the papers reviewed, it is suggested more research is needed to report on the usefulness of chatbots in this area with greater confidence. Two of the papers reported a reduction in substance use in those who participated in the study. While this is a favourable finding in support of using chatbots in this field, a strong message of caution must be conveyed insofar as expert input is needed to safely leverage existing data, such as big data from social media, or that which is accessed by prevalent market leading chatbots. Without this, serious failings like those highlighted within this review mean chatbots can do more harm than good to their intended audience.	10.1159/000525959	https://www.embase.com/search/results?subaction=viewrecord&id=12021877115&from=export , http://dx.doi.org/10.1159/000525959	
M. Otero-Agra, Jorge-Soto, C., Cusido-Cobos, O. J., Blanco-Prieto, J., Alfaro-Fernández, C., García-Dodríguez, E., Barcala-Furelos, R.	Can a voice assistant help bystanders save lives? A feasibility pilot study chatbot in beta version to assist OHCA bystanders	American Journal of Emergency Medicine	2022	61	169-174	chatbot, manikin, virtual assistant, voice assistant, adult, article, basic life support, breathing, bystander effect (psychology), consciousness, deep learning, emergency health service, graduate, heart arrest, human, layperson, learning algorithm, long term care, machine learning, out of hospital cardiac arrest, pilot study, quasi experimental study, resuscitation, simulation, university student, voice recognition	Objective: Evaluating the usefulness of a chat bot as an assistant during CPR care by laypersons. Methods: Twenty-one university graduates and university students naive in basic life support participated in this quasi-experimental simulation pilot trial. A version beta chatbot was designed to guide potential bystanders who need help in caring for cardiac arrest victims. Through a Question-Answering (Q&A) flowchart, the chatbot uses Voice Recognition Techniques to transform the user's audio into text. After the transformation, it generates the answer to provide the necessary help through machine and deep learning algorithms. A simulation test with a Laerdal Little Anne manikin was performed. Participants initiated the chatbot, which guided them through the recognition of a cardiac arrest event. After recognising the cardiac arrest, the chatbot indicated the start of chest compressions for 2 min. Evaluation of the cardiac arrest recognition sequence was done via a checklist and the quality of CPR was collected with the Laerdal Instructor App. Results: 91% of participants were able to perform the entire sequence correctly. All participants checked the safety of the scene and made sure to call 112. 62% place their hands on the correct compression point. A media time of 158 s (IQR: 146–189) was needed for the whole process. 33% of participants achieved high-quality CPR with a median of 60% in CQPR (IQR: 9–86). Compression depth had a median of 42 mm (IQR: 33–53) and compression rate had a median of 100 compressions/min (IQR: 97–100). Conclusion: The use of a voice assistant could be useful for people with no previous training to perform de out-of-hospital cardiac arrest recognition sequence. Chatbot was able to guide all participants to call 112 and to perform continuous chest compressions. The first version of the chatbot for potential bystanders naive in basic life support needs to be further developed to reduce response times and be more effective in giving feedback on chest compressions.	10.1016/j.ajem.2022.09.013	https://www.embase.com/search/results?subaction=viewrecord&id=12020319525&from=export , http://dx.doi.org/10.1016/j.ajem.2022.09.013	
C. Outeiral, Deane, C. M.	Codon language embeddings provide strong signals for protein engineering		2022			(Outeiral, C., carlos@oouteiral.net; Deane, C.M., deane@stats.ox.ac.uk) Department of Statistics, University of Oxford, 24-29 St Giles', Oxford, United Kingdom	amino acid sequence, codon, deep learning, embedding, genetic transcription, human, human experiment, language, machine learning, melting point, molecular recognition, prediction, protein engineering	Protein representations from deep language models have yielded state-of-the-art performance across many tasks in computational protein engineering. In recent years, progress has primarily focused on parameter count, with recent models' capacities surpassing the size of the very datasets they were trained on. Here, we propose an alternative direction. We show that large language models trained on codons, instead of amino acid sequences, provide high-quality representations that outperform comparable state-of-the-art models across a variety of tasks. In some tasks, like species recognition, prediction of protein and transcript abundance, or melting point estimation, we show that a language model trained on codons outperforms every other published protein language model, including some that contain over 50 times more parameters. These results suggest that, in addition to commonly studied scale and model complexity, the information content of biological data provides an orthogonal direction to improve the power of machine learning in biology.	10.1101/2022.12.15.519894	https://www.embase.com/search/results?subaction=viewrecord&id=12022458718&from=export , http://dx.doi.org/10.1101/2022.12.15.519894
S. Pais, Corderio, J., Jamil, M. L.	NLP-based platform as a service: a brief review	Journal of Big Data	2022	9	1	Big data, Cloud computing, Natural language processing	Natural language processing (NLP) refers to the field of study that focuses on the interactions between human language and computers. It has recently gained much attention for analyzing human language computationally and has spread its applications for various tasks such as machine translation, information extraction, summarization, question answering, and others. With the rapid growth of cloud computing services, merging NLP in the cloud is a significant benefit. It allows researchers to conduct NLP-related experiments on large amounts of data handled by big data techniques while harnessing the cloud's vast, on-demand computing power. However, it has not sufficiently spread its tools and applications as a service in the cloud and there is little literature available that discusses the scope of interdisciplinary work. NLP, cloud Computing, and big data are vast domains and contain their challenges and potentials. By overcoming those challenges and integrating these fields, great potential for NLP and its applications can be unleashed. This paper presents a survey of NLP in cloud computing with a key focus on the comparison of cloud-based NLP services, challenges of NLP and big data while emphasizing the necessity of viable cloud-based NLP services. In the first part of this paper, an overview of NLP is presented by discussing different levels of NLP and components of natural language generation (NLG), followed by the applications of NLP. In the second part, the concept of cloud computing is discussed that highlights the architectural layers and deployment models of cloud computing and cloud-hosted NLP services. In the third part, the field of big data in the cloud is discussed with an emphasis on NLP. Furthermore, information extraction via NLP techniques within big data is introduced. © 2022, The Author(s).	10.1186/40537-022-00603-5	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85129039822&doi=10.1186/40537-022-00603-5&partnerId=40&md5=3819b26fb6c025a4d482f312774459e	
R. Pandey, Gautam, V., Pali, R., Bandhey, H., Dhingra, L. S., Misra, V., Sharma, H., Jain, C., Bhagat, K., Arushi, Patel, L., Agarwal, M., Agrawal, S., Jalan, R., Wadhwa, A., Garg, A., Agrawal, Y., Rana, B., Kumaraguru, P., Sethi, T.	A machine learning application for raising WASH awareness in the times of COVID-19 pandemic	Scientific Reports	2022	12	1	epidemiology, female, global health, human, machine learning, male, natural language processing, pandemic, COVID-19, Disinformation, Humans, Pandemics	The COVID-19 pandemic has revealed the power of internet disinformation in influencing global health. The deluge of information travels faster than the epidemic itself and is a threat to the health of millions across the globe. Health apps need to leverage machine learning for delivering the right information while constantly learning misinformation trends and deliver these effectively in vernacular languages in order to combat the infodemic at the grassroots levels in the general public. Our application, WashKaro, is a multi-pronged intervention that uses conversational Artificial Intelligence (AI), machine translation, and natural language processing to combat misinformation (NLP). Washkaro uses AI to provide accurate information matched against WHO recommendations and delivered in an understandable format in local languages. The primary aim of this study was to assess the use of neural models for text summarization and machine learning for delivering WHO matched COVID-19 information to mitigate the misinformation. The secondary aim of this study was to develop a symptom assessment tool and segmentation insights for improving the delivery of information. A total of 5026 people downloaded the app during the study window; among those, 1545 were actively engaged users. Our study shows that 3.4 times more females engaged with the App in Hindi as compared to males, the relevance of AI-filtered news content doubled within 45 days of continuous machine learning, and the prudence of integrated AI chatbot "Satya" increased thus proving the usefulness of a mHealth platform to mitigate health misinformation. We conclude that a machine learning application delivering bite-sized vernacular audios and conversational AI is a practical approach to mitigate health misinformation. © 2022, The Author(s).	10.1038/s41598-021-03869-6	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85123091271&doi=10.1038/s41598-021-03869-6&partnerId=40&md5=604d173d6f60802057033f749b18bf24c	
S. Pandey, Sharma, S., Wazir, S.	Mental healthcare chatbot based on natural language processing and deep learning approaches: Ted the therapist	International Journal of Information Technology (Singapore)	2022	14	7 3757-3766	Artificial intelligence, Chatbot, Deep learning, Mental health, Natural language processing	Mental disorder is deliberated to be the top cause of Years Lived with Disability (YLD) with over 29% of the population affected. However, there is a shortage of mental healthcare providers and professionals to manage the huge population. Due to the extremely low number of mental healthcare providers available, one-on-one interaction with all the patients is not possible, which affects their treatment process. This effect severely hinders the treatment process which might result in suicidal behaviour and lead to the death of the patients in some cases. Therefore, there is a need for AI (Artificial Intelligence) techniques that help us to solve this issue. In this paper, we propose an AI web-based chatbot called "Ted" to assist people with mental health-related queries with the help of natural language processing and deep learning approaches. The user message is tokenized and pre-processed in this step before being passed to the deep-learning model. Then, to specify the question category, an Artificial Neural Network with Softmax is used. This chatbot will allow the users to interact, use natural language to take input, and generate the appropriate response according to the input. The accuracy of our proposed chatbot is 98.13% in providing the appropriate response. In addition to this, "Ted" will help the patients who are reluctant to speak and get stigmatized by the presence of mental healthcare providers. © 2022, The Author(s), under exclusive licence to Bharati Vidyapeeth's Institute of Computer Applications and Management.	10.1007/s41870-022-00999-6	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8513129851&doi=10.1007/s41870-022-00999-6&partnerId=40&md5=700d77747c2a0460425c1e5f1419387	

Y. Park, Shin, Y.	A Block-Based Interactive Programming Environment for Large-Scale Machine Learning Education	Applied Sciences (Switzerland)	2022	12	24	K-12 education, large-scale training, natural language processing, Scratch, Tooee	The existing block-based machine learning educational environments have a drawback in that they do not support model training based on large-scale data. This makes it difficult for young students to learn the importance of large amounts of data when creating machine learning models. In this paper, we present a novel programming environment in which students can easily train machine learning models based on large-scale data using a block-based programming language. We redefine the interfaces of existing machine learning blocks and also develop an effective model training algorithm suitable for block-based programming languages to enable "instant training" and "large-scale training". As example educational applications based on this environment, we presented what is termed a "Question-Answering Chatbot" program trained on 11,822 text data instances with 7784 classes as well as a "Celebrity Look-Alike" program trained on 4431 image data instances with 7 classes. The experimental results show that teachers and pre-service teachers give high scores on all four evaluation measures for this environment. © 2022 by the authors.	10.3390/app122413008	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144907043&doi=10.3390/app122413008&partnerID=40&md5=80c3930628947e3e80f2e313f79ef06
P. Parmar, Ryu, J., Pandya, S., Sedot, J., Agarwal, S.	Health-focused conversational agents in person-centered care: a review of apps	npj Digital Medicine	2022	5	1	Learning algorithms, Marketing, mHealth, Natural language processing system, Search engines, Chatbots, Context of use, Conversational agents, Evaluation framework, Google plays, Language processing, Mobile app, Natural languages, Processing capability, Quality healthcare, Application programs, geographic distribution, health education, human, machine learning, medical information, mental health, mobile application, natural language processing, patient care, patient counseling, primary medical care, primary prevention, Review, search engine, symptom assessment, web browser	Health-focused apps with chatbots ("healthbots") have a critical role in addressing gaps in quality healthcare. There is limited evidence on how such healthbots are developed and applied in practice. Our review of healthbots aims to classify types of healthbots, contexts of use, and their natural language processing capabilities. Eligible apps were those that were health-related, had an embedded text-based conversational agent, available in English, and were available for free download through the Google Play or Apple iOS store. Apps were identified using 42Matters software, a mobile app search engine. Apps were assessed using an evaluation framework addressing chatbot characteristics and natural language processing features. The review suggests uptake across 33 low- and high-income countries. Most healthbots are patient-facing, available on a mobile interface and provide a range of functions including health education and counselling support, assessment of symptoms, and assistance with tasks such as scheduling. Most of the 78 apps reviewed focus on primary care and mental health, only 6 (7.59%) had a theoretical underpinning, and 10 (12.35%) complied with health information privacy regulations. Our assessment indicated that only a few apps use machine learning and natural language processing approaches, despite such marketing claims. Most apps allowed for a finite-state input, where the dialogue is led by the system and follows a predetermined algorithm. Healthbots are potentially transformative in centering care around the user; however, they are in a nascent state of development and require further research on development, automation and adoption for a population-level health impact. © 2022, The Author(s).	10.1038/s41746-022-00560-6	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85125272316&doi=10.1038/s41746-022-00560-6&partnerID=40&md5=1c56e8b2233669223ca2a7206ff9bb7
S. Pithgornchai yikul, Naorungroj, S., Pupong, K., Humsritakhu n, J.	Using a Chatbot as an Alternative Approach for In-Person Toothbrushing Training During the COVID-19 Pandemic: Comparative Study	Journal of Medical Internet Research	2022	24	10	TCR20191223005, chatbot, article, caregiver, child, clinical effectiveness, controlled study, coronavirus disease 2019, female, human, infant, major clinical study, male, mouth hygiene, pandemic, preschool child, randomized controlled trial (topic), rural area, secondary analysis, tooth brushing, usability, videorecording	Background: It is recommended that caregivers receive oral health education and in-person training to improve toothbrushing for young children. To strengthen oral health education before COVID-19, the 21-day FunDee chatbot with in-person toothbrushing training for caregivers was used. During the pandemic, practical experience was difficult to implement. Therefore, the 30-day FunDee chatbot was created to extend the coverage of chatbots from 21 days to 30 days by incorporating more videos on toothbrushing demonstrations and dialogue. This was a secondary data comparison of 2 chatbots in similar rural areas of Pattani province: Makaan district (Study I) and Maetan district (Study II). Objective: This study aimed to evaluate the effectiveness and usability of 2 chatbots. 21-Day FunDee (Study I) and 30-Day FunDee (Study II), based on the protection motivation theory (PMT). This study explored the feasibility of using the 30-Day FunDee chatbot to increase toothbrushing behaviors for caregivers in oral hygiene care for children aged 6 months to 36 months without in-person training during the COVID-19 pandemic. Methods: A pre-post design was used in both studies. The effectiveness was evaluated among caregivers in terms of oral hygiene practices, knowledge, and oral health care perceptions based on PMT. In Study I, participants received in-person training and a 21-day chatbot course during October 2018 to February 2019. In Study II, participants received only daily chatbot programming for 30 days during December 2021 to February 2022. Data were gathered at baseline of each study and at 30 days and 60 days after the start of Study I and Study II, respectively. After completing their interventions, the chatbot's usability was assessed using open-ended questions. Study I evaluated the plaque score, whereas Study II included an in-depth interview. The 2 studies were compared to determine the feasibility of using the 30-Day FunDee chatbot as an alternative to in-person training. Results: There were 71 pairs of participants: 37 in Study I and 34 in Study II. Both chatbots significantly improved overall knowledge (Study I: P<.001; Study II: P<.001), overall oral health care perceptions based on PMT (Study I: P<.001; Study II: P<.001), and toothbrushing for children by caregivers (Study I: P=.02; Study II: P=.04). Only Study I had statistically significant differences in toothbrushing at least twice a day (P<.002) and perceived vulnerability (P<.003). The highest overall chatbot satisfaction was 5.2 (SD 0.9) in Study I and 8.6 (SD 1.2) in Study II. In Study I, plaque levels differed significantly (P<.001). Conclusions: This was the first study using a chatbot in oral health education. We established the effectiveness and usability of 2 chatbot programs for promoting oral hygiene care of young children by caregivers. The 30-Day FunDee chatbot showed the possibility of improving toothbrushing skills without requiring in-person training.	10.2196/39218	https://www.embase.com/search/results?subaction=viewrecord&id=2021266042&from=export,http://dx.doi.org/10.2196/39218
M. Primé Tous, Ammella, G., Segú, X., Fernández Canseco, M. D. R., Carrión, C., Villegas, M., Vicens, V., Blanch, J., Caverio, M., Vieta, E., Hidalgo-Mazzei, D.	PRESTOapp for health workers with mental health symptoms related to the COVID-19 pandemic	European Psychiatry	2022	65	5575	burnout, chatbot, computer interface, conference abstract, coronavirus disease 2019, feasibility study, health care personnel, human, mental disease, mental health, natural language processing, pandemic, preliminary data, remote sensing	Introduction: The COVID-19 pandemic has caused a significant impact on the mental health of health workers that has brought many hospitals to launch immediate preventive mental health programs. Objectives: (1) To adapt and enhance a smartphone app (PRESTOapp) for health workers with mental health symptoms related to the COVID-19, and (2) to demonstrate its potential effectiveness in significantly reducing anxiety-depressive and PTSD symptoms in this population. We aim to incorporate Natural Language Processing (NLP)-based techniques in a chatbot userinterface that will enable a more personalized and accurate monitoring and intervention. Methods: An 18-months study with a 6-months preliminary phase to adapt PRESTOapp to health workers, enhance it with NLP-based techniques and chatbot user-interface, and evaluate its feasibility, and effectiveness in 12-months. Results: PRESTOapp has the potential to provide a prompt, personalized and integral response to the mental health demand due to the COVID-19. It will help by providing an innovative digital platform, that will allow remote monitoring of the symptoms course, provide brief psychotherapeutic interventions, and detect urgent situations. If the preliminary results of this study point to a potential effectiveness of the intervention, PRESTOapp may be easily adapted to the general population. Conclusions: PRESTOapp may be one of the key digital platforms that may help preventing and treating potentially severe mental health consequences. Considering the unresolved problem of burnout in health workers even before the COVID-19, this project will develop the necessary technology for implementing cost-effective mental health solutions, not only during the pandemic.	10.1152/j.eurpsy.2022.1474	https://www.embase.com/search/results?subaction=viewrecord&id=1639686559&from=export,http://dx.doi.org/10.1152/j.eurpsy.2022.1474
I. W. Puspitasari, Rinawar, F. R., Purnama, W. G., Susiarno, H., Susanti, A. I.	Development of a Chatbot for Pregnant Women on a Posyandu Application in Indonesia: From Qualitative Approach to Decision Tree Method	Informatics	2022	9	4	chatbot, decision tree, mHealth, Posyandu, pregnant women	With the widespread application of digital healthcare, mobile health (mHealth) services are also developing in maternal and child health, primarily through community-based services, such as Posyandu in Indonesia. Patients need media for consultation and decision-making, while health workers are constrained in responding quickly. This study aimed to obtain information from pregnant women and midwives in developing a decision tree model as material for building a semi-automated chatbot. Using an exploratory qualitative approach, semi-structured interviews were conducted through focus group discussions (FGD) with pregnant women (n = 10) and midwives (n = 12) in March 2022. The results showed 38 codes, 15 categories, and 7 subthemes that generated 3 major themes: maternal health education, information on maternal health services, and health monitoring. The decision tree method was applied from these themes based on the needs of users, evidence, and expert sources to ensure quality. In summary, the need to use a semi-automated chatbot can be applied to education about maternal health and monitoring, where severe cases should be provided with non-automated communication with midwives. Applying the decision tree method ensured quality content, supported a clinical decision, and assisted in early detection. Furthermore, future research needs to measure user evaluation. © 2022 by the authors.	10.3390/informatics9040088	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144690871&doi=10.3390/informatics9040088&partnerID=40&md5=181940d25f8496994b7fca644ded6b3
N. Qamar	THE IMPACT OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE DECISION MAKING PROCESSES	Journal of Pharmaceutical Negative Results	2022	13	6393-6399	article, artificial intelligence, commercial phenomena, decision making, decision support system, human, interview, skill, software	The modern business technology is changing the way we operate and function in earlier days. This applies to every department in the company and Human Resources are no exception. This paper gives an insight into AI based HR approaches that is productive in an organization which minimizes the work load in less amount of time. With the help of AI human brain logical thinking is programmed in AI based software such as Qandile, HROne, Darwinbox,Paradox, Humanly, Seekout, etc which makes the work of an HR department easier and more efficient in less span of time. Further in this paper some of the most prominent AI based application is discussed such as Chatbots, Voice assistants, etc. AI deployment is done in five ways such as Start, Decide, Identify, Implement and Roll out. Benefits of AI is also discussed in detail. The main goal of this paper is to know the importance of AI in HR based policy.	10.47750/pnr.2022.13.507.777	https://www.embase.com/search/results?subaction=viewrecord&id=2022055707&from=export,http://dx.doi.org/10.47750/pnr.2022.13.507.777
N. Rebelo, Sanders, L., Li, F., Chow, J. C. L.	Learning the Treatment Process in Radiotherapy Using an Artificial Intelligence-Assisted Chatbot: Development Study	JMIR Form Res	2022	6	12 e39443	artificial intelligence, cancer therapy, chatbot, communication, diagnosis, health care, internet of things, machine learning, medical physics, radiation oncology, radiation treatment process, radiotherapy chain	BACKGROUND: In knowledge transfer for educational purposes, most cancer hospital or center websites have existing information on cancer health. However, such information is usually a list of topics that are neither interactive nor customized to offer any personal touches to people facing dire health crisis and to attempt to understand the concerns of the users. Patients with cancer, their families, and the general public accessing the information are often in challenging, stressful situations, wanting to access accurate information as efficiently as possible. In addition, there is seldom any comprehensive information specifically on radiotherapy, despite the large number of older patients with cancer, to go through the treatment process. Therefore, having someone with professional knowledge who can listen to them and provide the medical information with good will and encouragement would help patients and families struggling with critical illness, particularly during the lingering pandemic. OBJECTIVE: This study created a novel virtual assistant, a chatbot that can explain the radiation treatment process to stakeholders comprehensively and accurately, in the absence of any similar software. This chatbot was created using the IBM Watson Assistant with artificial intelligence and machine learning features. The chatbot or bot was incorporated into a resource that can be easily accessed by the general public. METHODS: The radiation treatment process in a cancer hospital or center was described by the radiotherapy process: patient diagnosis, consultation, and prescription; patient positioning, immobilization, and simulation; 3D-imaging for treatment planning; target and organ contouring; radiation treatment planning; patient setup and plan verification; and treatment delivery. The bot was created using IBM Watson (IBM Corp) assistant. The natural language processing feature in the Watson platform allowed the bot to flow through a given conversation structure and recognize how the user responds based on recognition of similar given examples, referred to as intents during development. Therefore, the bot can be trained using the responses received, by recognizing similar responses from the user and analyzing using Watson natural language processing. RESULTS: The bot is hosted on a website by the Watson application programming interface. It is capable of guiding the user through the conversation structure and can respond to simple questions and provide resources for requests for information that was not directly programmed into the bot. The bot was tested by potential users, and the overall averages of the identified metrics are excellent. The bot can also acquire users' feedback for further improvements in the routine update. CONCLUSIONS: An artificial intelligence-assisted chatbot was created for knowledge transfer regarding radiation treatment process to the patients with cancer, their families, and the general public. The bot that is supported by machine learning was tested, and it was found that the bot can provide information about radiotherapy effectively.	10.2196/39443	

N. Rebelo, Sanders, L., Li, K., Chow, J. C. L.	Learning the Treatment Process in Radiotherapy Using an Artificial Intelligence-Assisted Chatbot: Development Study	JMIR Formative Research	2022	6	12	artificial intelligence, cancer therapy, chatbot, communication, diagnosis, health care, internet of things, machine learning, medical physics, radiation oncology, radiation treatment process, radiotherapy chain	Background: In knowledge transfer for educational purposes, most cancer hospital or center websites have existing information on cancer health. However, such information is usually a list of topics that are neither interactive nor customized to offer any personal touches to people facing dire health crisis and to attempt to understand the concerns of the users. Patients with cancer, their families, and the general public accessing the information are often in challenging, stressful situations, wanting to access accurate information as efficiently as possible. In addition, there is seldom any comprehensive information specifically on radiotherapy, despite the large number of older patients with cancer, to go through the treatment process. Therefore, having someone with professional knowledge who can listen to them and provide the medical information with good will and encouragement would help patients and families struggling with critical illness, particularly during the lingering pandemic. Objective: This study created a novel virtual assistant, a chatbot that can explain the radiation treatment process to stakeholders comprehensively and accurately, in the absence of any similar software. This chatbot was created using the IBM Watson Assistant with artificial intelligence and machine learning features. The chatbot or bot was incorporated into a resource that can be easily accessed by the general public. Methods: The radiation treatment process in a cancer hospital or center was described by the radiotherapy process: patient diagnosis, consultation, and prescription; patient positioning, immobilization, and simulation; 3D-imaging for treatment planning; target and organ contouring; radiation treatment planning; patient setup and plan verification; and treatment delivery. The bot was created using IBM Watson (IBM Corp) assistant. The natural language processing feature in the Watson platform allowed the bot to flow through a given conversation structure and recognize how the user responds based on recognition of similar given examples, referred to as intents during development. Therefore, the bot can be trained using the responses received, by recognizing similar responses from the user and analyzing using Watson natural language processing. Results: The bot is hosted on a website by the Watson application programming interface. It is capable of guiding the user through the conversation structure and can respond to simple questions and provide resources for requests for information that was not directly programmed into the bot. The bot was tested by potential users, and the overall averages of the identified metrics are excellent. The bot can also acquire users' feedback for further improvements in the routine update. Conclusions: An artificial intelligence-assisted chatbot was created for knowledge transfer regarding radiation treatment process to the patients with cancer, their families, and the general public. The bot that is supported by machine learning was tested, and it was found that the bot can provide information about radiotherapy effectively. ©Nathanael Rebelo, Leslie Sanders, Kay Li, James C. L. Chow.	10.2196/39443	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8514557002&doi=10.2196/2739443&partnerID=40&md5=9e5d494ce80b2da5bc086e81a6ab537
B. Richardson, Wikaksana, A.	COMPARISON OF INDOBERT-LITE AND ROBERTA IN TEXT MINING FOR INDONESIAN LANGUAGE QUESTION ANSWERING APPLICATION	International Journal of Innovative Computing, Information and Control	2022	18	6 1719-1734	Fine-tuning, IndoBERT-lite, Indonesian language, Question answering, RoBERTa, SQuAD, Text mining, TyDi QA, Application programs, Data mining, Multimedia systems, Chatbots, Fine tuning, Indonesian languages, Informatics, Text-mining, Web services	Jacob is a voice chatbot application that provides information related to the Informatics Joint Degree program at Universitas Multimedia Nusantara. Jacob is currently designed to be able to do question answering and text mining online in real time for the English language. This study aims to find the best model for question answering and text mining for the Indonesian language and integrated with Jacob as proof of concept. The pre-trained models of IndoBERT-lite and RoBERTa are studied and implemented as a web service. The work includes pre-training and fine-tuning the two models with TyDi QA and Indonesian-translated SQuAD datasets. The goal is to find a model that gives answers in the Indonesian language with the highest accuracy and F-score value. The test and evaluation results indicate that the indobert-lite-squad outperforms the rest for Indonesian question answering and text mining applications. © 2022, IIC International. All rights reserved.	10.24507/ijpic.18.06.1719	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140644583&doi=10.24507/2f2fjpic.18.06.1719&partnerID=40&md5=c315d54ce0b11b1bec6d90f5236692
R. Riedl	Is trust in artificial intelligence systems related to user personality? Review of empirical evidence and future research directions	Electronic Markets	2022	32	4 2021-2051	Artificial Intelligence (AI), Big Five traits, Machine learning (ML), Personality, Review, Trust, Trust propensity	Artificial Intelligence (AI) refers to technologies which support the execution of tasks normally requiring human intelligence (e.g., visual perception, speech recognition, or decision-making). Examples for AI systems are chatbots, robots, or autonomous vehicles, all of which have become an important phenomenon in the economy and society. Determining which AI system to trust and which not to trust is critical, because such systems carry out tasks autonomously and influence human decision making. This growing importance of trust in AI systems has paralleled another trend: the increasing understanding that user personality is related to trust, thereby affecting the acceptance and adoption of AI systems. We developed a framework of user personality and trust in AI systems which distinguishes universal personality traits (e.g., Big Five), specific personality traits (e.g., propensity to trust, general behavioral tendencies (e.g., trust in a specific AI system), and specific behaviors (e.g., adherence to the recommendation of an AI system in a decision-making context). Based on this framework, we reviewed the scientific literature. We analyzed N = 58 empirical studies published in various scientific disciplines and developed a "big picture" view, revealing significant relationships between personality traits and trust in AI systems. However, our review also shows several unexplored research areas. In particular, it was found that prescriptive knowledge about how to design trustworthy AI systems as a function of user personality lag far behind descriptive knowledge about the use and trust effects of AI systems. Based on these findings, we discuss possible directions for future research, including adaptive systems as focus of future design science research. © 2022, The Author(s).	10.1007/s12525-022-00594-4	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142543156&doi=10.1007/97812525-022-00594-4&partnerID=40&md5=3bf596aa4e009f02079525905d125666
I. Rizomyliotis, K. N., Giovanis, A., Konstantoula, K., K., Kostopoulos, I.	"How may I help you today?" The use of AI chatbots in small family businesses and the moderating role of customer affective commitment	Journal of Business Research	2022	153	329-340	AI chatbots, Anthropomorphism, Customer affective commitment, Customer experience, Customer satisfaction, Small family business	In a digitally empowered business world, a growing number of family businesses are leveraging the use of chatbots in an attempt to improve customer experience. This research investigates the antecedents of chatbots' successful use in small family businesses. Subsequently, we determine the effect of two distinctive sets of human-machine communication factors: (i) customer experience and (ii) customer affective commitment. We assess the latter with respect to customer satisfaction. While a form of intimate attachment can occur between customers and small businesses, affective commitment is prevalent in customers' attitudes and could be conflicting with the distant and impersonal nature of chatbot services. Therefore, we also test the moderating role of customers' affective commitment in the relationship between customer experience and customer satisfaction. Data came from 408 respondents, and the results offer an explicit course of action for family businesses to effectively embed chatbot services in their customer communication. The study provides practical and theoretical insights that stipulate the dimensions of chatbots' effective use in the context of small family businesses. © 2022	10.1016/j.jbusres.2022.08.035	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85137083032&doi=10.1016/j.jbusres.2022.08.035&partnerID=40&md5=e4fea102c433c1926057a998b62dc895
M. Rodríguez Arrascaeta, Martínez-Ortigueza, A., Ruiz-González, C., Ropero-Padilla, C., Roman, P., Sánchez-Labraca, N.	Experiences and perceptions of final-year nursing students of using a chatbot in a simulated emergency situation: A qualitative study	Journal of nursing management	2022	30	8 3874-3884	Artificial intelligence, health care delivery, human, nursing student, problem solving, qualitative research	AIM: The aim of this study is to explore the experiences and perceptions of final-year nursing students on the acceptability and feasibility of using a chatbot for clinical decision-making and patient safety. BACKGROUND: The effective and inclusive use of new technologies such as conversational agents or chatbots could support nurses in increasing evidence-based care and decreasing low-quality services. METHODS: A descriptive qualitative study was used through focus group interviews. The data analysis was conducted using a thematic analysis. RESULTS: This study included 114 participants. After our data analysis, two main themes emerged: (i) experiences in the use of a chatbot service for clinical decision-making and (ii) integrating conversational agents into the organizational safety culture. CONCLUSIONS: The findings of our study provide preliminary support for the acceptability and feasibility of adopting SafeBot, a chatbot for clinical decision-making and patient safety. Our results revealed substantial recommendations for refining navigation, layout and content, as well as useful insights to support its acceptance in real nursing practice. IMPLICATIONS FOR NURSING MANAGEMENT: Leaders and managers may well see artificial intelligence-based conversational agents like SafeBot as a potential solution in modern nursing practice for effective problem-solving resolution, innovative staffing and nursing care delivery models at the bedside and criteria for measuring and ensure quality and patient safety.	10.1111/jonm.13630	https://www.embase.com/search/results?subaction=viewrecord&id=L637751354&from=export,http://dx.doi.org/10.1111/jonm.13630
J. Ross, Belgodere, B., Oenhammarakshan, V., Padhi, I., Mroueh, Y., Das, P.	Large-scale chemical language representations capture molecular structure and properties	NATURE MACHINE INTELLIGENCE	2022	4	12		Large language models have recently emerged with extraordinary capabilities, and these methods can be applied to model other kinds of sequence, such as string representations of molecules. Ross and colleagues have created a transformer-based model, trained on a large dataset of molecules, which provides good results on property prediction tasks. Models based on machine learning can enable accurate and fast molecular property predictions, which is of interest in drug discovery and material design. Various supervised machine learning models have demonstrated promising performance, but the vast chemical space and the limited availability of property labels make supervised learning challenging. Recently, unsupervised transformer-based language models pretrained on a large unlabeled corpus have produced state-of-the-art results in many downstream natural language processing tasks. Inspired by this development, we present molecular embeddings obtained by training an efficient transformer encoder model, MolFormer, which uses rotary positional embeddings. This model employs a linear attention mechanism, coupled with highly distributed training, on SMILES sequences of 1.1 billion unlabelled molecules from the PubChem and ZINC datasets. We show that the learned molecular representation outperforms existing baselines, including supervised and self-supervised graph neural networks and language models, on several downstream tasks from ten benchmark datasets. They perform competitively on two others. Further analyses, specifically through the lens of attention, demonstrate that MolFormer trained on chemical SMILES indeed learns the spatial relationships between atoms within a molecule. These results provide encouraging evidence that large-scale molecular language models can capture sufficient chemical and structural information to predict various distinct molecular properties, including quantum-chemical properties.	10.1038/442256-022-00580-7	
K. Roy, Gaur, M., Soltani, M., Rawte, V., Kalyan, A., Sheth, A.	Proknow: Process knowledge for safety constrained and explainable generation for mental health diagnosis assistance	Front Big Data	2022	5	1056728	explainability, mental health, natural language generation, process knowledge, safety, commercial or financial relationships that could be construed as a potential, conflict of interest.	Virtual Mental Health Assistants (VMHAs) are utilized in health care to provide patient services such as counseling and suggestive care. They are not used for patient diagnostic assistance because they cannot adhere to safety constraints and specialized clinical process knowledge (Proknow) used to obtain clinical diagnoses. In this work, we define Proknow as an ordered set of information that maps to evidence-based guidelines or categories of conceptual understanding to experts in a domain. We also introduce a new dataset of diagnostic conversations guided by safety constraints and Proknow that healthcare professionals use (Proknow-data). We develop a method for natural language question generation (NLG) that collects diagnostic information from the patient interactively (Proknow-algo). We demonstrate the limitations of using state-of-the-art large-scale language models (LMs) on this dataset. Proknow-algo incorporates the process knowledge through explicit modeling safety, knowledge capture, and explainability. As computational metrics for evaluation do not directly translate to clinical settings, we involve expert clinicians in designing evaluation metrics that test four properties: safety, logical coherence, and knowledge capture for explainability while minimizing the standard cross entropy loss to preserve distribution semantics-based similarity to the ground truth. LMs with Proknow-algo generated 89% safer questions in the depression and anxiety domain (tested property: safety). Further, without Proknow-algo generations question did not adhere to clinical process knowledge in Proknow-data (tested property: knowledge capture). In comparison, Proknow-algo-based generations yield a 96% reduction in our metrics to measure knowledge capture. The explainability of the generated question is assessed by computing similarity with concepts in depression and anxiety knowledge bases. Overall, irrespective of the type of LMs, Proknow-algo achieved an averaged 82% improvement over simple pre-trained LMs on safety, explainability, and process-guided question generation. For reproducibility, we will make Proknow-data and the code repository of Proknow-algo publicly available upon acceptance.	10.3389/fdata.2022.1056728	
M. Rukhran, Phakda, N., Netniant, P.	Adoption of Environmental Information Chatbot Services Based on the Internet of Educational Things in Smart Schools: Structural Equation Modeling Approach	Sustainability (Switzerland)	2022	14	23	chatbot, environment information, evaluation usage, internet of educational things, smart school, software development, unified theory of acceptance and use of technology, carbon monoxide, education, health and safety, numerical model, student, sustainability	The Internet of Educational Things (IoET) equips chatbots with real-time environmental information monitoring to prevent student and instructor absences and safeguard their health. Individual behavioral intention toward a chatbot service is essential for better understanding the user's experience and acceptance of monitoring environmental elements such as PM2.5, temperature, humidity, and carbon monoxide. This study aims to apply an integration of an extended framework for smart schools developing an environmental information chatbot service (ENICS) and various users' continued behavioral intentions toward the chatbot system based on the unified theory of acceptance and use of technology model to support health and safety in universities. The proposed framework design can incorporate internet of Things architecture to develop and utilize the chatbot services. The key results of the partial least square test largely support the validity of the proposed model and the significant effects of IoET, performance expectation, effort expectation, social influence, facilitating conditions, health and safety, behavioral intention, and use behavior on personal environmental information chatbot utilization. This study's findings add with a better design for environmental system development and understanding the factors influencing an individual's intention to continue using a chatbot service for IoET applications with low-cost information facilities in safe environmental sustainability. © 2022 by the authors.	10.3390/s142315621	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85138290008&doi=10.3390/s142315621&partnerID=40&md5=9699a8d79e346e83e70fab656919f
A. G. Russo, Clario, A., Ponticorvo, S., Di Salle, F., Tedeschi, G., Esposito, F.	Explaining neural activity in human listeners with deep learning via natural language processing of narrative text	Scientific Reports	2022	12	1	article, clinical article, comprehension, deep learning, functional magnetic resonance imaging, human, human experiment, middle temporal gyrus, narrative, natural language processing, posterior cingulate, prediction error, prefrontal cortex, brain mapping, diagnostic imaging, nuclear magnetic resonance imaging, procedures, Humans, Magnetic Resonance Imaging	Deep learning (DL) approaches may also inform the analysis of human brain activity. Here, a state-of-art DL tool for natural language processing, the Generative Pre-trained Transformer version 2 (GPT-2), is shown to generate meaningful neural encodings in functional MRI during narrative listening. Linguistic features of word unpredictability (surprisal) and contextual importance (saliency) were derived from the GPT-2 applied to the text of a 12-min narrative. Segments of variable duration (from 15 to 90 s) were used for the next word, resulting in different sets of neural predictions for functional MRI signals recorded in 27 healthy listeners of the narrative. GPT-2 surprisal, estimating word prediction errors from the artificial network, significantly explained the neural data in superior and middle temporal gyri (bilaterally), in anterior and posterior cingulate cortices, and in the left prefrontal cortex. GPT-2 saliency, weighing the importance of context words, significantly explained the neural data for longer segments in left superior and middle temporal gyri. These results add novel support to the use of DL tools in the search for neural encodings in functional MRI. A DL language model like the GPT-2 may feature useful data about neural processes subserving language comprehension in humans, including next-word context-related prediction. © 2022, The Author(s).	10.1038/441598-022-21782-4	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140636612&doi=10.1038/2f141598-022-21782-4&partnerID=40&md5=9aa9164859c71df6f694b73ac6b71

S. Sayegh-Jodehi, Mukowski-Kiechhof, R., Linke, D., Müller-Birn, C., Rose, M.	Use of Instant Messaging Software in a German Hospital—An Exploratory Investigation among Physicians	International Journal of Environmental Research and Public Health	2022	19	19	adult, article, attitude to health, clinical practice, digital technology, e-mail, Germany, human, human experiment, Likert scale, medical practice, patient satisfaction, physician, privacy, questionnaire, social media, text messaging, thematic analysis, videoconferencing	Internationally, evidence exists that physicians use instant messaging services for communication tasks in everyday clinical practice. However, there are only few data on physicians in Germany in this regard. Therefore, at the initiation of our project "DocTalk-Dialog meets Chatbot: Collaborative Learning and Teaching in the Process of Work", we conducted a stakeholder survey with an exploratory research approach. The aim was to gain initial insights into use of instant messaging software and attitudes towards data security and advantages and disadvantages before implementing a data-secure in-house messaging platform. N = 70 physicians at Charité-Universitätsmedizin Berlin completed an exploratory questionnaire with closed and open-ended questions. Quantitative data were analyzed using descriptive statistics and qualitative data using thematic analysis. The use of messenger software was not widespread in the sample studied. Physicians most frequently used face-to-face contact for communication. On average, up to ten instant messages were exchanged per day, mainly among colleagues, to answer mutual questions, and to send pictures. With a high awareness of privacy-related restrictions among participating physicians, advantages such as fast and uncomplicated communication were also highlighted. An instant messenger solution that complies with the German data protection guidelines is needed and should be investigated in more detail.	10.3390/ijerph191912618	https://www.embase.com/search/results?subaction=viewrecord&id=L2019558367&from=export , http://dx.doi.org/10.3390/ijerph191912618	
S. Sayenju, Aygun, R., Boardman, J., Don, D. P., Confusion Bias in Franks, B., Johnston, S., Lee, G., Sullivan, D., Modgil, G.	Quantification and Mitigation of Directional Pairwise Class Confusion Bias in a Chatbot Intent Classification Model	International Journal of Semantic Computing	2022	16	4	497-520	bias mitigation, chatbots, directional pairwise class confusion bias, intent classification, Natural Language Processing, Artificial Intelligence, Classification models, Language processing, Model bias, Natural language processing applications, Natural languages, Natural language processing systems	Currently, Natural Language Processing (NLP) applications like chatbots are very close to mimic human responses. This has been achieved via powerful and sophisticated models like Bidirectional Encoder Representations from Transformers (BERT). Although, the capabilities that such models offer are superior to the technologies that preceded it, these models still possess bias. BERT or similar models are mostly trained on text corpora that deviate in important ways from the text encountered by a chatbot in a problem-specific context. Past research on NLP bias has heavily focused on measuring and mitigating bias with respect to protected attributes (stereotyping like gender, race, ethnicity, etc.), but the exploration of model bias with respect to classification labels remained yet to be explored. We investigate how a classification model hugely favors one class with respect to another. In this paper, we propose a bias evaluation technique called directional pairwise class confusion bias that highlights our chatbot intent classification models bias on pairs of classes. Lastly, we also demonstrate two bias mitigation strategies on a few example-biased pairs. © 2022 World Scientific Publishing Company.	10.1142/S1793351X22500040	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85136128406&doi=10.1142/S1793351X22500040&partnerId=40&md5=ac6338104e63a07655d96bc1317655
Y. Shan, Ji, M., Xie, W., Lam, K. Y., Chow, C. Y.	Public Trust in Artificial Intelligence Applications in Mental Health Care: Topic Modeling Analysis	JMIR Hum Factors	2022	9	4	e38799	AI application, Google Play, artificial intelligence, digital health, eHealth, health app: mHealth, mental disorder, mental health, mental health care, mental illness, mobile health, public opinion, public trust, term, theme, topic, topic modeling, user feedback, user review, visualization	BACKGROUND: Mental disorders (MDs) impose heavy burdens on health care (HC) systems and affect a growing number of people worldwide. The use of mobile health (mHealth) apps empowered by artificial intelligence (AI) is increasingly being resorted to as a possible solution. OBJECTIVE: This study adopted a topic modeling (TM) approach to investigate the public trust in AI apps in mental health care (MHC) by identifying the dominant topics and themes in user reviews of the 8 most relevant mental health (MH) apps with the largest numbers of reviewers. METHODS: We searched Google Play for the top MH apps with the largest numbers of reviewers, from which we selected the most relevant apps. Subsequently, we extracted data from user reviews posted from January 1, 2020, to April 2, 2022. After cleaning the extracted data using the Python text processing tool spaCy, we ascertained the optimal number of topics, drawing on the coherence scores and used latent Dirichlet allocation (LDA) TM to generate the most salient topics and related terms. We then classified the ascertained topics into different theme categories by plotting them onto a 2D plane via multidimensional scaling using the pyDAvis visualization tool. Finally, we analyzed these topics and themes qualitatively to better understand the status of public trust in AI apps in MHC. RESULTS: From the top 20 MH apps with the largest numbers of reviewers retrieved, we chose the 8 (40%) most relevant apps: (1) Wysa: Anxiety Therapy Chatbot; (2) Youper Therapy; (3) MindDoc: Your Companion; (4) Talklife for Anxiety, Depression & Stress; (5) 7 Cups: Online Therapy for Mental Health & Anxiety; (6) BetterHelp-Therapy; (7) Sanvello; and (8) InnerHour. These apps provided 14.2% (n=559), 11.0% (n=431), 13.7% (n=538), 8.8% (n=356), 14.1% (n=554), 11.9% (n=468), 9.2% (n=362), and 16.9% (n=663) of the collected 3931 reviews, respectively. The 4 dominant topics were topic 4 (cheering people up; n=1069, 27%), topic 3 (calming people down; n=1029, 26%), topic 2 (helping figure out the inner world; n=963, 25%), and topic 1 (being an alternative or complement to a therapist; n=870, 22%). Based on topic coherence and intertopic distance, topics 3 and 4 were combined into theme 3 (dispelling negative emotions), while topics 2 and 1 remained 2 separate themes: theme 2 (helping figure out the inner world) and theme 1 (being an alternative or complement to a therapist), respectively. These themes and topics, though involving some dissenting voices, reflected an overall high status of trust in AI apps. CONCLUSIONS: This is the first study to investigate the public trust in AI apps in MHC from the perspective of user reviews using the TM technique. The automatic text analysis and complementary manual interpretation of the collected data allowed us to discover the dominant topics hidden in a data set and categorize these topics into different themes to reveal an overall high degree of public trust. The dissenting voices from users, though only a few, can serve as indicators for health providers and app developers to jointly improve these apps, which will ultimately facilitate the treatment of prevalent MDs and alleviate the overburdened HC systems worldwide.	10.2196/38799	
V. Shestak, Gura, D., Khudyakova, N., Shaikh, Z. A., Bokov, Y.	Chatbot design issues: building intelligence with the Cartesian paradigm	Evolutionary Intelligence	2022	15	4	2351-2359	Artificial intelligence, Model of consciousness, Neural networks, Philosophy of consciousness, Botnet, Building intelligences, Chatbots, Design issues, Human like, Human users, Network architecture design, Neural network architecture, Neural-networks, Network architecture	The article discusses the functioning of human-like consciousness and the potential for developing a chatbot based on human-like consciousness. The proposed approach was verified experimentally using a sociological method and by attracting a cohort of student volunteers. The chatbot population was created on the back of our complex neural network architecture design. The volunteers were asked to identify their interlocutor, which was either a human agent or a chatbot. For integrity, the conversations between bots and people were organized randomly so that each volunteer could interact several times with all bots in the population and with all participants in the sample. The article discusses the results of the study, the details of the proposed approach. The article explains the features of the functioning and self-reconfiguration of the neural network that provide high reliability of chatbot replicas and high speed of responses to replicas of human users so that the delay time does not raise suspicion of human users. The main idea of the authors' approach is an attempt to model human self-awareness and self-reflection. The results prove the proposed neural network architecture design successful in terms of real-time self-learning. © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.	10.1007/s12065-020-00358-z	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85081574384&doi=10.1007/s12065-020-00358-z&partnerId=40&md5=077dbecbca0f01ce050b1f79914733c
D. Shin	The perception of humanness in conversational Journalism: An algorithmic information-processing perspective	New Media and Society	2022	24	12	2680-2704	algorithmic information processing, anthropomorphized chatbots, conversational journalism, explanatory cues, perceived humanness, social cues in AI, two-step flow	How much do anthropomorphisms influence the perception of users about whether they are conversing with a human or an algorithm in a chatbot environment? We develop a cognitive model using the constructs of anthropomorphism and explainability to explain user experiences with conversational journalism (CJ) in the context of chatbot news. We examine how users perceive anthropomorphic and explanatory cues, and how these stimuli influence user perception of and attitudes toward CJ. Anthropomorphic explanations of why and how certain items are recommended afford users a sense of humanness, which then affects trust and emotional assurance. Perceived humanness triggers a two-step process of interaction by defining the baseline to make a judgment about the qualities of CJ and by affording the capacity to interact with chatbots concerning their intention to interact with chatbots. We develop practical implications relevant to chatbots and ascertain the significance of humanness as a social cue in CJ. We offer a theoretical lens through which to characterize humanness as a key mechanism of human-artificial intelligence (AI) interaction, of which the eventual goal is humans perceive AI as human beings. Our results help to better understand human-chatbot interaction in CJ by illustrating how humans interact with chatbots and explaining why humans accept the way of CJ. © The Author(s) 2021.	10.1177/1464448221993801	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85102343789&doi=10.1177/1464448221993801&partnerId=40&md5=f6d6ca64e812e2a0cd64d833a3c06fb
M. Skjuve, Følstad, A., Følster-Vold, K. I., Brandtzaeg, P. B.	A longitudinal study of human-chatbot relationships	International Journal of Human-Computer Studies	2022	168			Human-chatbot relationships, Social chatbots, Social penetration theory, Chatbots, Formation process, Human-chatbot relationship, Longitudinal study, Penetration theory, Social chatbot, Substantial variations, Uncertainty	Social chatbots have become more advanced, paving the way for human-chatbot relationships (HCRs). Although this phenomenon has already received some research attention, the results have been contradictory, and there is uncertainty regarding how to understand HCR formation. To provide the needed knowledge on this phenomenon, we conducted a qualitative longitudinal study. We interviewed 25 participants over a 12-week period to understand how their HCRs formed with the popular chatbot Replika. We found that the HCRs formed gradually and mostly in line with the assumptions of Social Penetration Theory. Our findings indicate the need to acknowledge substantial variation and nuance in the HCR formation process, plus variation in the onset of self-disclosure and in the subsequent relationship formation. The results show that important drivers pushing the relationship toward attachment and perceived closeness appear to be Replika's ability to participate in a variety of interactions, as well as to support more deep-felt human needs related to social contact and self-reflection. In contrast, unpredictable events and technical difficulties could hinder relationship formation and lead to termination. Finally, we discuss the appropriateness of using a theoretical framework developed for human-human relationships when investigating HCRs, and we suggest directions for future research. © 2022 The Authors	10.1016/j.ijhcs.2022.102903	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85135909892&doi=10.1016/j.ijhcs.2022.102903&partnerId=40&md5=0c81631df677078d441d64e2b26d6330
C. Stokel-Walker	AI bot ChatGPT writes smart essays — should professors worry?	Nature	2022				Computer science, Education, Life, Society		10.1038/441586-022-04397-7	
C. Stokel-Walker	AI bot ChatGPT writes smart essays — should academics worry?	Nature	2022				computer, education, note		10.1038/441586-022-04397-7	https://www.embase.com/search/results?subaction=viewrecord&id=L2020529889&from=export , http://dx.doi.org/10.1038/441586-022-04397-7
A. Suárez-Adanero, A., Díaz-Flores García, V., Freire, Y., Algar, J.	Using a Virtual Patient via an Artificial Intelligence Chatbot to Develop Dental Students' Diagnostic Skills	International Journal of Environmental Research and Public Health	2022	19	14		chatbot, data analysis software, article, artificial intelligence, cross-sectional study, dental student, dentistry, female, human, male, questionnaire, skill, student satisfaction, virtual reality	Knowing how to diagnose effectively and efficiently is a fundamental skill that a good dental professional should acquire. If students perform a greater number of clinical cases, they will improve their performance with patients. In this sense, virtual patients with artificial intelligence offer a controlled, stimulating, and safe environment for students. To assess student satisfaction after interaction with an artificially intelligent chatbot that recreates a virtual patient, a descriptive cross-sectional study was carried out in which a virtual patient was created with artificial intelligence in the form of a chatbot and presented to fourth and fifth year dental students. After several weeks interacting with the AI, they were given a survey to find out their assessment. A total of 193 students participated. A large majority of the students were satisfied with the interaction (mean 4.36), the fifth year students rated the interaction better and showed higher satisfaction values. The students who reached a correct diagnosis rated this technology more positively. Our research suggests that the incorporation of this technology in dental curricula would be positively valued by students and would also ensure their training and adaptation to new technological developments.	10.3390/ijerph19148735	https://www.embase.com/search/results?subaction=viewrecord&id=L2018305343&from=export , http://dx.doi.org/10.3390/ijerph19148735
S. O. Thonmel, Klümpers, V., Nübling, M.	Strengthening the resilience of the blood supply chain by exploiting the advantages of digital information technology	Transfusion Medicine and Hemotherapy	2022	49	74		adult, blood transfusion, chatbot, circulation, conference abstract, content analysis, drought, human, human tissue, information technology, interview, manager, pandemic, physician, process model, simulation, validation process, vein	Background: The provision of safe and high-quality blood is a great challenge—particularly in times of crises. It is important that blood establishments can rely on adequate and timely information, as well as on emergency plans. The authors explore the potential of digital information technology for crisis intervention and management in blood establishments. We chose the South African blood transfusion system as a research object as it is well-developed and has IT-systems in place that we can build upon. Methods: First, we conducted interviews with experts from both the blood transfusion and crisis management systems to identify relevant stakeholders and the interfaces between the two systems. Second, we interviewed the responsible managers to map the diverse process steps from vein-to-vein. Third, we collected publicly available documents published by WHO, crisis management actors, and the blood establishments under investigation to triangulate data. We analyzed these data applying qualitative content analysis. Based on the inferred process model of the blood supply chain, we identified weak points, where the integration of information technology yields benefits. Finally, we did an onsite visit to validate the model and assumptions. Results: The interviewees perceive the South African blood transfusion system as fairly resilient. The analyzed blood establishment has good working relationships with the responsible crisis management actors. Yet, the crisis management system as a whole hardly includes the blood transfusion system in their crisis management planning activities. Still, there is a diverse impact of crisis scenarios (e.g., pandemic, droughts) on the blood supply chain. However, Chatbots and appointment systems for donor recruitment/management, simulation tools for storage and transportation decisions, real-time stock monitoring, and integration of the IT-systems of hospitals/crisis management actors with blood establishments are promising avenues for improvement. Conclusion: Information technology can contribute to further increase the resilience of African blood transfusion systems. Based on a successful example and inferred holistic emergency plans, this approach will be transferred to other African countries. Furthermore, the project insights and experiences enable researchers and practitioners in other continents to reflect critically upon the resilience of their national blood supply chain. (Figure Presented).	10.1159/000525886	https://www.embase.com/search/results?subaction=viewrecord&id=L44044136&from=export , http://dx.doi.org/10.1159/000525886

C. Taelos, Contreras, C., Istenes, B., Astupillo, A., Lecra, L., Ramos, K., Ramos, L., Roca, K., Galea, J. T., Towar, M., Mitnick, C. D., Peinado, J.	Using digital chatbots to close gaps in healthcare access during the COVID-19 pandemic	Public Health Action	2022	12	4 180-185	SARS-CoV-19, e-health, healthcare utilization, innovation, mental health	INTRODUCTION: Chatbots have emerged as a first link to care in recent years. The COVID-19 pandemic, and consequent health system disruptions, expanded their use. Socio En Salud (SES) introduced chatbots in Peru, which experienced one of the highest excess COVID mortalities in the world. METHODS: SES and the government identified unmet population health needs, which could be amenable to virtual interventions. Chatbots were developed to screen individuals for these conditions; we describe the period of deployment, number of screenings, and number of people who received services. RESULTS: Between April 2020 and May 2021, SES deployed nine Chatbots: four for mental health, two for maternal and child health, and three for chronic diseases: breast cancer, hypertension, diabetes mellitus, and obesity. Mental health services were provided to 42,932 people, 99.99% of those offered services. The other Chatbots reached fewer people. Overall, more than 50% of eligible people accepted chatbot-based services. DISCUSSION: Chatbot use was highest for mental health. Chatbots may increase connections between a vulnerable population and health services; this is likely dependent on several factors, including condition, population, and penetration of smart phones. Future research will be critical to understand user experience and preferences and to ensure that chatbots link vulnerable populations to appropriate, high-quality care.	10.5588/pha.22.0046	
M. J. P. van Bussel, Oudekerken-Schröder, G. J., Ou, C., Swart, R. R., Jacobs, M. J. G.	Analyzing the determinants to accept a virtual assistant and use cases among cancer patients: a mixed methods study	BMC Health Services Research	2022	22	1	Cancer, Chatbots, Conversational agents, Healthcare, Patients, Virtual assistants (VAs), artificial intelligence, behavior, human neoplasm, questionnaire, technology, theoretical model, Humans, Intention, Models, Theoretical, Neoplasms, Surveys and Questionnaires	Background: Technological progress in artificial intelligence has led to the increasing popularity of virtual assistants, i.e., embodied or disembodied conversational agents that allow chatting with a technical system in a natural language. However, only little comprehensive research is conducted about patients' perceptions and possible applications of virtual assistant in healthcare with cancer patients. This research aims to investigate the key acceptance factors and value-adding use cases of a virtual assistant for patients diagnosed with cancer. Methods: Qualitative interviews with eight former patients and four doctors of a Dutch radiotherapy institute were conducted to determine what acceptance factors they find most important for a virtual assistant and gain insights into value-adding applications. The unified theory of acceptance and use of technology (UTAUT) was used to structure perceptions and was inductively modified as a result of the interviews. The subsequent research model was triangulated via an online survey with 127 respondents diagnosed with cancer. A structural equation model was used to determine the relevance of acceptance factors. Through a multigroup analysis, differences between sample subgroups were compared. Results: The interviews found support for all factors of the UTAUT: performance expectancy, effort expectancy, social influence and facilitating conditions. Additionally, self-efficacy, trust, and resistance to change, were added as an extension of the UTAUT. Former patients found a virtual assistant helpful in receiving information about logistic questions, treatment procedures, side effects, or scheduling appointments. The quantitative study found that the constructs performance expectancy ($\beta = 0.399$), effort expectancy ($\beta = 0.258$), social influence ($\beta = 0.114$), and trust ($\beta = 0.210$) significantly influenced behavioral intention to use a virtual assistant, explaining 80% of its variance. Self-efficacy ($\beta = 0.792$) acts as antecedent of effort expectancy. Facilitating conditions and resistance to change were not found to have a significant relationship with user intention. Conclusions: Performance and effort expectancy are the leading determinants of virtual assistant acceptance. The latter is dependent on a patient's self-efficacy. Therefore, including patients during the development and introduction of a VA in cancer treatment is important. The high relevance of trust indicates the need for a reliable, secure service that should be promoted as such. Social influence suggests using doctors in endorsing the VA. © 2022, The Author(s).	10.1186/12913-022-08189-7	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85133727324&doi=10.1186%2F12913-022-08189-7&partnerID=40&md5=cf125087c4249094a7e2c5a25c9ef
E. S. B. Verdesoto, Ortiz, M. Y., R., Herrera, R. J. G.	A System for Converting and Recovering Texts Managed as Structured Information	Sci Rep	2022	12	1 22249	*Natural Language Processing, Language, Data Mining, Databases, Fact	This paper introduces a system that incorporates several strategies based on scientific models of how the brain records and recovers memories. Methodologically, an incremental prototyping approach has been applied to develop a satisfactory architecture that can be adapted to any language. A special case is studied and tested regarding the Spanish language. The applications of this proposal are vast because, in general, information such as text way, reports, emails, and web content, among others, is considered unstructured and, hence, the repositories based on SQL databases usually do not handle this kind of data correctly and efficiently. The conversion of unstructured textual information to structured one can be useful in contexts such as Natural Language Generation, Data Mining, and dynamic generation of theories, among others.	10.1038/s41598-022-26304-w	
P. Voegel, Alayouni, I. I. M., Ouda, A.	Smart Chatbot for User Authentication	Electronics (Switzerland)	2022	11	23	authentication, big data, chatbots, machine learning, natural language understanding	Despite being the most widely used authentication mechanism, password-based authentication is not very secure, being easily guessed or brute-forced. To address this, many systems which especially value security adopt Multi-Factor Authentication (MFA), in which multiple different authentication mechanisms are used concurrently. JIHDA (Just-in-time human dynamics based authentication engine) is a new authentication mechanism which can add another option to MFA capabilities. JIHDA observes human behaviour and human dynamics to gather up to date information on the user from which authentication questions can be dynamically generated. This paper proposes a system that implements JIHDA, which we call Autonomous Inquiry-based Authentication Chatbot (AIAC). AIAC uses anomalous events gathered from a user's recent activity to create personalized questions for the user to answer, and is designed to improve its own capabilities over time using neural networks trained on data gathered during authentication sessions. They will be easy for the authentic user to answer and hard for a fraudulent user to guess, and as the user's recent history updates between authentication sessions new questions will be dynamically generated to replace old ones. We intend to show in this paper that AIAC is a viable implementation of JIHDA. © 2022 by the authors.	10.3390/electronics11234016	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145587268&doi=10.3390/electronics11234016&partnerID=40&md5=cb622aa9e9aef30c6172bea581be75
U. Volpe	New way of Providing Care: the Role of Telemental Health	European Psychiatry	2022	65	543	adult, cell phone use, chatbot, conference abstract, coronavirus disease 2019, digital technology, education, health care practice, human, mental disease, mental health, mental health care, mental health service, mental patient, pandemic, prevention, psychiatry, social behavior, social media	Telemental health care can be defined as the delivery of mental health care services at distance, by using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of mental illnesses, as well as for research and education in the field of clinical psychiatry. While telemental health care practice was long established in many countries, its development proceeded with some variability worldwide. Over the past months, however, the recent COVID-19 pandemic has abruptly spread telemental health care practice worldwide, mostly to ensure the provision of care and assistance to psychiatric patients in spite of the governmental social contact restrictions. Although the process of rapid implementation has often happened at different rates and with different quality standards, across the various countries and sites, a global increase of the use of digital technologies has been reported. On the other hand, such recent events have also sparked a real paradigm shift in mental health care, significantly expanding the scope of e-mental health, given the recent availability of newer tools of digital psychiatry. In more detail, the use of mobile phones applications, of social media, of immersive reality and of chatbots is now driving psychiatry towards envisioning a more hybrid form of psychiatric practice, which holds the potential to finally overcome the traditional gap between the unmet needs of psychiatric patients and the relative lack of services and resources in mental health care. Here, the research evidence and the most compelling implementation issues in digital psychiatry will be reviewed.	10.1152/j.eurpsy.2022.147	https://www.embase.com/search/results?subaction=viewrecord&id=1639686858&from-report=http://dx.doi.org/10.1152/j.eurpsy.2022.147
S. Wang, Wei, J., Sabne, A., Davis, A., Ilibey, B., Hechtman, B., Chen, D., Murthy, K. S., Maggioni, M., Zhang, Q., Kumar, S., Guo, T., Xu, Y., Zhou, Z.	Overlap Communication with Deep Decomposition in Large Deep Learning Models		2022		93-106	Collective communication hiding, Compiler optimization, Large scale machine learning, Convolutional codes, Data transfer, Deep learning, Learning systems, Collective communications, Compiler optimizations, Data-communication, Fine grained, Intra-layer, Large models, Large-scale machine learning, Layer model, Learning models, Computational efficiency	Large deep learning models have shown great potential with state-of-the-art results in many tasks. However, running these large models is quite challenging on an accelerator (GPU or TPU) because the on-device memory is too limited for the size of these models. Intra-layer model parallelism is an approach to address the issues by partitioning individual layers or operators across distributed accelerators. But, the data communications between accelerators can contribute to a significant proportion of the overall execution time and severely hurt the computational efficiency. As intra-layer model parallelism is critical to enable large deep learning models, this paper proposes a novel technique to effectively reduce its data communication overheads by overlapping communication with computation. With the proposed technique, an identified original communication collective is decomposed along with the dependent computation operation into a sequence of finer-grained operations. By creating more overlapping opportunities and executing the newly created, finer-grained communication and computation operations in parallel, it effectively hides the data transfer latency and achieves a better system utilization. Evaluated on TPU v4 Pods using different types of large models that have 10 billion to 1 trillion parameters, the proposed technique improves system throughput by 1.14–1.38x. The achieved highest peak FLOPS utilization is 72% on 1024 TPU chips with a large language model that has 500 billion parameters. © 2022 Owner/Author.	10.1145/3567955.3567959	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145592482&doi=10.1145%2F3567955.3567959&partnerID=40&md5=0b3c355d673b1e7f067bd5f3ba268da3e
J. B. Whang, Song, J. H., Lee, J. H., Choi, B.	Interacting with Chatbots: Message type and consumers' control	Journal of Business Research	2022	153	309-318	Augmented reality, Behavioral control, Chatbots, Cognitive control, Personalization, Sales assistants	With advances in technology, personalized services provided by offline salespeople are replaced by new sales assistant methods, such as personalized chatbots in online and mobile environments. However, providing conversation-based recommendations may be insufficient to support consumers in online or mobile stores because they cannot experience the product in real-time. A salesperson often provides one-to-one customer support in an offline store, including verbal and visual recommendations. In this context, chatbots, the sales assistants, may better support consumers in the online and mobile environments by providing additional real-time visual information. This study aims to determine the condition of chatbots as online and mobile sales assistants, and the mechanisms by which consumers accept chatbots. The results indicate that a higher level of personalized chatbot messages enhances purchase intention through a sense of ease and understanding of the product. Moreover, additional real-time visual information (i.e., AR) supports chatbots in acting as successful sales assistants. © 2022 Elsevier Inc.	10.1016/j.jbusres.2022.08.012	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85138563781&doi=10.1016%2Fj.jbusres.2022.08.012&partnerID=40&md5=edda21e0248a5f3b93094d935ee0f319
B. K. White, Martin, A., White, J. A.	User Experience of COVID-19 Chatbots: Scoping Review	J Med Internet Res	2022	24	12 e35903	Humans, *COVID-19/epidemiology, Pandemics, Health Services, Covid-19, chatbot, digital health, engagement, global health, health information, pandemic, user experience	BACKGROUND: The COVID-19 pandemic has had global impacts and caused some health systems to experience substantial pressure. The need for accurate health information has been felt widely. Chatbots have great potential to reach people with authoritative information, and a number of chatbots have been quickly developed to disseminate information about COVID-19. However, little is known about user experiences of and perspectives on these tools. OBJECTIVE: This study aimed to describe what is known about the user experience and user uptake of COVID-19 chatbots. METHODS: A scoping review was carried out in June 2021 using keywords to cover the literature concerning chatbots, user engagement, and COVID-19. The search strategy included databases covering health, communication, marketing, and the COVID-19 pandemic specifically, including MEDLINE, Ovid, Embase, CINAHL, ACM Digital Library, Emerald, and EBSCO. Studies that assessed the design, marketing, and user features of COVID-19 chatbots or those that explored user perspectives and experience were included. We excluded papers that were not related to COVID-19; did not include any reporting on user perspectives, experience, or the general use of chatbot features or marketing; or where a version was not available in English. The authors independently screened results for inclusion, using both backward and forward citation checking of the included papers. A thematic analysis was carried out with the included papers. RESULTS: A total of 517 papers were sourced from the literature, and 10 were included in the final review. Our scoping review identified a number of factors impacting adoption and engagement including content, trust, digital ability, and acceptability. The papers included discussions about chatbots developed for COVID-19 screening and general COVID-19 information, as well as studies investigating user perceptions and opinions on COVID-19 chatbots. CONCLUSIONS: The COVID-19 pandemic presented a unique and specific challenge for digital health interventions. Design and implementation were required at a rapid speed as digital health service adoption accelerated globally. Chatbots for COVID-19 have been developed quickly as the pandemic has challenged health systems. There is a need for more comprehensive and routine reporting of factors impacting adoption and engagement. This paper has shown both the potential of chatbots to reach users in an emergency and the need to better understand how users engage and what they want.	10.2196/35903	
D. Wulff, Bertsch, V.	Corrigendum to: "A natural language generation approach to support understanding and traceability of multi-dimensional preferential sensitivity analysis in multi-criteria decision making" [Expert Syst. Appl. 83 (2017) 131–144 (S0957417417302907), (10.1016/j.eswa.2017.04.041)]	Expert Systems with Applications	2022	208			The authors regret that the private e-mail address of David Wulff is not used for scientific communication anymore. We kindly ask to remove the e-mail information of author David Wulff. The authors would like to apologise for any inconvenience caused. © 2022 Elsevier Ltd	10.1016/j.eswa.2022.118322	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85137791893&doi=10.1016%2Fj.eswa.2022.118322&partnerID=40&md5=9fba0a0542ef5241cf04df1412ad98

Y. Yamada, Tomoi, H., Nishina, Y., Harada, K., Tanaka, K., Sasaki, S., Inaba, K., Mitaka, H., Takahashi, H., Passanante, A., Lin, L., Lau, E., Wu, J., Nabo, T., Larson, H., Kobayashi, T.	Effect of a Mobile App Chatbot and an Interactive Small Group Webinar on COVID-19 Vaccine Intention and Confidence in Japan: A Randomized Clinical Trial	Open Forum Infectious Diseases	2022	9		5158-5159	SARS-CoV-2 vaccine, adult, chatbot, conference abstract, controlled study, demographics, drug safety, drug therapy, female, human, human experiment, Japan, Japanese (people), major clinical study, male, mobile application, randomized controlled trial, vaccine hesitancy, webinar	Background. Little is known about how social media platforms can be used to increase COVID-19 vaccine intent. We aimed to investigate the effect of social mediated interventions on vaccine hesitancy in Japan. Methods. We conducted a three-arm randomized controlled trial between 5 November 2021 and 9 January 2022. Japanese aged 20 or above who had not received any COVID-19 vaccine and did not intend to be vaccinated were randomly assigned to one of the following three groups: (i) a control group (with no intervention), (ii) a group with a free chatbot in a popular messenger app called LINE, which provided general information on COVID-19 vaccines and (iii) a group with free webinars where healthcare professionals interactively provided participants with the information on COVID-19 vaccines. The vaccine intention (VI) and three pre-defined Vaccine Confidence Index (VCI), including the importance, safety, and effectiveness of COVID-19 vaccines, were compared. Results. 1,158 persons were included, and the baseline characteristics and demographics were balanced across three groups (Table 1). Among 386 persons assigned to the chatbot group, 231 (59.8%) accessed the chatbot and answered the post-survey. The post-survey revealed no significant difference in VI or VCI between the chatbot group and the control group (Table 2). Among 386 persons assigned to the webinar group, 207 (53.6%) attended webinars and answered the post-survey. The post-survey revealed no difference in VI between the webinar group and the control group. However, the VCI for the importance and the effectiveness significantly increased in the webinar group. There was no difference in VCI for the safety. VCI for the importance and the effectiveness in the control group decreased without any intervention during the study period. Vaccine intention and confidence after interventions Conclusion. While this study demonstrated that neither the chatbot nor the webinar changed VI, VCI for the importance and the effectiveness significantly increased with the webinar intervention. Interactive webinars with live Q and A provided by professionals may have a role in increasing COVID-19 vaccine confidence. Given the degree of vaccine hesitancy worsened over time in the control group, timely intervention is required.	10.1093/ofid/ofac492.302	https://www.embase.com/search/results?subaction=viewrecord&id=L640022558&from-export=http://dx.doi.org/10.1093/ofid/ofac492.302
X. Yang, Chen, A., Pournejadian, N., Shin, H., C. Smith, K. E. Parisien, C. Compas, C. Martin, C. Costa, A. B. Flores, M. G. Zhang, Y., Magoc, T., Harle, C. A., Lpori, G., Mitchell, D. A., Hogan, W. R., Shenkman, E. A., Bian, J., Wu, Y. H.	A large language model for electronic health records	NPI Digit Med	2022	5	1	194		There is an increasing interest in developing artificial intelligence (AI) systems to process and interpret electronic health records (EHRs). Natural language processing (NLP) powered by pretrained language models is the key technology for medical AI systems utilizing clinical narratives. However, there are few clinical language models, the largest of which trained in the clinical domain is comparatively small at 110 million parameters (compared with billions of parameters in the general domain). It is not clear how large clinical language models with billions of parameters can help medical AI systems utilize unstructured EHRs. In this study, we develop from scratch a large clinical language model-GatorTron-using >90 billion words of text (including >82 billion words of de-identified clinical text) and systematically evaluate it on five clinical NLP tasks including clinical concept extraction, medical relation extraction, semantic textual similarity, natural language inference (NLI), and medical question answering (MQA). We examine how (1) scaling up the number of parameters and (2) scaling up the size of the training data could benefit these NLP tasks. GatorTron models scale up the clinical language model from 110 million to 8.9 billion parameters and improve five clinical NLP tasks (e.g., 9.6% and 9.5% improvement in accuracy for NLI and MQA), which can be applied to medical AI systems to improve healthcare delivery. The GatorTron models are publicly available at: https://catalog.ngc.nvidia.com/orgs/nvidia/teams/clara/models/gatortron_cg .	10.1038/s41746-022-00742-2	
X. Yang, Chen, A. K., Pournejadian, N., Shin, H., C. Smith, K. E. Parisien, C. Compas, C. Martin, C. Costa, A. B. Flores, M. G. Zhang, Y., Magoc, T., Harle, C. A., Lpori, G., Mitchell, D. A., Hogan, W. R., Shenkman, E. A., Bian, J., Wu, Y. H.	A large language model for electronic health records	NPI DIGITAL MEDICINE	2022	5	1			There is an increasing interest in developing artificial intelligence (AI) systems to process and interpret electronic health records (EHRs). Natural language processing (NLP) powered by pretrained language models is the key technology for medical AI systems utilizing clinical narratives. However, there are few clinical language models, the largest of which trained in the clinical domain is comparatively small at 110 million parameters (compared with billions of parameters in the general domain). It is not clear how large clinical language models with billions of parameters can help medical AI systems utilize unstructured EHRs. In this study, we develop from scratch a large clinical language model-GatorTron-using > 90 billion words of text (including > 82 billion words of de-identified clinical text) and systematically evaluate it on five clinical NLP tasks including clinical concept extraction, medical relation extraction, semantic textual similarity, natural language inference (NLI), and medical question answering (MQA). We examine how (1) scaling up the number of parameters and (2) scaling up the size of the training data could benefit these NLP tasks. GatorTron models scale up the clinical language model from 110 million to 8.9 billion parameters and improve five clinical NLP tasks (e.g., 9.6% and 9.5% improvement in accuracy for NLI and MQA), which can be applied to medical AI systems to improve healthcare delivery.	10.1038/s41746-022-00742-2	
S. Yu, Zhao, L.	Designing Emotions for Health Care Chatbots: Text-Based or Icon-Based Approach	J Med Internet Res	2022	24	12	e39573	Humans, Text Messaging, Emotions, Delivery of Health Care, behavioral intention, chatbot, design, emotion, emotional intensity, health care, human behavior, icon-based, perception, predict, psychological distance, text-based		10.2196/39573	
C. Zhai, Wibowo, S.	A systematic review on cross-culture, humor and empathy dimensions in conversational chatbots: the case of second language acquisition	Heliyon	2022	8	12	e12056	Artificial intelligence, Chatbot, Culture, Empathy, Humor, Second language learning, listed immediately below certify that he as NO affiliations with or involvement, in any organization or entity with any financial interest (such as honoraria, educational grants, participation in speakers' bureaus, membership, employment, consultancies, stock ownership, or other equity interest, and expert testimony or, patent-licensing arrangements), or non-financial interest (such as personal or, professional relationships, affiliations, knowledge or beliefs) in the subject, matter or materials discussed in this manuscript.	The advancement of information and communication technologies has led to an increasing use of conversational chatbots in the learning and teaching sector, especially for the second language (L2) acquisition. In the field of second language acquisition, the use of AI chatbots has been explored, mainly studying pedagogical approaches. However, there is a limited study in the development of empathetic strategies for dealing with learners' emotional discomfort, the impact of humor and the consideration of learners' cultural backgrounds. Thus, this study reviews the existing studies on AI second language (L2) chatbots to investigate the development of empathetic strategies for enhancing learners' learning outcomes. To achieve the aim of this study, prior studies from 2012 and 2022 of several popular databases, including Web of Science, ProQuest, IEEE and ScienceDirect are collected and analyzed. This study found that three dimensions such as cultural, empathetic and humorous dimensions have a positive influence on the application of AI L2 chatbots for enhancing learners' learning outcomes. This study also found that the development of an AI chatbot in L2 education has plenty of room for improvement. Several recommendations are made for enhancing the use of AI L2 chatbots which include integrating cross-cultural empathetic responses in conversational L2 chatbots, identifying how learners perceive and react to the learning content, and investigating the effects of cross-culture humor on learners' language proficiency.	10.1016/j.heliyon.2022.e12056	
C. P. Zhai, Wibowo, S.	A systematic review on cross-culture, humor and empathy dimensions in conversational chatbots: the case of second language acquisition	HELIVON	2022	8	12		Artificial intelligence, Chatbot, Second language learning, Culture, Empathy, Humor, ENGLISH, AGENT, WILLINGNESS, PERCEPTIONS, STUDENTS, CONTEXT, HEALTH	The advancement of information and communication technologies has led to an increasing use of conversational chatbots in the learning and teaching sector, especially for the second language (L2) acquisition. In the field of second language acquisition, the use of AI chatbots has been explored, mainly studying pedagogical approaches. However, there is a limited study in the development of empathetic strategies for dealing with learners' emotional discomfort, the impact of humor and the consideration of learners' cultural backgrounds. Thus, this study reviews the existing studies on AI second language (L2) chatbots to investigate the development of empathetic strategies for enhancing learners' learning outcomes. To achieve the aim of this study, prior studies from 2012 and 2022 of several popular databases, including Web of Science, ProQuest, IEEE and ScienceDirect are collected and analyzed. This study found that three dimensions such as cultural, empathetic and humorous dimensions have a positive influence on the application of AI L2 chatbots for enhancing learners' learning outcomes. This study also found that the development of an AI chatbot in L2 education has plenty of room for improvement. Several recommendations are made for enhancing the use of AI L2 chatbots which include integrating cross-cultural empathetic responses in conversational L2 chatbots, identifying how learners perceive and react to the learning content, and investigating the effects of cross-culture humor on learners' language proficiency.	10.1016/j.heliyon.2022.e12056	
T. Zhang, Feng, C., Chen, H., Xian, J.	Calm the customers by AI: Investigating the role of chatbot acting-cute strategies in soothing negative customer emotions	Electronic Markets	2022	32	4	2277-2292	Acting-cute strategies, Artificial intelligence, Chatbot, Negative customer emotion, Product or service failure	Although intelligent chatbot has been widely used in online customer service settings in modern E-business, scholars still have little understanding of the chatbot strategies implemented in product or service failure context. Aiming at this gap, this study explored whether, how, and when two chatbot acting-cute strategies (i.e., whimsical chatbot strategy and kindchenschema chatbot strategy) could soothe negative customer emotions when product or service failure happened. By using two experimental studies, the results demonstrated that both the whimsical chatbot strategy and the kindchenschema (baby schema) chatbot strategy could placate negative customer emotions via two mechanisms. In the high product or service failure severity context, the soothing effects of both strategies would weaken, while the kindchenschema chatbot strategy weakens less. The whimsical chatbot strategy is suitable for customers with high technology anxiety while the kindchenschema chatbot strategy is suitable for those who have low technology anxiety. The whimsical chatbot strategy was more effective with male customers than with female customers, while the kindchenschema chatbot strategy had the opposite effect. Finally, the theoretical and managerial implications were discussed. © 2022, The Author(s), under exclusive licence to Institute of Applied Informatics at University of Leipzig.	10.1007/s12525-022-00596-2	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143631469&doi=10.1007/s12525-022-00596-2&partnerID=40&md5=70ff3456b38f236e8b9c6f01e497ea
M. Y. Zhao, Huang, X. W., Sang, J. T., Yu, J.	Survey on Conversational Recommendation Algorithms	Ruan Jian Xue Bao/Journal of Software	2022	33	12	4616-4643	conversational recommendation system (CRS), human-computer interaction, recommendation system, user modeling, Behavioral research, Human computer interaction, Information filtering, Reinforcement learning, Speech processing, User profile, Conversational recommendation system, Conversational recommendations, Dialogue systems, Information filtering system, Offline models, Online users, Recommendation algorithms, User data, User Modelling, Recommender systems	Recommender system is an information filtering system that helps users filter a large number of invalid information to obtain information or items by estimating their interests and preferences. The mainstream traditional recommendation system mainly uses offline and historical user data to continuously train and optimize offline models, and then recommend items for online users. There are three main problems: the unreliable estimation of user preferences based on sparse and noisy historical data, the ignorance of online contextual factors that affect user behavior, and the unreliable assumption that users are aware of their preferences by default. Since the dialogue system focuses on the user's real-time feedback data and obtains the user's current interaction intentions, "conversational recommendation" combines the interactive form of the dialogue system with the recommendation task, and becomes an effective means to solve the traditional recommendation problem. Through online interactive methods, conversational recommendation can guide and capture users' current preferences and interests, and provide timely feedback and updates. Thanks to the widespread use of voice assistants and chatbot technologies, as well as the mature application of technologies such as reinforcement learning and knowledge graphs in recommendation strategies, in the past few years, more and more researchers have paid attention to conversational recommendation systems. This survey combs the overall framework of the conversational recommendation system, classifies the datasets used in the conversational recommendation algorithm, and discusses the relevant metrics to evaluate the effect of the conversational recommendation. Focusing on the background interaction strategy and recommendation logic in conversational recommendation, this survey summarizes the existing research achievements of the domestic and foreign researchers in recent years. And finally, this survey also summarizes and prospects future works of conversational recommendation. © 2022 Chinese Academy of Sciences. All rights reserved.	10.13328/j.cnki.jos.006521	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143631469&doi=10.13328/j.cnki.jos.006521&partnerID=40&md5=2316fb1a2eba3ef4956502dcb4f4d51

Zhavoronkov, A.	Rapamycin in the context of Pascal's Wager: generative pre-trained transformer perspective	Oncoscience	2022	9	82-84	Pascal's Wager, Rapamycin, artificial intelligence, longevity medicine, philosophy	Large language models utilizing transformer neural networks and other deep learning architectures demonstrated unprecedented results in many tasks previously accessible only to human intelligence. In this article, we collaborate with ChatGPT, an AI model developed by OpenAI to speculate on the applications of Rapamycin, in the context of Pascal's Wager philosophical argument commonly utilized to justify the belief in god. In response to the query "Write an exhaustive research perspective on why taking Rapamycin may be more beneficial than not taking Rapamycin from the perspective of Pascal's Wager" ChatGPT provided the pros and cons for the use of Rapamycin considering the preclinical evidence of potential life extension in animals. This article demonstrates the potential of ChatGPT to produce complex philosophical arguments and should not be used for any off-label use of Rapamycin.	10.18632/oncoscience.571		
X. Zhu, Li, R. Y. M., Crabbe, M. J. C., Sakaschareon, K.	Can a chatbot enhance hazard awareness in the construction industry?	Frontiers in public health	2022	10	993700	artificial intelligence, building industry, communicable disease control, human, prevention and control, software	Safety training enhances hazard awareness in the construction industry. Its effectiveness is a component of occupational safety and health. While face-to-face safety training has dominated in the past, the frequent lockdowns during COVID-19 have led us to rethink new solutions. A chatbot is messaging software that allows people to interact, obtain answers, and handle sales and inquiries through a computer algorithm. While chatbots have been used for language education, no study has investigated their usefulness for hazard awareness enhancement after chatbot training. In this regard, we developed four Telegram chatbots for construction safety training and designed the experiment as the treatment factor. Previous researchers utilized eye-tracking in the laboratory for construction safety research; most have adopted it for qualitative analyses such as heat maps or gaze plots to study visual paths or search strategies via eye-trackers, which only studied the impact of one factor. Our research has utilized an artificial intelligence-based eye-tracking tool. As hazard awareness can be affected by several factors, we filled this research void using 2-way interaction terms using the design of experiment (DOE) model. We designed an eye-tracking experiment to study the impact of site experience, Telegram chatbot safety training, and task complexity on hazard awareness, which is the first of its kind. The results showed that Telegram chatbot training enhanced the hazard awareness of participants with less onsite experience and in less complex scenarios. Low-cost chatbot safety training could improve site workers' danger awareness, but the design needs to be adjusted according to participants' experience. Our results offer insights to construction safety managers in safety knowledge sharing and safety training.	10.3389/fpubh.2022.993700	https://www.embase.com/search/results?subaction=viewrecord&id=L639812856&from=export , http://dx.doi.org/10.3389/fpubh.2022.993700	
M. Zvyagin, Brace, A., Hippe, K., Deng, Y., Zhang, B., Bohorquez, C. O., Clyde, A., Kale, B., Perez-Rivera, D., Ma, H., Mann, C. M., Irvin, M., Pauloski, J. G., Ward, L., Hayot-Sasson, V., Emani, M., Foreman, S., Xie, Z., Lin, D., Shukla, M., Nie, W., Romero, J., Dallago, C., Vahdat, A., Xiao, C., Gibbs, T., Foster, L.	GenSLMs: Genome-scale language models reveal SARS-CoV-2 evolutionary dynamics		2022			Zvyagin M.; Brace A.; Hippe K.; Deng Y.; Zhang B.; Bohorquez C. O.; Clyde A.; Perez-Rivera D.; Ma H.; Mann C. M.; Irvin M.; Pauloski J. G.; Ward L.; Hayot-Sasson V.; Emani M.; Foreman S.; Xie Z.; Lin D.; Shukla M.; Nie W.; Romero J.; Dallago C.; Vahdat A.; Xiao C.; Gibbs T.; Foster L.	We seek to transform how new and emergent variants of pandemic-causing viruses, specifically SARS-CoV-2, are identified and classified. By adapting large language models (LLMs) for genomic data, we build genome-scale language models (GenSLMs) which can learn the evolutionary landscape of SARS-CoV-2 genomes. By pre-training on over 110 million prokaryotic gene sequences and fine-tuning a SARS-CoV-2-specific model on 1.5 million genomes, we show that GenSLMs can accurately and rapidly identify variants of concern. Thus, to our knowledge, GenSLMs represents one of the first whole genome scale foundation models which can generalize to other prediction tasks. We demonstrate scaling of GenSLMs on GPU-based supercomputers and AI-hardware accelerators utilizing 1.63 Zettaflops in training runs with a sustained performance of 121 PFLOPS in mixed precision and peak of 850 PFLOPS. We present initial scientific insights from examining GenSLMs in tracking evolutionary dynamics of SARS-CoV-2, paving the path to realizing this on large biological data.	10.1101/2022.10.10.511571	https://www.embase.com/search/results?subaction=viewrecord&id=L2021262897&from=export , http://dx.doi.org/10.1101/2022.10.10.511571	
	Tools such as ChatGPT threaten transparent science; here are our ground rules for their use	Nature	2023	613	7945	612	"Artificial Intelligence/ethics/legislation & jurisprudence/trends, Ethics, Research, "Publishing/ethics/legislation & jurisprudence/standards, "Science/ethics/methods/standards, "Writing/standards, Authorship/standards, Ethics, Machine learning, Publishing, Scientific community		10.1038/d41586-023-00191-1	
	Welcome to the AI future?	NATURE ASTRONOMY	2023	7	1	01-Jan		The launch of ChatGPT late last year has school teachers, conference organizers, Google and others worried, for different reasons. Where should we draw the line when it comes to artificial intelligence?	10.1038/d41550-023-01891-4	
F. Agbavor, Llang, H. L.	Artificial Intelligence-Enabled End-To-Def Detection and Assessment of Alzheimer's Disease Using Voice	Brain Sciences	2023	13	1		adult, Alzheimer disease, area under the curve, article, artificial intelligence, artificial neural network, computer model, controlled study, decision tree, dementia, diagnostic test accuracy study, DNA extraction, female, heart rate variability, human, learning algorithm, machine learning, major clinical study, male, Mini Mental State Examination, Montreal cognitive assessment, predictive value, propensity score, quality of life, quantitative structure activity relation, receiver operating characteristic, risk assessment, scoring system, support vector machine, time series analysis, voice	There is currently no simple, widely available screening method for Alzheimer's disease (AD), partly because the diagnosis of AD is complex and typically involves expensive and sometimes invasive tests not commonly available outside highly specialized clinical settings. Here, we developed an artificial intelligence (AI)-powered end-to-end system to detect AD and predict its severity directly from voice recordings. At the core of our system is the pre-trained data2vec model, the first high-performance self-supervised algorithm that works for speech, vision, and text. Our model was internally evaluated on the ADReSo (Alzheimer's Dementia Recognition through Spontaneous Speech only) dataset containing voice recordings of subjects describing the Cookie Theft picture, and externally validated on a test dataset from DementiaBank. The AI model can detect AD with average area under the curve (AUC) of 0.846 and 0.835 on held-out and external test set, respectively. The model was well-calibrated (Hosmer-Lemeshow goodness-of-fit p-value = 0.9616). Moreover, the model can reliably predict the subject's cognitive testing score solely based on raw voice recordings. Our study demonstrates the feasibility of using the AI-powered end-to-end model for early AD diagnosis and severity prediction directly based on voice, showing its potential for screening Alzheimer's disease in a community setting.	10.3390/brainsci13010028	https://www.embase.com/search/results?subaction=viewrecord&id=L2021160884&from=export , http://dx.doi.org/10.3390/brainsci13010028
F. Agbavor, Yu, Q. C., Patel, P.	Artificial Intelligence-Enabled End-To-Def Detection and Assessment of Alzheimer's Disease Using Voice	BRAIN SCIENCES	2023	13	1		Alzheimer's disease, dementia, end-to-end, data2vec, large language models, speech and language	There is currently no simple, widely available screening method for Alzheimer's disease (AD), partly because the diagnosis of AD is complex and typically involves expensive and sometimes invasive tests not commonly available outside highly specialized clinical settings. Here, we developed an artificial intelligence (AI)-powered end-to-end system to detect AD and predict its severity directly from voice recordings. At the core of our system is the pre-trained data2vec model, the first high-performance self-supervised algorithm that works for speech, vision, and text. Our model was internally evaluated on the ADReSo (Alzheimer's Dementia Recognition through Spontaneous Speech only) dataset containing voice recordings of subjects describing the Cookie Theft picture, and externally validated on a test dataset from DementiaBank. The AI model can detect AD with average area under the curve (AUC) of 0.846 and 0.835 on held-out and external test set, respectively. The model was well-calibrated (Hosmer-Lemeshow goodness-of-fit p-value = 0.9616). Moreover, the model can reliably predict the subject's cognitive testing score solely based on raw voice recordings. Our study demonstrates the feasibility of using the AI-powered end-to-end model for early AD diagnosis and severity prediction directly based on voice, showing its potential for screening Alzheimer's disease in a community setting.	10.3390/brainsci13010028	
A. Ahmed, Hasan, A., Aziz, S., Abd-Alrazaq, A. A., Ali, N., Alzubaidi, M., Al-Thanji, D., Elhusein, B., Siddiq, M. A., Ahmed, M., Husein, M.	Chatbot features for anxiety and depression: A scoping review	Health Informatics J	2023	29	1	1.5E+16	Humans, "Depression/therapy, Anxiety/therapy, "Mental Disorders, Mental Health, Software, Anxiety, chatbots, conversational agents, depression	Chatbots can provide valuable support to patients in assessing and guiding management of various health problems particularly when human resources are scarce. Chatbots can be affordable and efficient on-demand virtual assistants for mental health conditions, including anxiety and depression. We review features of chatbots available for anxiety or depression. Six bibliographic databases were searched including backward and forwards reference list checking. The initial search returned 1302 citations. Post-filtering, 42 studies remained forming the final dataset for this scoping review. Most of the studies were from conference proceedings (62%, 26/42), followed by journal articles (26%, 11/42), reports (7%, 3/42), or book chapters (5%, 2/42). About half of the reviewed chatbots had functionality targeting both anxiety and depression (50%, 25/42), whereas 38% (16/42) targeted only depression, 38% (16/42) anxiety and the remaining addressed other mental health issues along with anxiety and depression. Avatars or fictional characters were rarely used in these studies only 26% (11/42) despite their increasing popularity. Mental health chatbots could benefit in helping patients with anxiety and depression and provide valuable support to mental healthcare workers, particularly when resources are scarce. Real-time personal virtual assistance fills in this gap. Their role in mental health care is expected to increase.	10.1177/14604582221146719	
C. Ahn	Exploring ChatGPT for information of cardiopulmonary resuscitation	Resuscitation	2023	185		109729			10.1016/j.resuscitation.2023.109729	
A. Almada, Yu, Q. C., Patel, P.	Proactive Chatbot Framework Based on the PS2CLM Model: An AI-Deep Learning Chatbot Assistant for Students	INTELLIGENT SYSTEMS AND APPLICATIONS, VOL. 1	2023	542	751-770	AI-Deep Learning chatbot, Framework, Students' assistant	Nowadays, universities are using more technologies dealing with students' interactions. The chatbot supported with Artificial Intelligence (AI) - Deep Learning (DL) technology exhibited a better ability and efficiency in various assistant situations. However, the effectiveness of the education chatbot is still not satisfactory. This paper proposes a new chatbot framework that integrated students' learning profiles and enhanced chatbot components to improve student interaction. The new chatbot framework uses knowledge from the PS2CLM model and AI-DL to build a proactive chatbot for assisting students' learning on their academic subjects and controllable learning factors. One of the principal novelties of the chatbot framework lies in the student-lecturer/assistant facilitator. The proactive chatbot applies multimodality to students' learning process to retain students' attention and explain the content in different ways using text, image, video, and audio to assist students and improve their learning experience effectively. Furthermore, the chatbot proactively suggests controllable learning factors for students to work on, improving their academic performance. The testing results demonstrated that the proactive chatbot offered sound accuracy and more effective learning support than other chatbots.	10.1007/978-3-031-16072-1_54		

S. Anand, Raj, D., Sai, A. M. A., Rao, S. N., Vinodini Ramech, M.	Techno-Social Synergy for Disaster Resilience in Coastal Communities : A Sustainable Approach		2023		366-371	AI chatbot, Coastal community participation, Disaster risk reduction, Emergency response, Neural networks, Climate change, Emergency services, Flood, Losses, Storms, Chatbots, Coastal communities, Community participation, Disaster resilience, Disaster risk reductions, Neural-networks, Techno socials, Sea level	Disasters are inevitable for the coastal community due to their geographical closeness to the vast ocean. Sea-level rise, coastal floods, cyclones, hurricanes, tsunamis, and even high tides affect coastal communities across the globe. It leads to substantial economic loss and loss of human lives and properties, affecting the coastal communities' livelihood and sustainability. Often the warning time and the preparation time to take action are relatively short. The community needs to be prepared to move to a safer location in this short duration. This work addresses the disaster risk reduction methods that need to be adopted by the coastal communities in India to reduce the impact of natural disasters and climate change risks they are susceptible. We propose an AI-based chatbot to provide accurate and up-to-date information about the spatiotemporally varying disaster scenarios and the vulnerability and resilience indexes. The AI-based chatbot will enhance the user experience and user safety by providing accurate information about disaster alerts through their smartphones. © 2023 ACM.	10.1145/3571306.3571437	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145873499&doi=10.1145%2F3571306.3571437&partnerId=40&m5=d025bc2194040871125f721b318a13fb
G. Annella, Sanabria, M., Primé-Tous, M., Segú, X., Caveno, M., Morilla, I., Ruiz, V., Grande, L., Mas, A., Martín-Villalba, I., Caballo, A., Esteve, J. P., Rodríguez-Rey, A., Piazza, F., Valdesoro, F. J., Rodríguez-Torrella, C., Espinosa, M., Sorroche, C., Virgili, G., Ruiz, A., Solanes, A., Radua, J., Alo, M. A., Sant, E.	Vickybot, a chatbot for anxiety-depressive symptoms and work-related burnout in primary care and healthcare professionals: development, feasibility, and potential effectiveness study	J Med Internet Res	2023				BACKGROUND: A significant proportion of people attending Primary Care (PC) have anxiety-depressive symptoms and work-related burnout compounded by a lack of resources to meet their needs. The COVID-19 pandemic has exacerbated this problem and digital tools have been proposed as a solution. OBJECTIVE: We present the development, feasibility, and potential effectiveness studies of Vickybot, a chatbot aimed at screening, monitoring, and reducing anxiety-depressive symptoms and work-related burnout in PC patients and healthcare workers. METHODS: User-centered development strategies were adopted. Main functions included self-assessments, psychological modules, and emergency alerts. Healthy controls (HCs) tested Vickybot for reliability. (1) Simulation: HCs used Vickybot for 2 weeks to simulate different clinical situations. (2) Feasibility and effectiveness study: People consulting PC or healthcare workers with mental health problems were offered to use Vickybot for one month. Self-assessments for anxiety (GAD-7) and depression (PHQ-9) symptoms, and work-related burnout (based on the Maslach Burnout Inventory) were administered at baseline and every two weeks. Feasibility was determined from both subjective and objective user-engagement Indicators (UEIs). Potential effectiveness was measured using paired t-tests or the Wilcoxon signed-rank test for the change in self-assessment scores. RESULTS: 40 HCs tested Vickybot simultaneously, and data was transmitted and registered reliably. (1) Simulation: 17 HCs (73% female; mean age=36.5±5.7) received 98.8% of the expected modules according to each simulation. Suicidal alerts were correctly received. (2) Feasibility and potential effectiveness study: 34 patients (15 from PC and 19 healthcare workers; 77% female; mean age=35.3±10.1) completed the first self-assessments, with 34 (100%) presenting anxiety symptoms, 32 (94%) depressive symptoms, and 22 (64.7%) work-related burnout. Nine (26.5%) patients completed the second self-assessments after two weeks of use. No significant differences were found between the scores of the first and second self-assessments for anxiety [t(8) = 1.000, P = .34] or depressive [t(8) = .40, P = .70] symptoms. However, work-related burnout scores were moderately reduced (Z = -2.07, P = 0.038, r = .32). There was a non-significant trend towards higher reduction in anxiety-depressive symptoms and work-related burnout with greater use of the chatbot. Three patients (8.8%) activated the suicide alert, and the research team intervened promptly with successful outcomes. Vickybot showed high subjective-UEIs, but low objective-UEIs (completion, adherence, compliance, and engagement). Feasibility was moderate. CONCLUSIONS: The chatbot was useful in screening for the presence and severity of anxiety and depressive symptoms, and detecting suicidal risk. Potential effectiveness was shown in reducing work-related burnout, but not anxiety or depressive symptoms. Subjective perceptions of use contrasted with low objective-use metrics. Our results are promising but suggest the need to adapt and enhance the smartphone-based solution in order to improve engagement. Consensus on how to report UEIs and validate digital solutions, especially for chatbots, are required.	10.2196/43293	
F. Antaki, Touma, S., Milad, D., El-Khoury, J., Duval, R.	Evaluating the Performance of ChatGPT in Ophthalmology: An Analysis of Its Successes and Shortcomings		2023		Antaki F.; Touma S.; Milad D.; El-Khoury J.; Duval R.; renaud.duval@gmail.com; Department of Ophthalmology, Université de Montréal, Montréal, QC, Canada	artificial intelligence, clinical decision making, general practice, human, intraocular tumor, language, medical education, multiple choice test, neuroophthalmology, recall, simulation	We tested the accuracy of ChatGPT, a large language model (LLM), in the ophthalmology question-answering space using two popular multiple choice question banks used for the high-stakes Ophthalmic Knowledge Assessment Program (OKAP) exam. The testing sets were of easy-to-moderate difficulty and were diversified, including recall, interpretation, practical and clinical decision-making problems. ChatGPT achieved 55.8% and 42.7% accuracy in the two 260-question simulated exams. Its performance varied across subspecialties, with the best results in general medicine and the worst in neuro-ophthalmology and ophthalmic pathology and intraocular tumors. These results are encouraging but suggest that specialising LLMs through domain-specific pretraining may be necessary to improve their performance in ophthalmic subspecialties.	10.1101/2023.01.22.23284882	https://www.embase.com/search/results?subaction=viewrecord&id=t2022548395&from=export,http://dx.doi.org/10.1101/2023.01.22.23284882
R. M. Baghmolaei, Ahmadi, A.	TET: Text emotion transfer	KNOWLEDGE-BASED SYSTEMS	2023	262		Natural language generation, Text style transfer, Emotion recognition, Transfer learning, Masked language modeling, Transformers, AWARE INFLUENCE MAXIMIZATION, SENTIMENT, IDENTIFICATION, OPINION, MODEL	Text style transfer aims at transforming the style of a piece of text while keeping its primary content. The style of the text is usually defined as a particular writing tone in different categories, such as formality, politeness, sentiment, and political slant. Recently, most of the work in the area has been devoted to the problem of sentiment transfer, which tries to transfer an opinionated text into a positive or negative perspective. It has applications in marketing, political news, chatbots, writing tools, and many others. On the other hand, emotions as the basic forms of sentiments have brought many attempts to different tasks, including image style transfer but they are not well expressed in text style transfer yet. This article presents a text emotion transfer model that transforms the style of a text to each of the predefined 'anger', 'fear', 'joy', and 'sadness' emotions. Relying on masked language modeling and transfer learning, the proposed model can perform efficiently on limited amounts of emotion-annotated data. Moreover, the model shows promising experimental results against other existing models considering style transfer accuracy, content preservation, and fluency in the ISEAR and TEC emotion corpora.(c) 2022 Elsevier B.V. All rights reserved.	10.1016/j.knys.2022.110236	
Z. A. Baizal, Ikhan, N., Karo, I. M. K., Darmawan, R. K., Hartanto, R. D.	Movie recommender chatbot based on Dialogflow	International Journal of Electrical and Computer Engineering	2023	13	1 936-947	Chatbot, Conversational recommender system, Dialogflow, Movie recommendation, Recommender system	Currently, the online movie streaming business is growing rapidly, such as Netflix, Disney, Amazon Prime Video, HBO, and Apple TV. The recommender system helps customers in getting information about movies that are in accordance with their wishes. Meanwhile, the development of messaging platform technology has made it easier for many people to communicate instantly. Utilizing a messaging platform to build a recommender system for movies, provides special benefits because people often access the messaging platform all the time. In the Indonesian language, there are many slang terms that the system must recognize. In this study, we build a chatbot in a messaging platform which users can interact with the system in natural language (in Indonesian language) and get recommendations. We use rule-based and maximum likelihood as a method in natural language processing (NLP), and content-based filtering for the recommendation process. The recommender system interaction is built through a conversation mechanism that will form a conversational recommender system. The interaction is based on a chatbot which is built using Dialogflow and implemented on the telegram. We use the accuracy of recommendations and user satisfaction to evaluate the system performance. The results obtained from the user study indicate that the NLP approach provides a positive experience for users. In addition, the system also produces an accuracy value of 83%. © 2023 Institute of Advanced Engineering and Science. All rights reserved.	10.11591/ijecs.v13i1.pp936-947	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8513878221&doi=10.11591%2Fijecs.v13i1.pp936-947&partnerId=40&m5=8074a4779faea88a7b97a85309c5c5c
H. Barbe, Müller, J. L., Siegel, B., Fromberger, P.	An Open Source Virtual Reality Training Framework for the Criminal Justice System	Criminal Justice and Behavior	2023	50	2 294-303	chatbot, criminal justice system, forensic conversation training, forensic psychiatry, open source, virtual reality training, virtual standardized patient	We developed an open-source training framework to practice conversation skills in a controlled and immersive virtual reality (VR) environment. Virtual characters with different biographies were developed with which a conversation using natural language is possible. The virtual characters integrate a dialog management system (ChatScript) to provide different biographical memories. Natural language processing for the German language is integrated by using Kaldi, an open-source speech recognition toolkit. As the framework allows for interchangeable content there are many different possible application cases to apply within the criminal justice system. The VR framework code is available under an open-source license. In this article, an overview of the framework's functionality is given as well as an outlook on possible areas of application. Statements about user acceptance and usability cannot yet be made, as relevant data have first to be gathered through a concrete application case. © 2022 International Association for Correctional and Forensic Psychology.	10.1177/00938548221124128	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8513873557&doi=10.1177%2F00938548221124128&partnerId=40&m5=d463bf3e1e17a85140af303dc22de
V. S. Barletta, Cavano, D., Colizzi, L., Dimairo, G., Plattini, G.	Clinical-chatbot AHP evaluation based on "quality in use" of ISO/IEC 25010	Int J Med Inform	2023	170	104951	Humans, "Software, "Health Facilities, Communication, Technology, Ahp, Clinical pathway, Iso/Iec 25010, Medical-chatbot quality, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	BACKGROUND: Conversational agents are currently a valid alternative to humans in first-level interviews with users who need information, even in-depth, about services or products. In application domains such as health care, this technology can become pervasive only if the perceived "quality in use" is appropriate. How to measure chatbot quality is an open question. The international standard ISO/IEC 25010 proposes a set of characteristics (effectiveness, efficiency, satisfaction, freedom from risk, and context coverage) to be considered when the "quality in use" of a software system has to be measured. BASIC PROCEDURE: This study proposes a clinical chatbot comparison method based on quality. The proposed approach is based on Analytic Hierarchy Process methodology (AHP). FINDINGS: Our contribution is twofold. First, we propose a set of measures for each characteristic of ISO/IEC 25010 according to three classes of functionality: providing information, providing prescriptions and process management. Moreover a quantitative method is proposed for making homogeneous the pairwise weights when the AHP is used for the "quality-in-use" comparison. As a case study, a comparison of two versions of a chatbot was performed. CONCLUSIONS: The results show that the proposed approach provides an effective reference base for performing quality comparisons of medical chatbots compliant with the ISO/IEC 25010 standard.	10.1016/j.jmedinf.2022.104951	
G. Bercanu, Truică, C. O., Chiru, C. G., Rebedea, T.	Improving Intent Classification Using Unlabeled Data from Large Corpora	Mathematics	2023	11	3	chatbot, data augmentation, data projection, few-shot learning, intent classification, online clustering	Intent classification is a central component of a Natural Language Understanding (NLU) pipeline for conversational agents. The quality of such a component depends on the quality of the training data. However, for many conversational scenarios, the data might be scarce; in these scenarios, data augmentation techniques are used. Having general data augmentation methods that can generalize to many datasets is highly desirable. The work presented in this paper is centered around two main components. First, we explore the influence of various feature vectors on the task of intent classification using RASA's text classification capabilities. The second part of this work consists of a generic method for efficiently augmenting textual corpora using large datasets of unlabeled data. The proposed method is able to efficiently mine for examples similar to the ones that are already present in standard, natural language corpora. The experimental results show that using our corpus augmentation methods enables an increase in text classification accuracy in few-shot settings. Particularly, the gains in accuracy raise up to 16% when the number of labeled examples is very low (e.g., two examples). We believe that our method is important for any Natural Language Processing (NLP) or NLU task in which labeled training data are scarce or expensive to obtain. Lastly, we give some insights into future work, which aims at combining our proposed method with a semi-supervised learning approach. © 2023 by the authors.	10.3390/math11030769	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147858541&doi=10.3390%2Fmath11030769&partnerId=40&m5=3789f356a823ff797828cd13bd9b6a
M. Binz, Schulz, E.	Using cognitive psychology to understand GPT-3	Proc Natl Acad Sci U S A	2023	120	6 e2218523120	Humans, "Decision Making, "Cognitive Psychology, Problem Solving, Learning, Reinforcement, Psychology, artificial intelligence, cognitive psychology, decision making, language models, reasoning	We study GPT-3, a recent large language model, using tools from cognitive psychology. More specifically, we assess GPT-3's decision-making, information search, deliberation, and causal reasoning abilities on a battery of canonical experiments from the literature. We find that much of GPT-3's behavior is impressive: it solves vignette-based tasks similarly or better than human subjects, is able to detect decision biases from descriptions, outperforms humans in a multimodal bandit task, and shows signatures of model-based reinforcement learning. Yet, we also find that small perturbations to vignette-based tasks can lead GPT-3 vastly astray, that it shows no signatures of directed exploration, and that it fails miserably in a causal reasoning task. Taken together, these results enrich our understanding of current large language models and pave the way for future investigations using tools from cognitive psychology to study increasingly capable and opaque artificial agents.	10.1073/pnas.2218523120	

J. Biro, Linder, C. Neyens, D.	The Effects of a Health Care Chatbot's Complexity and Persona on User Trust, Perceived Usability, and Effectiveness: Mixed Methods Study	JMIR Hum Factors	2023	10	e41017	Div. adoption, artificial intelligence, chatbot, effectiveness, electronic health record, health information, patient education, trust, usability, virtual agent, virtual assistant	BACKGROUND: The rising adoption of telehealth provides new opportunities for more effective and equitable health care information mediums. The ability of chatbots to provide a conversational, personal, and comprehensible avenue for learning about health care information make them a promising tool for addressing health care inequity as health care trends continue toward web-based and remote processes. Although chatbots have been studied in the health care domain for their efficacy for smoking cessation, diet recommendation, and other assistive applications, few studies have examined how specific design characteristics influence the effectiveness of chatbots in providing health information. OBJECTIVE: Our objective was to investigate the influence of different design considerations on the effectiveness of an educational health care chatbot. METHODS: A 2x3 between-subjects study was performed with 2 independent variables: a chatbot's complexity of responses (eg, technical or nontechnical language) and the presented qualifications of the chatbot's persona (eg, doctor, nurse, or nursing student). Regression models were used to evaluate the impact of these variables on 3 outcome measures: effectiveness, usability, and trust. A qualitative transcript review was also done to review how participants engaged with the chatbot. RESULTS: Analysis of 71 participants found that participants who received technical language responses were significantly more likely to be in the high effectiveness group, which had higher improvements in test scores [odds ratio (OR) 2.73, 95% CI 1.05-7.41; P=.04]. Participants with higher health literacy (OR 2.04, 95% CI 1.1-4.00; P=.03) were significantly more likely to trust the chatbot. The participants engaged with the chatbot in a variety of ways, with some taking a conversational approach and others treating the chatbot more like a search engine. CONCLUSIONS: Given their increasing popularity, it is vital that we consider how chatbots are designed and implemented. This study showed that factors such as chatbots' persona and language complexity are two design considerations that influence the ability of chatbots to successfully provide health care information.	10.2196/41017	
S. Biswas	ChatGPT and the Future of Medical Writing	Radiology	2023		223312			10.1148/radiol.223312	
P. Cahan, Treutlein, B.	A conversation with ChatGPT on the role of computational systems biology in stem cell research	Stem Cell Reports	2023	18	1	01.Feb	"Systems Biology," "Stem Cell Research," "Computational Biology," "Communication	10.1016/j.stemcr.2022.12.009	
R. A. Calvo, Peters, D., Moradlouhi, J., Cook, D., Rizzo, G., Schuller, B., Kallis, C., Wong, E., Quint, J.	Assessing the Feasibility of a Text-Based Conversational Agent for Asthma Support: Protocol for a Mixed Methods Observational Study	JMIR Res Protoc	2023	12	e42965	artificial intelligence, asthma, behavior change, chatbot, conversational agent, health, health education, well-being, received conference sponsorship from Chiesi Limited and has a joint working, agreement for a project between Imperial College Healthcare NHS Trust and, AstraZeneca UK. IQ has received grants from MRC, Health Data Research UK, GSK, Bayer, Boehringer Ingelheim, AstraZeneca, Chiesi, Teva, Insmad, and Bayer.	BACKGROUND: Despite efforts, the UK death rate from asthma is the highest in Europe, and 65% of people with asthma in the United Kingdom do not receive the professional care they are entitled to. Experts have recommended the use of digital innovations to help address the issues of poor outcomes and lack of care access. An automated SMS text messaging-based conversational agent (ie, chatbot) created to provide access to asthma support in a familiar format via a mobile phone has the potential to help people with asthma across demographics and at scale. Such a chatbot could help improve the accuracy of self-assessed risk, improve asthma self-management, increase access to professional care, and ultimately reduce asthma attacks and emergencies. OBJECTIVE: The aims of this study are to determine the feasibility and usability of a text-based conversational agent that processes a patient's text responses and short sample voice recordings to calculate an estimate of their risk for an asthma exacerbation and then offers follow-up information for lowering risk and improving asthma control; assess the levels of engagement for different groups of users, particularly those who do not access professional services and those with poor asthma control; and assess the extent to which users of the chatbot perceive it as helpful for improving their understanding and self-management of their condition. METHODS: We will recruit 300 adults through four channels for broad reach: Facebook, YouTube, Asthma + Lung UK social media, and the website Healthily (a health self-management app). Participants will be screened, and those who meet inclusion criteria (adults diagnosed with asthma and who use WhatsApp) will be provided with a link to access the conversational agent through WhatsApp on their mobile phones. Participants will be sent scheduled and randomly timed messages to invite them to engage in dialogue about their asthma risk during the period of study. After a data collection period (28 days), participants will respond to questionnaire items related to the quality of the interaction. A pre- and postquestionnaire will measure asthma control before and after the intervention. RESULTS: This study was funded in March 2021 and started in January 2022. We developed a prototype conversational agent, which was iteratively improved with feedback from people with asthma, asthma nurses, and specialist doctors. Fortnightly reviews of iterations by the clinical team began in September 2022 and are ongoing. This feasibility study will start recruitment in January 2023. The anticipated completion of the study is July 2023. A future randomized controlled trial will depend on the outcomes of this study and funding. CONCLUSIONS: This feasibility study will inform a follow-up pilot and larger randomized controlled trial to assess the impact of a conversational agent on asthma outcomes, self-management, behavior change, and access to care. INTERNATIONAL REGISTERED REPORT IDENTIFIER (RRID): PRR1-10.2196/42965.	10.2196/42965	
L. Campillos-Llanos	MedLexSp - a medical lexicon for Spanish medical natural language processing	J Biomed Semantics	2023	14	1	2	Humans, "Natural Language Processing," "covid-19, Language, Vocabulary, Controlled, Unified Medical Language System, Semantics, Medical Lexicon, Natural Language Processing, Spanish, Word embeddings	10.1186/s13326-022-00281-5	
S. Cavalieri, Vener, C., LeBlanc, M., Lopez-Perez, L., Fico, G., Resteghini, C., Monzani, C., Marton, Pravattoni, G., Moreira-Saunders, M., Filippidis, D. E., Almeida, A., Bilbas, A., Mehanna, H., Singer, S., Thomas, S., Lacerenza, L., Manfruso, A., Copelli, C., Mercalli, F., Frigessi, A., Martinielli, E., Licitra, L.	A multicenter randomized trial for quality of life evaluation by non-invasive intelligent tools during post-curative treatment follow-up for head and neck cancer: Clinical study protocol	Front Oncol	2023	13	1048593	B04QoL, QoL, android, head and neck cancer, mHealth, survivorship, unobtrusive, this study, DR is employed by DOTSOFT, Greece. SI discloses the following: conflicts of interest: honoraria from Lilly and Eisai, outside of this study. FM, is employed by MultiMed Engineers, Italy. LI discloses the following conflicts, of interest: research funds donated directly to the institute for clinical trials, in which I participated from: AstraZeneca, BMS, Boehringer Ingelheim, Celgene, International, Eisai, Cellis, Debiopharm International SA, Hoffmann-La Roche, Ltd, IRX Therapeutics, Medpace, Merck-Serono, MSD, Novartis, Pfizer, Roche, Barun, occasional fees for participation as a speaker at conferences/congresses, or as a scientific consultant for	Patients surviving head and neck cancer (HNC) suffer from high physical, psychological, and socioeconomic burdens. Achieving cancer-free survival with an optimal quality of life (QoL) is the primary goal for HNC patient management. So, maintaining lifelong surveillance is critical. An ambitious goal would be to carry this out through the advanced analysis of environmental, emotional, and behavioral data unobtrusively collected from mobile devices. The aim of this clinical trial is to reduce, with non-invasive tools (i.e., patients' mobile devices), the proportion of HNC survivors (i.e., having completed their curative treatment from 3 months to 10 years) experiencing a clinically relevant reduction in QoL during follow-up. The Big Data for Quality of Life (B04QoL) study is an international, multicenter, randomized (2:1), open-label trial. The primary endpoint is a clinically relevant global health-related EORTC QLQ-C30 QoL deterioration (decrease ≥10 points) at any point during 24 months post-treatment follow-up. The target sample size is 420 patients. Patients will be randomized to be followed up using the B04QoL platform or per standard clinical practice. The B04QoL platform includes a set of services to allow patients monitoring and empowerment through two main tools: a mobile application installed on participants' smartphones, that includes a chatbot for e-coaching, and the Point of Care dashboard, to let the investigators manage patients data. In both arms, participants will be asked to complete QoL questionnaires at study entry and once every 6 months, and will undergo post-treatment follow up as per clinical practice. Patients randomized to the intervention arm (n=280) will receive access to the B04QoL platform, those in the control arm (n=140) will not. Eligibility criteria include completing curative treatments for non-metastatic HNC and the use of an Android-based smartphone. Patients undergoing active treatments or with synchronous cancers are excluded. Clinical Trial Registration: ClinicalTrials.gov, identifier (NCT05315570).	10.3389/fonc.2023.1048593	
B. A. Chagas, Pagano, A. S., Prates, R. C., Praes, E. C., Ferrerquetti, K., Vaz, H., Reis, Z. S. N., Ribeiro, L. B., Ribeiro, A. L. P., Pedrosa, T. M., Belegoli, A., Oliveira, C. R. A., Marcolino, M. S.	Evaluating user experience with a chatbot designed as a public health response to the Covid-19 pandemic in Brazil: a mixed-methods study	JMIR Hum Factors	2023				BACKGROUND: The potential of chatbots for screening and monitoring COVID-19 was envisioned since the very outbreak of the disease. Chatbots can help disseminate up-to-date and trustworthy information, promote healthy social behavior and support the provision of healthcare services safely and at scale. In this scenario and in view of its far-reaching post-pandemic impact, it is critically important to evaluate user experience with this kind of application. OBJECTIVE: To evaluate the quality of user experience with a chatbot designed in response to the COVID-19 pandemic by a large telehealth service in Brazil, focusing on an analysis of usability with real users and on an exploration of strengths and shortcomings of the chatbot as revealed in reports by participants in simulated scenarios. METHODS: We examined a chatbot developed by a multidisciplinary team and used as a component within the workflow of a local public healthcare service. The chatbot had two core functionalities: assisting online screening of COVID-19 symptom severity and providing evidence-based information to the population. From October 2020 to January 2021, we conducted a mixed-methods approach and performed a twofold evaluation of user experience with our chatbot by two methods: (i) a post-task usability Likert-scale survey presented to all users upon concluding their interaction with the bot; and (ii) an interview with volunteer participants who engaged in a simulated interaction with the bot guided by the interviewer. RESULTS: Usability assessment with 63 users revealed very good scores for chatbot usefulness (4.57), likelihood of being recommended (4.48), ease of use (4.44) and user satisfaction (4.38). Interviews with 15 volunteers provided insights into strengths and shortcomings in our bot. Comments on positive aspects and problems reported by users were analyzed in terms of recurrent themes. We identified six positive aspects and fifteen issues organized in two main categories: usability of the chatbot and health support offered by it, the former referring to usability of the chatbot and its interactive resources and the latter to the chatbot goal in supporting people during the pandemic through the screening process and education to users through informative content. We found six themes accounting for what people liked most about our chatbot and why they found it useful, three themes pertaining to the usability domain and three regarding health support. Besides positive feedback, our findings identified 15 types of problems producing a negative impact on users, ten of them related to the usability of the chatbot and five related to the health support it provides. CONCLUSIONS: Our results indicate that users had an overall positive experience with the chatbot and found the health support relevant. Nonetheless, the qualitative evaluation of the chatbot indicated challenges and directions to be pursued in improving, not only our COVID chatbot, but health chatbots in general.	10.2196/43135	
S. Chari, Acharya, P., Gruen, D. M., Zhang, O., Eyigors, E. K., Chahalwasi, M., Seneviratne, D., Sati, F. S., Meyer, P., Chakraborty, P., McGuinness, D. L.	Informing clinical assessment by contextualizing post-hoc explanations of risk prediction models in type-2 diabetes	Artificial Intelligence in Medicine	2023	137		article, artificial intelligence, case report, chronic kidney failure, clinical article, clinical assessment, comorbidity, data source, diabetes mellitus, disease simulation, feasibility study, human, language, medical expert, non insulin dependent diabetes mellitus, physician, pipeline, practice guideline, prediction, risk assessment	Medical experts may use Artificial Intelligence (AI) systems with greater trust if these are supported by 'contextual explanations' that let the practitioner connect system inferences to their context of use. However, their importance in improving model usage and understanding has not been extensively studied. Hence, we consider a comorbidity risk prediction scenario and focus on contexts regarding the patients' clinical state. AI predictions about their risk of complications, and algorithmic explanations supporting the predictions. We explore how relevant information for such dimensions can be extracted from Medical guidelines to answer typical questions from clinical practitioners. We identify this as a question answering (QA) task and employ several state-of-the-art Large Language Models (LLM) to present contexts around risk prediction model inferences and evaluate their acceptability. Finally, we study the benefits of contextual explanations by building an end-to-end AI pipeline including data cohorting, AI risk modeling, post-hoc model explanations, and prototyped a visual dashboard to present the combined insights from different context dimensions and data sources, while predicting and identifying the drivers of risk of Chronic Kidney Disease (CKD) - a common type-2 diabetes (T2DM) comorbidity. All of these steps were performed in deep engagement with medical experts, including a final evaluation of the dashboard results by an expert medical panel. We show that LLMs, in particular BERT and GÖBERT, can be readily deployed to extract some relevant explanations to support clinical usage. To understand the value-add of the contextual explanations, the expert panel evaluated these regarding actionable insights in the relevant clinical setting. Overall, our paper is one of the first end-to-end analyses identifying the feasibility and benefits of contextual explanations in a real-world clinical use case. Our findings can help improve clinicians' usage of AI models.	10.1016/j.artmed.2023.102498	https://www.embase.com/search/results?subaction=viewrecord&id=12022603711&from=export http://dx.doi.org/10.1016/j.artmed.2023.102498

J. Chatterjee, Dethlefs, N.	This new conversational AI model can be your friend, philosopher, and guide – and even your worst enemy	Patterns (N Y)	2023	4	1	100676	We explore the recently released ChatGPT model, one of the most powerful conversational AI models that has ever been developed. This option provides a perspective on its strengths and weaknesses and a call to action for the AI community (including academic researchers and industry) to work together on preventing potential misuse of such powerful AI models in our everyday lives.	10.1016/j.patter.2022.100676	
T. J. Chen	ChatGPT and other artificial intelligence applications speed up scientific writing	J Chin Med Assoc	2023					10.1097/jcma.0000000000000900	
X. L. Chen, Cheng, G. R. Y., Zou, D., Zhong, B. C., Xie, H. R.	Artificial Intelligent Robots for Precision Education: A Topic Modeling-Based Bibliometric Analysis	EDUCATIONAL TECHNOLOGY & SOCIETY	2023	26	1	171-186	Artificial intelligence robots, Topic modeling, Bibliometric analysis, Precision education, Research topics, Future of human-centered artificial intelligence, COMMUNICATION, KNOWLEDGE, THINKING, AI	10.30191/ET5.202301_26(1).0013	
Y. Chen, Jansen, S., Albert, L. J., Gupta, S., Lee, T.	Artificial Intelligence (AI) Student Assistants in the Classroom: Designing Chatbots to Support Student Success	Information Systems Frontiers	2023	25	1	161-182	Chatbots, Conversational agents, Higher education, Inclusive learning, Ethical technology, Customer-service, Empirical studies, Ethical concerns, High education, Student success, Teachers', Work productivity, Students	10.1007/s10796-022-10291-4	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85131815976&doi=10.1007%2fs10796-022-10291-4&partnerID=40&md5=6aa0d6994d038dc193f053153331b668
H. Chin, Lima, G., Shin, M., Zhuika, A., Cha, C., Choi, J., Cha, M.	User-Chatbot Conversations During the COVID-19 Pandemic: Study Based on Topic Modeling and Sentiment Analysis	J Med Internet Res	2023	25		e40922	Humans, United States/epidemiology, "COVID-19/epidemiology/prevention & control/psychology, Pandemics, SARS-CoV-2, Sentiment Analysis, "Social Media, Communicable Disease Control, Covid-19, chatbot, conversational agent discourse, global health, health information, infodemiology, infoveillance, public health, public perception, topic modeling	10.2196/40922	
D. Chrimes	Using Decision Trees as an Expert System for Clinical Decision Support for COVID-19	Interact J Med Res	2023	12		e42540	Covid-19, assessment tool, chatbot, clinical decision support, decision tree, digital health tool, framework, health informatics, health intervention, prototype	10.2196/42540	
J. Y. X. Chua, Choolani, M., Chee, C. Y. L., Chan, Y. H., Lalor, J. G., Chong, Y. S., Shorey, S.	Insights of Parents and Parents-To-Be in Using Chatbots to Improve Their Preconception, Pregnancy, and Postpartum Health: A Mixed Studies Review	J Midwifery Womens Health	2023				chatbot, parent, postpartum, preconception, pregnancy, review	10.1111/mjwh.13472	
C. H. Chuang, Lo, J. H., Wu, Y. K.	Integrating Chatbot and Augmented Reality Technology into Biology Learning during COVID-19	Electronics (Switzerland)	2023	12	1		ARCS (Attention Relevance Confidence and Satisfaction) model, augmented reality, chatbot, e-learning	10.3390/electronics12010222	https://www.scopus.com/inward/record.uri?eid=2-s2.0-851459272026&doi=10.3390%2Felectronics12010222&partnerID=40&md5=6d614ef84a09908cdf6bae11b52907
E. Colombaro, Peels, D. A., Bolman, C. A. W., de Bruijn, G. J., Lechner, L.	Adding Mobile Elements to Online Physical Activity Interventions for Adults Aged Over 50 Years: Prototype Development Study	JMIR Form Res	2023	7		e42394	development, eHealth, mHealth, older adults, physical activity, pilot test, prototype, usability	10.2196/42394	
N. Curtis	To ChatGPT or not to ChatGPT? The Impact of Artificial Intelligence on Academic Publishing	Pediatr Infect Dis J	2023					10.1097/inf.0000000000003852	

R. S. D'Amico, White, T. G., Shah, H. A., Langer, D. J.	I Asked a ChatGPT to Write an Editorial About How We Can Incorporate Chatbots Into Neurosurgical Research and Patient Care.	Neurosurgery	2023						10.1227/neu.0000000000002414	
R. Dale	NLP startup funding in 2022	Natural Language Engineering	2023	29	1	162-176	Chatbots, Commercial applications, Fundings, Human language, Machine translations, Sentiment analysis, Virtual assistants	It's no secret that the commercial application of NLP technologies has exploded in recent years. From chatbots and virtual assistants to machine translation and sentiment analysis, NLP technologies are now being used in a wide variety of applications across a range of industries. With the increasing demand for technologies that can process human language, investors have been eager to get a piece of the action. In this article, we look at NLP startup funding over the past year, identifying the applications and domains that have received investment. © The Author(s), 2023. Published by Cambridge University Press.	10.1017/S151324923000013	https://www.scopus.com/inward/record.uri?eid=2-s2.0-8514795767&doi=10.1017%2F%2F151324923000013&partnerID=40&md5=8f26eb841d4e908e3957b079c273d3d
K. Darda, Carne, M., Cross, E.	Value attributed to text-based archives generated by artificial intelligence	R Soc Open Sci	2023	10	2	220915	AI, archives, artificial intelligence, journalism, natural language generation, value	Openly available natural language generation (NLG) algorithms can generate human-like texts across domains. Given their potential, ethical challenges arise such as being used as a tool for misinformation. It is necessary to understand both how these texts are generated from an algorithmic point of view, and how they are evaluated by a general audience. In this study, our aim was to investigate how people react to texts generated algorithmically, whether they are indistinguishable from original/human-generated texts, and the value people assign these texts. Using original text-based archives, and text-based archives generated by artificial intelligence (AI), findings from our preregistered study (N = 228) revealed that people were more likely to preserve original archives compared with AI-generated archives. Although participants were unable to accurately distinguish between AI-generated and original archives, participants assigned lower value to archives they categorized as AI-generated compared with those they categorized as original. People's judgements of value were also influenced by their attitudes toward AI. These findings provide a richer understanding of how the emergent practice of automated text creation alters the practices of readers and writers, and have implications for how readers' attitudes toward AI affect the use and value of AI-based applications and creations.	10.1098/rsos.220915	
A. De la Rosa-Gómez, Waldherr, K.	Editorial: Highlights in digital mental health 2021/22	Frontiers in Digital Health	2023	4			chatbot, COVID-19, depression, engagement, meta-analysis, older adults, social isolation, telemental health (TMH)		10.3389/fdgth.2022.1093375	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147272835&doi=10.3389%2Fdgth.2022.1093375&partnerID=40&md5=a22f6426023f2b21f93485f3a6a3978
T. De Sarkar	Implementing robotics in library services	Library Hi Tech News	2023	40	1	08-Dec	Artificial intelligence, Chatbot, Humanoid robot, Image recognition, Machine learning, Telepresence robot	Purpose: The main purpose of this paper is to explore how robots are being used in the library to transform library services and what are the future possibilities of application of robots in libraries. Design/methodology/approach: Analyzing various library websites and consulting literature relating to the use of robots in libraries, the current application of robots in libraries has been enumerated. Findings: With the practical examples of libraries using different types of robots, this study summarizes diverse activities of artificial intelligence-mediated robots: managing the shelf, controlling circulation workflow, assisting in document retrieval, transporting articles, acting as subject guides, attending reference queries, etc. Originality/value: This paper highlights how the introduction of robots in libraries improves the service productivity and creates a more engaging environment with the user group. The benefits and challenges of using robots in the library and the future possibilities are also discussed. © 2022, Emerald Publishing Limited.	10.1108/LHTN-11-2022-0123	https://www.scopus.com/inward/record.uri?eid=2-s2.0-851451300758&doi=10.1108%2F%2F11HTN-11-2022-0123&partnerID=40&md5=71eace5a8776f907e9805c1d3345db1
S. Demir, Oktun, S.	A benchmark dataset for Turkish data-to-text generation	Computer Speech and Language	2023	77			Biography domain, Crowdsourcing, Data-to-text generation, Dining venue domain, Neural Models, Turkish, Large dataset, Natural language processing systems, Recurrent neural networks, Benchmark datasets, High quality, Learn, Natural language generation, Neural modelling, Text generations, Turkish	In the last decades, data-to-text (D2T) systems that directly learn from data have gained a lot of attention in natural language generation. These systems need data with high quality and large volume, but unfortunately some natural languages suffer from the lack of readily available generation datasets. This article describes our efforts to create a new Turkish dataset (Tt-D2T) that consists of meaning representation and reference sentence pairs without fine-grained word alignments. We utilize Turkish web resources and existing datasets in other languages for producing meaning representations and collect reference sentences by crowdsourcing native speakers. We particularly focus on the generation of single-sentence biographies and dining venue descriptions. In order to motivate future Turkish D2T studies, we present detailed benchmarking results of different sequence-to-sequence neural models trained on this dataset. To the best of our knowledge, this work is the first of its kind that provides preliminary findings and lessons learned from the creation of a new Turkish D2T dataset. Moreover, our work is the first extensive study that presents generation performances of transformer and recurrent neural network models from meaning representations in this morphologically-rich language. © 2022 Elsevier Ltd	10.1016/j.csl.2022.101433	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85134849907&doi=10.1016%2F%2Fcsl.2022.101433&partnerID=40&md5=70b2b046389df4507c13e3323700006
D. Dippold	"Can I have the scan on Tuesday?" User repair in interaction with a task-oriented chatbot and the question of communication skills for AI	Journal of Pragmatics	2023	204		21-32	Artificial intelligence, Chatbots, Conversational AI, Human-computer interaction, Repair	Repair describes the process through which participants in conversation address problems in speaking, understanding, and hearing. In interactions with AI-driven chatbots, user repair addresses chatbots' lack of understanding or misunderstanding of the user's intent. This paper represents a user-centred description of user repair strategies in interactions with a task-oriented chatbot. It is based on the analysis of simulated user interactions with a chatbot facilitating health appointment bookings. The analysis shows that the repair strategies which users draw on most frequently (e.g., rephrasing) are not necessarily the ones which prompt the bot to correctly recognise intent and provide relevant responses, whereas the less frequently used self-repair strategies (e.g. restating the intent) are more successful in achieving intent recognition. This suggest that the rules of interaction with conversational AI need to be made explicit to users as they lack familiarity with the context, limitations and patterning of interactions facilitated through AI. © 2022 The Author(s)	10.1016/j.pragma.2022.12.004	https://www.scopus.com/inward/record.uri?eid=2-s2.0-851447262361&doi=10.1016%2F%2Fj.pragma.2022.12.004&partnerID=40&md5=81f886c539f7c6bf0c10c1b6249
C. Diwan, Srinivasa, S., Suri, G., Agarwal, S., Ram, P.	AI-based learning content generation and learning pathway augmentation to increase learner engagement	Computers and Education: Artificial Intelligence	2023	4			Automatic question generation, Curating learning pathways, Definition generation, Educational content generation, Language models, Learner engagement, Multiple choice question, Open educational resources	Retaining learner engagement is a major challenge in online learning environments, which is even more intensified with learning spaces increasingly built by combining resources from multiple independent sources. Narrative-centric learning experience has been found to improve learner engagement by several researchers. Towards this end, we propose an AI-based approach that generates auxiliary learning content called narrative fragments which are interspersed into the learning pathways to create interactive learning narratives. The proposed approach consists of the automatic generation of two types of narrative fragments— overviews of the learning pathway segments and reflection quizzes or formative assessments from learning resources in any format including open educational resources. The pipeline for the generation of the narrative fragments consists of various components based on different semantic models and a natural language generation (NLG) component based on a pre-trained language model GPT-2 (Generative Pre-trained Transformer 2). Automation enables the generation of narrative fragments on the fly whenever there are changes in the learning pathway due to the need for reiteration of concepts, pre-requisite knowledge acquisition, etc., enabling adaptability in the learning pathways. The proposed approach is domain agnostic which makes it easily adaptable to different domains. The NLG model is evaluated using ROUGE scores against several baselines. Automatically generated narrative fragments are evaluated by human evaluators. We obtained encouraging results in both cases. © 2022 The Authors	10.1016/j.caeai.2022.100110	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143972720&doi=10.1016%2F%2Fj.caeai.2022.100110&partnerID=40&md5=c5f321ae8ac539f7c6bf0c10c1b6249
H. Donato, Escada, P., Villanueva, T.	The Transparency of Science with ChatGPT and the Emerging Artificial Intelligence Language Models: Where Should Medical Journals Stand?	Acta Med Port	2023				Artificial Intelligence, Authorship, Ethics, Publishing, Research, Science/ethics		10.20344/amp.19694	
G. Dosovitskiy, Bunge, E.	Development of a chatbot for depression: adolescent perceptions and recommendations	Child Adolesc Ment Health	2023	28	1	124-127	Adults, Humans, Adolescent, "Depression"/therapy, Communication, "Mental Disorders, Mental Health, Software, Chatbots, behavioral activation, conversational agent, depression, digital intervention	BACKGROUND: Chatbots are a relatively new technology that has shown promising outcomes for mental health symptoms in adults; however, few studies have been done with adolescent user experiences and recommendations for chatbot development. METHODS: Twenty three participants ages 13-18 (M[age] = 14.96) engaged in user testing of a chatbot developed to psychoeducate adolescents on depression, teach behavioral activation, and change negative thoughts. Thematic analysis was conducted of participants' responses to user experience questions, impressions, and recommendations. RESULTS: Over half (56.5%) of the sample completed the full intervention and provided user experience feedback online. The average NPS score was 6.04 (SD = 2.18), and 64.3% (n = 9) said they would use the chatbot in the future. Of all user experience responses, 54.5% were positive. The most common impressions were related to symptom improvement (61.1%) and availability (52.8%) The most frequent recommendations were related to solving technical problems (66%). CONCLUSIONS: Chatbots for mental health are acceptable to some adolescents, a population that tends to be reluctant to engage with traditional mental health services. Most participants reported positive experiences with the chatbot, believing that it could help with symptom improvement and is highly available. Adolescents highlighted some technical and stylistic problems that developers should consider. More pilot and user testing is needed to develop mental health chatbots that are appealing and relevant to adolescents.	10.1111/camh.12627	
Drakshayini, Kumar, N. T., Mohan, S. T.	Evolution of Chatbots Using Artificial Intelligence and Machine Learning	European Journal of Molecular and Clinical Medicine	2023	10	1	3127-3134	algorithm, article, artificial intelligence, chatbot, human, human experiment, machine learning, natural language processing	Artificial Machine Intelligence is a very complicated topic. It involves creating machines that are capable of simulating knowledge. This paper examines some of the latest AI patterns and activities and then provides alternative theory of change in some of the popular and widely accepted postulates of today. Based on basic A.I. (Artificial Intelligence) structuring and working for this, System-Chatbots are made (or chatter bots). The paper shows that AI is ever improving. The paper comes under a major Domain of AI. It also has a sub domain as machine learning, because machine learning algorithm is used in this paper. The scope of this paper is to show the closest match of the input which is provided by the customer. It interacts with a customer until the customer queries get solved. It is used in the business website purpose. Natural Language Processing, allowing users to communicate with college interactive agent using natural language input and to train interactive agent using appropriate Machine Learning methods so it will be able to generate a response. There are numerous applications that are incorporating a human appearance and intending to simulate human dialog, yet in most part of the cases knowledge of Interactive agent is stored in a database created by a human expert.		https://www.embase.com/search/results?subaction=viewrecord&id=12022369750&from=export
D. Duong, Solomon, B. D.	Analysis of large language model versus human performance for genetics questions	medRxiv	2023					Large-language models like ChatGPT have recently received a great deal of attention. To assess ChatGPT in the field of genetics, we compared its performance to human respondents in answering genetics questions (involving 13,636 responses) that had been posted on social media platforms starting in 2021. Overall, ChatGPT did not perform significantly differently than human respondents, but did significantly better on memorization-type questions versus critical thinking questions, frequently provided different answers when asked questions multiple times, and provided plausible explanations for both correct and incorrect answers.	10.1101/2023.01.27.23285115	
E. Durall Gasulla, Martins, L., Fernández-Ferrer, M.	Designing learning technology collaboratively: Analysis of a chatbot co-design	Educ Inf Technol (Dordr)	2023	28	1	109-134	Action research, Chatbot, Collaborative design, Conversational interface, Learning technology, Technology-enhanced learning	Collaborative design approaches have been increasingly adopted in the design of learning technologies since they contribute to develop pedagogically inclusive and appropriate design. Despite the positive reception of collaborative design strategies in technology-enhanced learning, little attention has been dedicated to analysing the challenges faced in design processes using a collaborative approach. In this paper, we disclose the collaborative design of a chatbot for self-regulated learning in higher education using an action research approach. We analyze the design process of EDUGuía chatbot, which includes diverse evidence from questionnaires and workshops with students and lecturers, as well as intermediary design objects. Based on the qualitative analysis, we identify several challenges that are transversal to the co-design work, as well as specific to the design phases. We critically reflect on the strategies deployed to overcome these challenges and how they relate to decision-making processes, highlighting the need to make stakeholders' tacit knowledge explicit, cultivate trust-building and support democratic decision-making in technology design processes. We believe that the recommendations we present in this paper contribute to developing best practices in the collaborative design of chatbots for the self-regulation of learning, as well as learning technology in general. SUPPLEMENTARY INFORMATION: The online version contains supplementary material available at 10.1007/10639-022-11162-w.	10.1007/s10639-022-11162-w	

K. K. Dysthe, Rusborg, J. I., Brandtzaeg, P. B., Skjve, M., Haavet, O. R., Følstad, A., Klovning, A.	Analyzing User-Generated Web-Based Posts of Adolescents' Emotional, Behavioral, and Symptom Responses to Beliefs About Depression: Qualitative Thematic Analysis	J Med internet Res	2023	25	e37289	Humans, Adolescent, "Depression"/therapy, Emotions, "Mental Disorders, Adaptation, Psychological, Internet, cognitive behavioral therapy, depression, early medical intervention, education, health literacy, preventive psychiatry	BACKGROUND: Depression is common during adolescence. Early intervention can prevent it from developing into more progressive mental disorders. Combining information technology and clinical psychoeducation is a promising way to intervene at an earlier stage. However, data-driven research on the cognitive response to health information targeting adolescents with symptoms of depression is lacking. OBJECTIVE: This study aimed to fill this knowledge gap through a new understanding of adolescents' cognitive response to health information about depression. This knowledge can help to develop population-specific information technology, such as chatbots, in addition to clinical therapeutic tools for use in general practice. METHODS: The data set consists of 1870 depression-related questions posted by adolescents on a public web-based information service. Most of the posts contain descriptions of events that lead to depression. On a sample of 100 posts, we conducted a qualitative thematic analysis based on cognitive behavioral theory investigating behavioral, emotional, and symptom responses to beliefs associated with depression. RESULTS: Results were organized into four themes: (1) Hopelessness, appearing as a set of negative beliefs about the future, possibly results from erroneous beliefs about the causal link between risk factors and the course of depression. We found beliefs about establishing a sturdy therapy alliance as a responsibility resting on the patient. (2) Therapy hesitancy seemed to be associated with negative beliefs about therapy prognosis and doubts about confidentiality. (3) Social shame appeared as a consequence of impaired daily function when the cause is not acknowledged. (4) Failing to attain social interaction appeared to be associated with a negative symptom response. In contrast, actively obtaining social support reduces symptoms and suicidal thoughts. CONCLUSIONS: These results could be used to meet the clinical aims stated by earlier psychoeducation development, such as instilling hope through direct redistribution of beliefs about the future; challenging causal attributions, thereby lowering therapy hesitancy; reducing shame through the mechanisms of externalization by providing a tentative diagnosis despite the risk of stigmatizing; and providing initial symptom relief by giving advice on how to open up and reveal themselves to friends and family and balance the message of self-management to fit coping capabilities. An active counseling style advises the patient to approach the social environment, demonstrating an attitude toward self-action.	10.2196/37289	
H. Else	Abstracts written by ChatGPT fool scientists	Nature	2023	613	7944	423	*Machine Learning/standards, "Writing/standards, "Research Personnel, Authorship/standards, "Research Report/standards, Machine learning, Mathematics and computing, Publishing	10.1038/d41586-023-00056-7	
G. A. Entenberg, Mizrahi, S., Walker, H., Aghakhani, S., Mostovoy, K., Carre, N., Marshall, Z., Dosovitsky, G., Benfica, D., Rousseau, A., Lin, G., Bunge, E. L.	AI-based chatbot micro-intervention for parents: Meaningful engagement, learning, and efficacy	Front Psychiatry	2023	14	1080770	AI, artificial intelligence, chatbot, efficacy, intervention, learning, parenting, commercial or financial relationships that could be construed as a potential, conflict of interest.	INTRODUCTION: Mental health issues have been on the rise among children and adolescents, and digital parenting programs have shown promising outcomes. However, there is limited research on the potential efficacy of utilizing chatbots to promote parental skills. This study aimed to understand whether parents learn from a parenting chatbot micro intervention, to assess the overall efficacy of the intervention, and to explore the user characteristics of the participants, including parental busyness, assumptions about parenting, and qualitative engagement with the chatbot. METHODS: A sample of 170 parents with at least one child between 2-11 years old were recruited. A randomized control trial was conducted. Participants in the experimental group accessed a 15-min intervention that taught how to utilize positive attention and praise to promote positive behaviors in their children, while the control group remained on a waiting list. RESULTS: Results showed that participants engaged with a brief AI-based chatbot intervention and were able to learn effective praising skills. Although scores moved in the expected direction, there were no significant differences by condition in the praising knowledge reported by parents, perceived changes in disruptive behaviors, or parenting self-efficacy, from pre-intervention to 24-hour follow-up. DISCUSSION: The results provided insight to understand how parents engaged with the chatbot and suggests that, in general, brief, self-guided, digital interventions can promote learning in parents. It is possible that a higher dose of intervention may be needed to obtain a therapeutic change in parents. Further research implications on chatbots for parenting skills are discussed.	10.3389/psyt.2023.1080770	
G. A. Entenberg, Dosovitsky, G., Aghakhani, S., Mostovoy, K., Carre, N., Marshall, Z., Benfica, D., Rousseau, A., Lin, G., Bunge, E. L.	User experience with a parenting chatbot micro intervention	Frontiers in Digital Health	2023	4		artificial intelligence, chatbot, conversational agent intervention, parenting, user experience (UX)	Background: The use of chatbots to address mental health conditions have become increasingly popular in recent years. However, few studies aimed to teach parenting skills through chatbots, and there are no reports on parental user experience. Aim: This study aimed to assess the user experience of a parenting chatbot micro intervention to teach how to praise children in a Spanish-speaking country. Methods: A sample of 89 parents were assigned to the chatbot micro intervention as part of a randomized controlled trial study. Completion rates, engagement, satisfaction, net promoter score, and acceptability were analyzed. Results: 66.3% of the participants completed the intervention. Participants exchanged an average of 49.8 messages (SD = 1.53), provided an average satisfaction score of 4.19 (SD = 79), and reported that they would recommend the chatbot to other parents (net promoter score = 4.63/5; SD = 66). Acceptability level was high (ease of use = 4.66 [SD = 73]; comfortability = 4.76 [SD = 46]; lack of technical problems = 4.69 [SD = 59]; interactivity = 4.51 [SD = 77]; usefulness for everyday life = 4.75 [SD = 54]). Conclusions: Overall, users completed the intervention at a high rate, engaged with the chatbot, were satisfied, would recommend it to others, and reported a high level of acceptability. Chatbots have the potential to teach parenting skills however research on the efficacy of parenting chatbot interventions is needed. 2023 Entenberg, Dosovitsky, Aghakhani, Mostovoy, Carre, Marshall, Benfica, Mizrahi, Testerman, Rousseau, Lin and Bunge.	10.3389/fdgth.2022.989022	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147019828&doi=10.3389%2Ffdgth.2022.989022&partnerID=40&md5=f659a1d175f9e455a3c1d113b560c466
G. A. Entenberg, Mizrahi, S., Walker, H., Aghakhani, S., Mostovoy, K., Carre, N., Marshall, Z., Dosovitsky, G., Benfica, D., Rousseau, A., Lin, G., Bunge, E. L.	AI-based chatbot micro-intervention for parents: Meaningful engagement, learning, and efficacy	FRONTIERS IN PSYCHIATRY	2023	14		chatbot, parenting, artificial intelligence, learning, efficacy, intervention, AI, EXTERNALIZING BEHAVIOR PROBLEMS, MENTAL-HEALTH PROBLEMS, DISRUPTIVE BEHAVIORS, CHILDREN, METAANALYSIS, ADOLESCENTS, CHALLENGES, STRATEGIES, EDUCATION, CARE	Introduction: Mental health issues have been on the rise among children and adolescents, and digital parenting programs have shown promising outcomes. However, there is limited research on the potential efficacy of utilizing chatbots to promote parental skills. This study aimed to understand whether parents learn from a parenting chatbot micro intervention, to assess the overall efficacy of the intervention, and to explore the user characteristics of the participants, including parental busyness, assumptions about parenting, and qualitative engagement with the chatbot. Methods: A sample of 170 parents with at least one child between 2-11 years old were recruited. A randomized control trial was conducted. Participants in the experimental group accessed a 15-min intervention that taught how to utilize positive attention and praise to promote positive behaviors in their children, while the control group remained on a waiting list. Results: Results showed that participants engaged with a brief AI-based chatbot intervention and were able to learn effective praising skills. Although scores moved in the expected direction, there were no significant differences by condition in the praising knowledge reported by parents, perceived changes in disruptive behaviors, or parenting self-efficacy, from pre-intervention to 24-hour follow-up. Discussion: The results provided insight to understand how parents engaged with the chatbot and suggests that, in general, brief, self-guided, digital interventions can promote learning in parents. It is possible that a higher dose of intervention may be needed to obtain a therapeutic change in parents. Further research implications on chatbots for parenting skills are discussed.	10.3389/psyt.2023.1080770	
K. Epalte, Tomson, S., Větra, A., Běřina, G.	Patient experience using digital therapy "Vigo" for stroke patient recovery: a qualitative descriptive study	Disabil Rehabil Assist Technol	2023	18	2	175-184	Humans, "Stroke Rehabilitation, Artificial Intelligence, "Stroke, Qualitative Research, Patient Outcome Assessment, Stroke, digital therapeutic, qualitative study, rehabilitation	10.1080/17483107.2020.1839794	
H. Fan, Gao, W., Han, B.	Are AI chatbots a cure-all? The relative effectiveness of chatbot ambidexterity in crafting hedonic and cognitive smart experiences	Journal of Business Research	2023	156			Chatbot ambidexterity, Dual process models, Polynomial regression, Response surface analysis, Smart experiences	10.1016/j.jbusres.2022.113526	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145611911&doi=10.1016%2Fj.jbusres.2022.113526&partnerID=40&md5=b1e664c640fed2c26bf1a1d1bfff05e
J. Fan, Sun, T., Liu, J., Zhao, T., Zhang, B., Chen, Z., Glorioso, M., Hack, E.	How well can an AI chatbot infer personality? Examining psychometric properties of machine-inferred personality scores	J Appl Psychol	2023				The present study explores the plausibility of measuring personality indirectly through an artificial intelligence (AI) chatbot. This chatbot mines various textual features from users' free text responses collected during an online conversation/interview and then uses machine learning algorithms to infer personality scores. We comprehensively examine the psychometric properties of the machine-inferred personality scores, including reliability (internal consistency, split-half, and test-retest), factorial validity, convergent and discriminant validity, and criterion-related validity. Participants were undergraduate students (n = 1,444) enrolled in a large southeastern public university in the United States who completed a self-report Big Five personality measure (PIP-300) and engaged with an AI chatbot for approximately 20-30 min. In a subsample (n = 407), we obtained participants' cumulative grade point averages from the University Registrar and had their peers rate their college adjustment. In an additional sample (n = 61), we obtained test-retest data. Results indicated that machine-inferred personality scores (a) had overall acceptable reliability at both the domain and facet levels, (b) yielded a comparable factor structure to self-reported questionnaire-derived personality scores, (c) displayed good convergent validity but relatively poor discriminant validity (averaged convergent correlations = .48 vs. averaged machine-score correlations = .35 in the test sample), (d) showed low criterion-related validity, and (e) exhibited incremental validity over self-reported questionnaire-derived personality scores in some analyses. In addition, there was strong evidence for cross-sample generalizability of psychometric properties of machine scores. Theoretical implications, future research directions, and practical considerations are discussed. (PsycInfo Database Record (c) 2023 APA, all rights reserved).	10.1037/ap0001082	

F. Ferré, Laurent, R., Furel, A., P., Doumard, E., Ferrier, A., Bouch, L., Ba, C., Menut, R., Kurrek, M., Geeraerts, T., Piau, A., Minville, V.	Perioperative Risk Assessment of Patients Using the MyRisk Digital Score Completed Before the Preanesthetic Consultation: Prospective Observational Study	JMIR Perioper Med	2023	6	e39044	chatbot, digital health, machine learning, mobile phone, perioperative risk, preanesthetic consultation	BACKGROUND: The ongoing COVID-19 pandemic has highlighted the potential of digital health solutions to adapt the organization of care in a crisis context. OBJECTIVE: Our aim was to describe the relationship between the MyRisk score, derived from self-reported data collected by a chatbot before the preanesthetic consultation, and the occurrence of postoperative complications. METHODS: This was a single-center prospective observational study that included 401 patients. The 16 items composing the MyRisk score were selected using the Delphi method. An algorithm was used to stratify patients with low (green), intermediate (orange), and high (red) risk. The primary end point concerned postoperative complications occurring in the first 6 months after surgery (composite criterion), collected by telephone and by consulting the electronic medical database. A logistic regression analysis was carried out to identify the explanatory variables associated with the complications. A machine learning model was trained to predict the MyRisk score using a larger data set of 1823 patients classified as green or red to reclassify individuals classified as orange as either modified green or modified red. User satisfaction and usability were assessed. RESULTS: Of the 389 patients analyzed for the primary end point, 16 (4.1%) experienced a postoperative complication. A red score was independently associated with postoperative complications (odds ratio 5.9, 95% CI 1.5-22.3; P=0.009). A modified red score was strongly correlated with postoperative complications (odds ratio 21.8, 95% CI 2.8-171.5; P<0.03) and predicted postoperative complications with high sensitivity (94%) and high negative predictive value (99%) but with low specificity (49%) and very low positive predictive value (7%; area under the receiver operating characteristic curve=0.71). Patient satisfaction numeric rating scale and system usability scale median scores were 8.0 (IQR 7.0-9.0) out of 10 and 90.0 (IQR 82.5-95.0) out of 100, respectively. CONCLUSIONS: The MyRisk digital perioperative risk score established before the preanesthetic consultation was independently associated with the occurrence of postoperative complications. Its negative predictive strength was increased using a machine learning model to reclassify patients identified as being at intermediate risk. This reliable numerical categorization could be used to objectively refer patients with low risk to teleconsultation.	10.2196/39044	
N. Fijačko, Gosak, L., Štiglic, G., Picard, C. T., John Downs, M.	Can ChatGPT Pass the Life Support Exams without Entering the American Heart Association Course?	Resuscitation	2023		109732	ChatGPT, Large language model, advance cardiovascular life support, artificial intelligence, basic life support, educational assessment		10.1016/j.resuscitation.2023.109732	
A. T. Gabrielson, Odisio, A. Y., Canes, D.	Harnessing Generative AI to Improve Efficiency Among Urologists: Welcome ChatGPT	J Urol	2023		101097	administrative efficiency, artificial intelligence		10.1097/jui.00000000000003383	
Y. Gao, Dilgach, D., Miller, T., Caskey, J., Sharma, B., Churpek, M., Afshar, M.	DR.BENCH: Diagnostic Reasoning Benchmark for Clinical Natural Language Processing	J Biomed Inform	2023	138	104286	Clinical diagnostic decision support, Clinical diagnostic reasoning, Clinical natural language processing benchmark, Natural language processing, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	The meaningful use of electronic health records (EHR) continues to progress in the digital era with clinical decision support systems augmented by artificial intelligence. A priority in improving provider experience is to overcome information overload and reduce the cognitive burden so fewer medical errors and cognitive biases are introduced during patient care. One major type of medical error is diagnostic error due to systematic or predictable errors in judgement that rely on heuristics. The potential for clinical natural language processing (cNLP) to model diagnostic reasoning in humans with forward reasoning from data to diagnosis and potentially reduce cognitive burden and medical error has not been investigated. Existing tasks to advance the science in cNLP have largely focused on information extraction and named entity recognition through classification tasks. We introduce a novel suite of tasks coined as Diagnostic Reasoning Benchmarks, Dr.Bench, as a new benchmark for developing and evaluating cNLP models with clinical diagnostic reasoning ability. The suite includes six tasks from ten publicly available datasets addressing clinical text understanding, medical knowledge reasoning, and diagnosis generation. DR.BENCH is the first clinical suite of tasks designed to be a natural language generation framework to evaluate pre-trained language models for diagnostic reasoning. The goal of DR.BENCH is to advance the science in cNLP to support downstream applications in computerized diagnostic decision support and improve the efficiency and accuracy of healthcare providers during patient care. We fine-tune and evaluate the state-of-the-art generative models on DR.BENCH. Experiments show that with domain adaptation pre-training on medical knowledge, the model demonstrated opportunities for improvement when evaluated in DR.BENCH. We share DR.BENCH as a publicly available GitHub repository with a systematic approach to load and evaluate models for the cNLP community. We also discuss the carbon footprint produced during the experiments and encourage future work on DR.BENCH to report the carbon footprint.	10.1016/j.jbi.2023.104286	
A. N. Guseimlan, Kaufman, E. M., Marcotte, A. S., Reynolds, T. A., Garcia, J. R.	Engagement with Emerging Forms of Sextech: Demographic Correlates from a National Sample of Adults in the United States	J Sex Res	2023	60	2 177-189	Male, Humans, Adult, United States, Female, "Sexual Behavior," "Sexual and Gender Minorities, Erotica, Internet, Demography	Social technology is ever-evolving, and increasingly offers novel domains for sexual experiences. In the current study, we investigated demographic correlates of engagement with emerging forms of sextech, defined here as internet-based applications, platforms, or device used for sexual pleasure. Our web-based, demographically representative sample included 7,512 American adults aged 18-65 years, with a near-even gender split of men/women and moderate racial diversity (63% White). Participants indicated their engagement with eight forms of sextech, including six emerging forms of sexual technology (visiting erotic camming sites, participating in camming streams, teledildonic use, accessing virtual reality pornography, playing sexually explicit video games, and sexual messaging with chatbots or artificially intelligent entities) as well as two more common domains (online pornography and sexting). Participants who were younger, were men, had higher income, and were sexual minorities reported more frequent engagement with all forms of sextech assessed. Unlike prior work on pornography, religious individuals were more likely to engage with emerging sextech. Beyond online pornography (50%) and sexting (29%), visiting camming sites (18%) and playing sexually explicit video games (13%) were relatively common. Findings may contribute to the destigmatization of sextech engagement and forecast future norms in technologically-facilitated sexual behavior.	10.1080/00224499.2021.2007521	
P. Gibson	Enacting Empowerment Through an Automated Teaching Event: A Posthuman and Political Perspective	Postdigital Science and Education	2023	5	1 77-99	Affirmative ethics, Algorithm, Automated teaching, Automation, Posthumanism	This paper problematises the way that the power of the automated teacher is understood by arguing that the question of power is not a humanist one, concerned with human/technology oppositions, but rather, it can be understood as a posthuman question, concerned with automated teaching as an ethically regulated process. Research has largely ignored the political aspect of these covert shifts of power from humans to technology. This paper reports on a chatbot that was developed to co-teach with a human teacher at a UK University, 'Flors' the Teacherbot imbues posthumanist perspectives while attempting to understand automated teaching in a more relational, rather than a transmissive, way. Cartographies draw upon a qualitative analysis of the data to map the political experiences of the students as they collectively author a narrative with(in) Flors. It is at a somewhat whimsical juncture, where Flors remixes the story, that Flors' agential capacity as a co-author is encountered. Through such intra-relational teaching moments, student expressions of adequate understandings around the restrictive and empowering forces emerge. I suggest that, when the political structures within an automated teacher are acknowledged, it is possible to understand authority as something other than a one-directional form of control, but rather a relational encounter with freedom. © 2022, The Author(s), under exclusive licence to Springer Nature Switzerland AG.	10.1007/s42438-022-00346-9	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85141606617&doi=10.1007%2F42438-022-00346-9&partnerID=40&md5=df56893e860462fa194776727f56eb6
A. Gilson, Safrane, C. W., Huang, T., Soares, V., Chi, L., Taylor, R. A., Catchash, D.	How Does ChatGPT Perform on the United States Medical Licensing Examination? The Implications of Large Language Models for Medical Education and Knowledge Assessment	JMIR Med Educ	2023	9	e45312	ChatGPT, Gpt, MedQA, Nlp, artificial intelligence, chatbot, conversational agent, education technology, generative pre-trained transformer, machine learning, medical education, natural language processing	BACKGROUND: Chat Generative Pre-trained Transformer (ChatGPT) is a 175-billion-parameter natural language processing model that can generate conversation-style responses to user input. OBJECTIVE: This study aimed to evaluate the performance of ChatGPT on questions within the scope of the United States Medical Licensing Examination Step 1 and Step 2 exams, as well as to analyze responses for user interpretability. METHODS: We used 2 sets of multiple-choice questions to evaluate ChatGPT's performance, each with questions pertaining to Step 1 and Step 2. The first set was derived from AMBOSS, a commonly used question bank for medical students, which also provides statistics on question difficulty and the performance on an exam relative to the user base. The second set was the National Board of Medical Examiners (NBME) free 120 questions. ChatGPT's performance was compared to 2 other large language models, GPT-3 and InstructGPT. The text output of each ChatGPT response was evaluated across 3 qualitative metrics: logical justification of the answer selected, presence of information internal to the question, and presence of information external to the question. RESULTS: Of the 4 data sets, AMBOSS-Step1, AMBOSS-Step2, NBME-Free-Step1, and NBME-Free-Step2, ChatGPT achieved accuracies of 44% (44/100), 42% (42/100), 64.4% (56/87), and 57.8% (59/102), respectively. ChatGPT outperformed InstructGPT by 8.15% on average across all data sets, and GPT-3 performed similarly to random chance. The model demonstrated a significant decrease in performance as question difficulty increased [P<0.1] within the AMBOSS-Step1 data set. We found that logical justification for ChatGPT's answer selection was present in 100% of outputs of the NBME data sets. Internal information to the question was present in 96.8% (183/189) of all questions. The presence of information external to the question was 44.5% and 27% lower for incorrect answers relative to correct answers on the NBME-Free-Step1 (P<0.01) and NBME-Free-Step2 (P<0.001) data sets, respectively. CONCLUSIONS: ChatGPT marks a significant improvement in natural language processing models on the tasks of medical question answering. By performing at a greater than 60% threshold on the NBME-Free-Step1 data set, we show that the model achieves the equivalent of a passing score for a third-year medical student. Additionally, we highlight ChatGPT's capacity to provide logic and informational context across the majority of answers. These facts taken together make a compelling case for the potential applications of ChatGPT as an interactive medical education tool to support learning.	10.2196/45312	
C. S. Gonzalez-Gonzalez, Munoz-Cruz, V., Toledo-Deigado, P. A., Nacimiento-Garcia, E.	Personalized Gamification for Learning: A Reactive Chatbot Architecture Proposal	SENSORS	2023	23	1	open learner modeling, gamification, chatbots, personalization, game learning analytics, user modeling, EDUCATION, SYSTEMS, STYLES, GAMES	A key factor for successfully implementing gamified learning platforms is making students interact with the system from multiple digital platforms. Learning platforms that try to accomplish all their objectives by concentrating all the interactions from users with them are less effective than initially believed. Conversational bots are ideal solutions for cross-platform user interaction. In this paper, an open student-player model is presented. The model includes the use of machine learning techniques for online adaptation. Then, an architecture for the solution is described, including the open model. Finally, the chatbot design is addressed. The chatbot architecture ensures that its reactive nature fits into our defined architecture. The approach's implementation and validation aim to create a tool to encourage kids to practice multiplication tables playfully.	10.3390/s23010545	
C. González-Mora, Barros, C., Garrigó, I., Zuboff, J., Lloret, E., Mazón, J. N.	Improving open data web API documentation through interactivity and natural language generation	Computer Standards and Interfaces	2023	83		Natural language generation, Natural language processing, OpenAPI documentation, Web API, Application programming interfaces (API), Open Data, Reusability, Applications programming interfaces, Data web, Data-source, Interactivity, Open datum, WEB application, Web application programming interface, Web applications, Natural language processing systems	Widely adoption of Information Technologies has resulted in the continuous growing of open data available on the Web. However, the lack of suitable mechanisms to understand open data sources hampers its reusability. One way to overcome this limitation is by means of Web Application Programming Interfaces (APIs) with proper documentation, nowadays being the existing very rudimentary, hard to follow, and sometimes incomplete or even inaccurate in most cases. In order to improve the documentation of Web APIs that access open data, this paper proposes a novel approach to automatically generate interactive Web API documentation, both machine and user readable. This process starts by analysing the documentation of an API to obtain important information, automatically constructing Natural Language descriptions of the main Web API concepts by applying Natural Language Processing (NLP), and specifically, language generation techniques. Then, the documentation is made interactive by making it available as a Web interface, offering easy access to open data provided by Web APIs. Therefore, the use and comprehension of the Web APIs is facilitated, thus promoting the reusability of open data. The feasibility of our approach is presented through a case study and an experiment with users, both showing the benefits of our approach. © 2022 Elsevier B.V.	10.1016/j.csi.2022.103657	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85130629673&doi=10.1016%2Fcs.2022.103657&partnerID=40&md5=5286c2e5792062c2eadbee7578dc9d
C. González-Mora, Barros, C., Garrigó, I., Zuboff, J., Lloret, E., Maz, J. N.	Improving open data web API documentation through interactivity and natural language generation	COMPUTER STANDARDS & INTERFACES	2023	83		Web API, OpenAPI documentation, Natural language processing, Natural language generation	Widely adoption of Information Technologies has resulted in the continuous growing of open data available on the Web. However, the lack of suitable mechanisms to understand open data sources hampers its reusability. One way to overcome this limitation is by means of Web Application Programming Interfaces (APIs) with proper documentation, nowadays being the existing very rudimentary, hard to follow, and sometimes incomplete or even inaccurate in most cases. In order to improve the documentation of Web APIs that access open data, this paper proposes a novel approach to automatically generate interactive Web API documentation, both machine and user readable. This process starts by analysing the documentation of an API to obtain important information, automatically constructing Natural Language descriptions of the main Web API concepts by applying Natural Language Processing (NLP), and specifically, language generation techniques. Then, the documentation is made interactive by making it available as a Web interface, offering easy access to open data provided by Web APIs. Therefore, the use and comprehension of the Web APIs is facilitated, thus promoting the reusability of open data. The feasibility of our approach is presented through a case study and an experiment with users, both showing the benefits of our approach.	10.1016/j.csi.2022.103657	

B. Gordijn, Have, H. T.	ChatGPT: evolution or revolution?	Med Health Care Philos	2023						10.1007/s11019-023-10136-0	
F. Graham	Daily briefing: ChatGPT listed as author on research papers	Nature	2023						10.1038/d41586-023-00188-w	
F. Graham	Daily briefing: Science urgently needs a plan for ChatGPT	Nature	2023						10.1038/d41586-023-00360-2	
F. Graham	Daily briefing: The science underlying the Turkey-Syria earthquake	Nature	2023					earthquake, note. race. Syrian Arab Republic, Turkey (republic)	10.1038/d41586-023-00373-x	https://www.embase.com/search/results?subaction=viewrecord&id=L2021376530&from=export,http://dx.doi.org/10.1038/d41586-023-00373-x
B. Guerrero-Bocanegra	Analysis of the Social Dimension in the Interactions in the UNED Hosting Forums and Its Implications for the Design of a Chatbot for Educational Guidance	Revista Electronica Educare	2023	27	1			chatbot, distance education, induction virtual communities, social dimension	10.15359/ree.27-1.15844	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146459469&doi=10.15359/ree.27-1.15844&partnerID=40&md5=5-d9dfdb071815e9f8d10368cd93b2c0
S. A. Hadri, Bouramou, A.	Towards a deep learning based contextual chat bot for preventing depression in young children with autistic spectrum disorder	Smart Health	2023	27				article, artificial intelligence, autism, chatbot, child, child psychiatry, deep learning, depression, female, human, machine learning, male, prevention	10.1016/j.smhl.2022.100371	https://www.embase.com/search/results?subaction=viewrecord&id=L2022052335&from=export,http://dx.doi.org/10.1016/j.smhl.2022.100371
J. E. Hallsworth, Udaondo, Z., Pedr�s-Al�, C., H�fer, J., Benison, K. C., Lloyd, K. G., Cordero, R. J. B., de Campos, C. B. L., Yakimov, M. M., Amis, R.	Scientific novelty beyond the experiment	Microb Biotechnol	2023						10.1111/1751-7915.14222	
M. Hayakawa, Watanabe, O., Shiga, K., Fujishita, M., Yamaki, C., Ogo, Y., Takahashi, T., Ikeguchi, Y., Takayama, T.	Exploring types of conversational agents for resolving cancer patients' questions and concerns: Analysis of 100 telephone consultations on breast cancer	Patient Educ Couns	2023	106		75-84		Humans, Female, "Referral and Consultation," "Breast Neoplasms, Telephone, Communication, Breast neoplasms, Chatbots, Conversational agent, Medical Informatics, Patient navigation, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	10.1016/j.pec.2022.10.004	
K. F. Hew, Huang, W., Du, J., Jia, C.	Using chatbots to support student goal setting and social presence in fully online activities: learner engagement and perceptions	J Comput High Educ	2023	35	1	40-68		Chatbot, Goal-setting, Higher education, Online learning, Social presence	10.1007/s12528-022-09338-x	
M. T. Ho, Le, N. T. B., Mantello, P., Ho, M. T., Ghotbi, N.	Understanding the acceptance of emotional artificial intelligence in Japanese healthcare system: A cross-sectional survey of clinic visitors' attitude	Technology in Society	2023	72				AI in Healthcare, Artificial intelligence (AI), Emotional AI (EAI), Japan, Japanese elderly patients, Behavioral research, Deep learning, Engineering education, Health care, Hospitals, Learning systems, Linear regression, Aging population, Artificial intelligence, Artificial intelligence in healthcare, Artificial intelligence technologies, Cross-sectional surveys, Emotional artificial intelligence, Healthcare systems, Healthcare workers, Japanese elderly patient, Diagnosis, elderly care, machine learning, mental health, software	10.1016/j.techsoc.2022.102166	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85143489900&doi=10.1016/j.techsoc.2022.102166&partnerID=40&md5=000698803f88b1f691f33947ef2efae5
A. Holzinger, Keibinger, K., Hobu, P., Zaitouk, K., M�ller, H.	AI for life: Trends in artificial intelligence for biotechnology	N Biotechnol	2023	74		16-24		Artificial Intelligence, Biotechnology, Deep Learning, Digital Transformation, Machine Learning, of interests.	10.1016/j.nbt.2023.02.001	
J. Hsu	Should schools ban AI chatbots?	NEW SCIENTIST	2023	246	3422	15-15				
T. C. Hsu, Huang, H. L., Hwang, G. J., Chen, M. S.	Effects of Incorporating an Expert Decision-making Mechanism into Chatbots on Students' Achievement, Enjoyment, and Anxiety	EDUCATIONAL TECHNOLOGY & SOCIETY	2023	26	1	218-231		Artificial Intelligence in Education, Expert knowledge, Decision tree, Chatbot, Interactive learning system, ARTIFICIAL INTELLIGENCE, PRECISION EDUCATION, LEARNING ANALYTICS, AI, SYSTEM, PERSPECTIVES, SKILLS, MAP	10.30191/ETS.202301_26(1).0016	

J. Huang, Yeung, A. M., Kerr, D., Klonoff, D. C.	Using ChatGPT To Predict the Future of Diabetes Technology	J Diabetes Sci Technol	2023			1,9E+16	artificial intelligence, chatbot, diabetes, diabetes technology, search		10.1177/19322968231161095	
S. Huh	Are ChatGPT's knowledge and interpretation ability comparable to those of medical students in Korea for taking a parasitology examination? A descriptive study	J Educ Eval Health Prof	2023	20		1	Humans, Educational Measurement/methods, Knowledge, Republic of Korea, "Students, Medical, Artificial Intelligence, Educational measurement, Medical students, Republic of Korea, Evaluation for Health Professions since 2005. He was not involved in the review, process. Otherwise, no potential conflict of interest relevant to this article, was reported.	This study aimed to compare the knowledge and interpretation ability of ChatGPT, a language model of artificial general intelligence, with those of medical students in Korea by administering a parasitology examination to both ChatGPT and medical students. The examination consisted of 79 items and was administered to ChatGPT on January 1, 2023. The examination results were analyzed in terms of ChatGPT's overall performance score, its correct answer rate by the items' knowledge level, and the acceptability of its explanations of the items. ChatGPT's performance was lower than that of the medical students, and ChatGPT's correct answer rate was not related to the items' knowledge level. However, there was a relationship between acceptable explanations and correct answers. In conclusion, ChatGPT's knowledge and interpretation ability for this parasitology examination were not yet comparable to those of medical students in Korea.	10.3352/jeeph.2023.20.1	
S. Huh	Issues in the 3rd year of the COVID-19 pandemic, including computer-based testing, study design, ChatGPT, journal metrics, and appreciation to reviewers	J Educ Eval Health Prof	2023	20		5	Humans, "covid-19, Pandemics, Benchmarking, SARS-CoV-2, Peer Review, Research		10.3352/jeeph.2023.20.5	
M. H. Hwang, Shin, J., Seo, H., Im, J. S., Cho, H., Lee, C. K.	Ensemble-NQG-TS: Ensemble Neural Question Generation Model Based on Text-to-Text Transfer Transformer	Applied Sciences (Switzerland)	2023	13	2		deep learning, ensemble algorithms, natural language processing, neural question generation	Deep learning chatbot research and development is exploding recently to offer customers in numerous industries personalized services. However, human resources are used to create a learning dataset for a deep learning chatbot. In order to augment this, the idea of neural question generation (NQG) has evolved, although it has restrictions on how questions can be expressed in different ways and has a finite capacity for question generation. In this paper, we propose an ensemble-type NQG model based on the text-to-text transfer transformer (T5). Through the proposed model, the number of generated questions for each single NQG model can be greatly increased by considering the mutual similarity and the quality of the questions using the soft-voting method. For the training of the soft-voting algorithm, the evaluation score and mutual similarity score weights based on the context and the question-answer (QA) dataset are used as the threshold weight. Performance comparison results with existing T5-based NQG models using the SQuAD 2.0 dataset demonstrate the effectiveness of the proposed method for QG. The implementation of the proposed ensemble model is anticipated to span diverse industrial fields, including interactive chatbots, robotic process automation (RPA), and Internet of Things (IoT) services in the future. © 2023 by the authors.	10.3390/app13020903	https://www.scopus.com/inward/record.uri?eid=2-12-D-85146679723&doi=10.3390%2Fapp13020903&partnerID=40&md5=f17afbf6d77bd909c9cb0269a28f6c55
I. Iancu, B.	Interacting with chatbots later in life: A technology acceptance perspective in COVID-19 pandemic situation	Frontiers in Psychology	2023	13			behavioral intention, chatbots, middle-aged and aging adults, perceived ease of use, perceived usefulness, technology acceptance model	Introduction: Within the technological development path, chatbots are considered an important tool for economic and social entities to become more efficient and to develop customer-centric experiences that mimic human behavior. Although artificial intelligence is increasingly used, there is a lack of empirical studies that aim to understand consumers' experience with chatbots. Moreover, in a context characterized by constant population aging and an increased life-expectancy, the way aging adults perceive technology becomes of great interest. However, based on the digital divide (unequal access to technology, knowledge, and resources), and since young adults (aged between 18 and 34 years old) are considered to have greater affinity for technology, most of the research is dedicated to their perception. The present paper investigates the way chatbots are perceived by middle-aged and aging adults in Romania. Methods: An online opinion survey has been conducted. The age-range of the subjects is 40–78 years old, a convenience sampling technique being used (N = 235). The timeframe of the study is May–June 2021. Thus, the COVID-19 pandemic is the core context of the research. A covariance-based structural equation modeling (CB-SEM) has been used to test the theoretical assumptions as it is a procedure used for complex conceptual models and theory testing. Results: The results show that while perceived ease of use is explained by the effort, the competence, and the perceive external control in interacting with chatbots, perceived usefulness is supported by the perceived ease of use and subjective norms. Furthermore, individuals are likely to further use chatbots (behavioral intention) if they consider this interaction useful and if the others' opinion is in favor of using it. Gender and age seem to have no effect on behavioral intention. As studies on chatbots and aging adults are few and are mainly investigating reactions in the healthcare domain, this research is one of the first attempts to better understand the way chatbots in a not domain-specific context are perceived later in life. Likewise, judging from a business perspective, the results can help economic and social organizations to improve and adapt AI-based interaction for the aging customers. Copyright © 2023 Iancu and Iancu.	10.3389/fpsyg.2022.1111003	https://www.scopus.com/inward/record.uri?eid=2-12-D-851447144674&doi=10.3389%2Fpsyg.2022.1111003&partnerID=40&md5=6f50b58d2a27f19509d53b1d05972aa0
J. Jasin, Ng, H. T., Atmoukarto, J. I., Iyer, P., Osman, F., Wong, P. Y., K., Pua, C. Y., Cheow, W. S.	The implementation of chatbot-mediated immediacy for synchronous communication in an online chemistry course	Educ Inf Technol (Dordr)	2023			Jan 26	Chatbot, Chemistry, Immediacy, Online Classes, Scaffolding, Synchronous Communication, relevant to the content of this article.	Low student engagement and motivation in online classes are well-known issues many universities face, especially with distance education during the COVID-19 pandemic. The online environment makes it even harder for teachers to connect with their students through traditional verbal and nonverbal behaviours, further decreasing engagement. Yet, addressing such problems with 24/7 synchronous communication is overly demanding for faculty. This paper details an automated Question-Answering chatbot system trained in synchronous communication and instructor immediacy techniques to determine its suitability and effectiveness in attending to students undergoing an online Chemistry course. The chatbot is part of a new wave of effective focused chatbots that can benefit students' learning process by connecting with them on a relatively more humanlike level. As part of the pilot study in the development of this chatbot, qualitative interviews and self-report data capturing student-chatbot interactions, experiences and opinions have been collected from 12 students in a Singaporean university. Thematic analysis was then employed to consolidate these findings. The results support the chatbot's ability to display several communication immediacy techniques well, on top of responding to students at any time of the day. Having a private conversation with the chatbot also meant that the students could fully focus their attention and ask more questions to aid their learning. Improvements were suggested, in relation to the chatbot's word detection and accuracy, accompanied by a framework to develop communication immediacy mechanics in future chatbots. Our findings support the potential of this chatbot, once modified, to be used in a similar online setting. SUPPLEMENTARY INFORMATION: The online version contains supplementary material available at 10.1007/s10639-023-11602-1.	10.1007/s10639-023-11602-1	
Y. Jiang, Yang, X., Zheng, T.	Make chatbots more adaptive: Dual pathways linking human-like cues and tailored response to trust in interactions with chatbots	Computers in Human Behavior	2023	138			Ambiguity tolerance, Chatbot, Human-like cues, Tailored response, Task-technology fit, Trust, AI applications, Ambiguity tolerances, Chatbots, Human like, Human like cue, Research models, Social presence, Task technology fit	As one of the most popular AI applications, chatbots are creating new ways and value for businesses to interact with their customers, and their adoption and continued use will depend on users' trust. However, due to the non-transparent of AI-related technology and the ambiguity of application boundaries, it is difficult to determine which aspects enhance the adaptation of chatbots and how they interactively affect human trust. Based on the theory of task-technology fit, we developed a research model to investigate how two conversational cues of chatbots, human-like cues and tailored responses, influence human trust toward chatbots and to explore appropriate boundary conditions (individual characteristics and task characteristics) in interacting with chatbots. One survey and two experiments were performed to test the research model, and the results indicated that (1) perceived task solving competence and social presence mediate the pathway from conversational cues to human trust, which was validated in the context of e-commerce and education; (2) the extent of users' ambiguity tolerance moderates the effects of two conversational cues on social presence; and (3) when performing high-creative tasks, the human-like chatbot induces higher perceived task solving competence. Our findings not only contribute to the AI trust-related literature but also provide practical implications for the development of chatbots and their assignment to individuals and tasks. © 2022 Elsevier Ltd	10.1016/j.chb.2022.107485	https://www.scopus.com/inward/record.uri?eid=2-12-D-85139266683&doi=10.1016%2Fchb.2022.107485&partnerID=40&md5=a434ea857b9fa7289c218abb96193d3d
Y. Jiang, Yang, X. C., Zheng, T. Q.	Make chatbots more adaptive: Dual pathways linking human-like cues and tailored response to trust in interactions with chatbots	COMPUTERS IN HUMAN BEHAVIOR	2023	138			Chatbot, Trust, Human-like cues, Task-technology fit, Ambiguity tolerance, Tailored response, TASK-TECHNOLOGY FIT, ARTIFICIAL-INTELLIGENCE, INTEGRATIVE MODEL, SOCIAL PRESENCE, INFORMATION, SYSTEMS, AMBIGUITY, UNCERTAINTY, PERCEPTIONS, PERSPECTIVE	As one of the most popular AI applications, chatbots are creating new ways and value for businesses to interact with their customers, and their adoption and continued use will depend on users' trust. However, due to the non-transparent of AI-related technology and the ambiguity of application boundaries, it is difficult to determine which aspects enhance the adaptation of chatbots and how they interactively affect human trust. Based on the theory of task-technology fit, we developed a research model to investigate how two conversational cues of chatbots, human-like cues and tailored responses, influence human trust toward chatbots and to explore appropriate boundary conditions (individual characteristics and task characteristics) in interacting with chat-bots. One survey and two experiments were performed to test the research model, and the results indicated that (1) perceived task solving competence and social presence mediate the pathway from conversational cues to human trust, which was validated in the context of e-commerce and education; (2) the extent of users' ambiguity tolerance moderates the effects of two conversational cues on social presence; and (3) when performing high-creative tasks, the human-like chatbot induces higher perceived task solving competence. Our findings not only contribute to the AI trust-related literature but also provide practical implications for the development of chatbots and their assignment to individuals and tasks.	10.1016/j.chb.2022.107485	
R. Karra, Lasfar, A.	Impact of Data Quality on Question Answering System Performances	INTELLIGENT AUTOMATION AND SOFT COMPUTING	2023	35	1	335-349	DataOps, data quality, QA system, nlp, context simplification, SIMPLIFICATION	In contrast with the research of new models, little attention has been paid to the impact of low or high-quality data feeding a dialogue system. The present paper makes the first attempt to fill this gap by extending our previous work on question-answering (QA) systems by investigating the effect of misspelling on QA agents and how context changes can enhance the responses. Instead of using large language models trained on huge datasets, we propose a method that enhances the model's score by modifying only the quality and structure of the data feed to the model. It is important to identify the features that modify the agent performance because a high rate of wrong answers can make the students lose their interest in using the QA agent as an additional tool for distant learning. The results demonstrate the accuracy of the proposed context simplification exceeds 85%. These findings shed light on the importance of question data quality and context complexity construct as key dimensions of the QA system. In conclusion, the experimental results on questions and contexts showed that controlling and improving the various aspects of data quality around the QA system can significantly enhance its robustness and performance.	10.32604/isc.2023.026695	
V. Kaushal, Yadav, R.	Learning successful implementation of Chatbots in businesses from B2B customer experience perspective	Concurrency and Computation: Practice and Experience	2023	35	1		Chatbots, content analysis, customer experience, customization, integration, Natural language processing systems, Customisation, Exploratory studies, Research gaps, Service interfaces, Social interactions, Turn-around time, Two phase, Sales	Artificial intelligence empowered Chatbots are altering the nature of service interfaces which has further resulted in raised expectations from Chatbots to understand customer's social interactions and respond them within the turnaround time. To close this research gap, we conduct an exploratory study in two phases-industry's perspective and B2B customer's perspective and analyze results with the help of NVIVO 12 plus and Leximancer. The findings reveal perceived risk with respect to Chatbots is high, complex pricing structure along with nonavailability of testing options makes the pre purchase more complex. Moreover, interactive speed, customization especially with respect to language issues, integration with other platforms is some of the major themes which influence customer experience. Advancements in AI, natural language processing and more testing at all phases will bring efficiency, automation first strategies. Further, our findings suggest Chatbots must provide more personalization, scalability and omni channel engagement and focus on delivering more enhanced customer experience. Chatbots must offer a grievance management dashboard where the customer can see live queries, resolved queries, present queries status and so on to get transparency. Chatbots streamline the lead qualification process, greatly improve, and speed up the data collection therefore, enhancing customer experience. © 2022 John Wiley & Sons, Ltd.	10.1002/cpe.7450	https://www.scopus.com/inward/record.uri?eid=2-12-D-85141380012&doi=10.1002%2Fcpe.7450&partnerID=40&md5=f61d69145ee4ab08804e0548a7074d2e

P. Kaywan, Ahmed, K., Ibadia, Y., Gu, B.	Early detection of depression using a conversational AI bot: A non-clinical trial	PLoS One	2023	18	2 e0279743	Humans, Male, Adult, Adolescent, Young Adult, Middle Aged, Aged, Aged, 80 and over, Female, "Depression/diagnosis, "Depressive Disorder, Major/psychology, Artificial Intelligence, Surveys and Questionnaires, Focus Groups	BACKGROUND: Artificial intelligence (AI) has gained momentum in behavioural health interventions in recent years. However, a limited number of studies use or apply such methodologies in the early detection of depression. A large population needing psychological-intervention is left unidentified due to barriers such as cost, location, stigma and a global shortage of health workers. Therefore, it is essential to develop a mass screening integrative approach that can identify people with depression at its early stage to avoid a potential crisis. OBJECTIVES: This study aims to understand the feasibility and efficacy of using AI-enabled chatbots in the early detection of depression. METHODS: We use Dialogflow as a conversation interface to build a Depression Analysis (DEPRA) chatbot. A structured and authoritative early detection depression interview guide, which contains 27 questions combining the structured interview guide for the Hamilton Depression Scale (SGH-D) and the inventory of depressive symptomatology (IDS-C), underpins the design of the conversation flow. To attain better accuracy and a wide variety of responses, we train Dialogflow with the utterances collected from a focus group of 10 people. The occupation of the focus group members included academics and HDR candidates who are conscious, vigilant and have a clear understanding of the questions. In addition, DEPRA is integrated with a social media platform to provide practical access to all the participants. For the non-clinical trial, we recruited 50 participants aged between 18 and 80 from across Australia. To evaluate the practicability and performance of DEPRA, we also asked participants to submit a user satisfaction survey at the end of the conversation. RESULTS: A sample of 50 participants, with an average age of 34.7 years, completed this non-clinical trial. More than half of the participants (54%) are male and the major ethnicities are Asian (63%), Middle Eastern (25%), and others 12%. The first group comprises professional academic staff and HDR candidates, the second and third groups comprise relatives, friends, and volunteers who were recruited via social media promotions. DEPRA uses two scientific scoring systems, QIDS-SR and IDS-SR to verify the results of early depression detection. As the results indicate, both scoring systems return a similar outcome with slight variations for different depression levels. According to IDS-SR, 30% of participants were healthy, 14% mild, 22% moderate, 14% severe, and 20% very severe. QIDS-SR suggests 32% were healthy, 18% mild, 10% moderate, 18% severe, and 22% very severe. Furthermore, the overall satisfaction rate of using DEPRA was 79% indicating that the participants had a high rate of user satisfaction and engagement. CONCLUSION: DEPRA shows promise as a feasible option for developing a mass screening integrated approach for early detection of depression. Although the chatbot is not intended to replace the functionality of mental health professionals, it does show promise as a means of assisting with automation and concealed communication with verified scoring systems.	10.1371/journal.pone.0279743	
C. Eecht, Egger, A., Kratsch, W., Röglinger, M.	Quantifying chatbots' ability to learn business processes	Information Systems	2023	113		Chatbots, Conformance checking, Natural language processing, Process mining, Data mining, Natural language processing systems, Business Process, Business to customers, Language processing, Learn, Natural languages, User input, Sales	Chatbots enable organizations in the business-to-customer domain to respond to repetitive requests efficiently. Extant approaches in Natural Language Processing (NLP) already address the essential requirement of understanding user input and synthesizing a response as close as possible to a response a human interlocutor would give. However, we argue that the organizational adoption of chatbots further depends on the underlying model's capability to learn and comply with organizations' business processes, for example, authenticating a customer before providing sensitive details. To address this issue, we develop an approach that quantifies chatbots' ability to learn business processes using standardized process mining metrics. We demonstrate our approach by training chatbots on a dataset of more than 500,000 customer service conversations from three companies on Twitter and show how our approach supports the quantification of a chatbot's overall ability to learn business processes from the training data. Furthermore, we quantify a chatbot's ability to learn a particular variant of the underlying process and we show how to compare the chatbot's executed steps against a given normative process model. Our approach that seamlessly integrates with existing approaches to evaluate NLP-based chatbots mitigates the current hurdles that practitioners face and, therefore, strives to foster the adoption of chatbots in practice. © 2023 Elsevier Ltd	10.1016/j.is.2023.102176	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146901275&doi=10.1016%2Fj.is.2023.102176&partnerID=40&md5=842ec824169b7355f6d85a20117036
D. Khurana, Koli, A., Khatter, K., Singh, S.	Natural language processing: state of the art, current trends and challenges	Multimed Tools Appl	2023	82	3 3713-3744	NLP applications, NLP evaluation metrics, Natural language generation, Natural language processing, Natural language understanding, supervision of Dr. Kiran Khatter and Dr. Sukhdev Singh, associated with CL-, Educate: Accendere Knowledge Management Services Pvt. Ltd. and deputed at the, Manav Rachna International University. The draft is also available on arxiv.org. at https://arxiv.org/abs/1708.05148	Natural language processing (NLP) has recently gained much attention for representing and analyzing human language computationally. It has spread its applications in various fields such as machine translation, email spam detection, information extraction, summarization, medical, and question answering etc. In this paper, we first distinguish four phases by discussing different levels of NLP and components of Natural Language Generation followed by presenting the history and evolution of NLP. We then discuss in detail the state of the art presenting the various applications of NLP, current trends, and challenges. Finally, we present a discussion on some available datasets, models, and evaluation metrics in NLP.	10.1007/s11042-022-13428-4	
D. Kim, Jang, J.T., Kim, C., Kim, H. W., Hong, E., Ban, S., Shin, M., Lee, H. D., Lee, H. D., Mo, H. S., Woo, J., Kim, D. H.	Read Disturbances in Cross-Point Phase-Change Memory Arrays - Part I: Physical Modeling with Phase-Change Dynamics	IEEE Transactions on Electron Devices	2023	70	2 514-520	Phase-change memory (PCM), Read disturbance, selector, storage-class memory (SCM), Dynamics, Phase change materials, Chatbots, Cross point, Phase-change memory, Read current, Resistance, Storage-class memory, Storage-class memory, Phase change memory	Phase-change memory (PCM) connected to an additional selector has been implemented in cross-point arrays for storage class memory applications. In the one-PCM and one-selector (1S-1) configuration, the selector should be turned on first to read the resistance state of the PCM. This requires a large read voltage (V _{read}), and a high read current from the PCM is instantly produced, which causes read disturbances. To understand the underlying mechanism of the disturbance, in this study, we developed a physics-based Verilog-A model to describe the measured electrical behavior of the 1S-1R cell in HSPICE by considering thermally induced crystallization and melting dynamics. Based on V _{TH} , which is the voltage induced when the selector is on, the crystalline and amorphous phases of the PCM can be identified indirectly. Based on the measured data, when the pristine amorphous state of the PCM is programmed by a higher SET current (I _{SET}), V _{TH} decreases owing to enhanced crystallization, leading to a low-resistance state. However, V _{TH} subsequently begins to increase with respect to I _{SET} , which results in a U-shaped V _{TH} -I _{SET} curve. It is inferred that melting is preferred at temperatures above 900 K induced by the high-read current. The V _{TH} increase induced by the amorphization can be explained by transient simulations. The simulation results are in good agreement with the experimental data and reveal that the temperature generated from the 1S-1R cell plays an important role in triggering the unwanted phase transition of the GeS ₂ Te layer during the read operation. © 1963-2012 IEEE.	10.1109/TED.2022.3231818	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146221643&doi=10.1109%2Fted.2022.3231818&partnerID=40&md5=916b743f6e16eedb6448b603dde9375
J. Kim, Im, I.	Anthropomorphic response: Understanding interactions between humans and artificial intelligence agents	Computers in Human Behavior	2023	139		Anthropomorphic response, Anthropomorphism, Artificial intelligence, Human and nonhuman interaction, Perceived cognitive intelligence, Perceived emotional intelligence, Intelligent agents, Artificial intelligence agent, Chatbots, Cognitive intelligence, Emotional intelligence, User form, Behavioral research	This study of anthropomorphic response to artificial intelligence begins with an extensive review of the literature and an identification of conceptual distinctions between anthropomorphism and anthropomorphic response. The authors develop an instrument for measuring how users form anthropomorphic response to interactions with AI chatbots. Amazon MTurk is used to recruit 120 users for a pilot study and 393 users for the main study. Participants respond to six scenarios depicting interactions between humans and artificial intelligence. Results show that anthropomorphism depends on perceptions of agent appearance, cognitive intelligence, and emotional intelligence. Users perceive more humanness in highly intelligent but disembodied agents rather than in highly intelligent agents that have poorly designed appearances. And users who have strong tendencies to anthropomorphize non-sentient entities are less likely to form anthropomorphic response when interacting with agents with high cognitive intelligence. The study enhances understandings about human/AI interactions. It provides directions for future research regarding anthropomorphic response and provide directions for future research on designing and using artificial agents. © 2022 Elsevier Ltd	10.1016/j.chb.2022.107512	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140235056&doi=10.1016%2Fj.chb.2022.107512&partnerID=40&md5=acb729c033636721da2b2fed8cd513a6
Y. Kim, Kim, J. H., Kim, Y. M., Song, S., Joo, H. J.	Predicting medical specialty from text based on a domain-specific pre-trained BERT	Int J Med Inform	2023	170	104956	Humans, Artificial Intelligence, "Covid-19, "Medicine, Adaptation, Psychological, Cognition, Natural Language Processing, Bidirectional encoder representations from transformers, Deep learning, Medical question-and-answer post, Medical specialty prediction, Natural language processing, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	BACKGROUND: Owing to the prevalence of the coronavirus disease (COVID-19), coping with clinical issues at the individual level has become important to the healthcare system. Accordingly, precise initiation of treatment after a hospital visit is required for expedited processes and effective diagnoses of outpatients. To achieve this, artificial intelligence in medical natural language processing (NLP), such as a healthcare chatbot or a clinical decision support system, can be suitable tools for an advanced clinical system. Furthermore, support for decisions on the medical specialty from the initial visit can be helpful. MATERIALS AND METHODS: In this study, we propose a medical specialty prediction model from patient-side medical question text based on pre-trained bidirectional encoder representations from transformers (BERT). The dataset comprised pairs of medical question texts and labeled specialties scraped from a website for the medical question-and-answer service. The model was fine-tuned for predicting the required medical specialty labels among 27 labels from medical question texts. To demonstrate the feasibility, we conducted experiments on a real-world dataset and elaborately evaluated the predictive performance compared with four deep learning NLP models through cross-validation and test set evaluation. RESULTS: The proposed model showed improved performance compared with competitive models in terms of overall specialties. In addition, we demonstrate the usefulness of the proposed model by performing case studies for visualization applications. CONCLUSION: The proposed model can benefit hospital patient management and reasonable recommendations for specialties for patients.	10.1016/j.ijmedinf.2022.104956	
Y. Kim, Kim, J. H., Kim, Y. M., Song, S. H., Joo, H. J.	Predicting medical specialty from text based on a domain-specific pre-trained BERT	INTERNATIONAL JOURNAL OF MEDICAL INFORMATICS	2023	170		Bidirectional encoder representations from transformers, Deep learning, Medical specialty prediction, Medical question -and - answer post, Natural language processing	Background: Owing to the prevalence of the coronavirus disease (COVID-19), coping with clinical issues at the individual level has become important to the healthcare system. Accordingly, precise initiation of treatment after a hospital visit is required for expedited processes and effective diagnoses of outpatients. To achieve this, artificial intelligence in medical natural language processing (NLP), such as a healthcare chatbot or a clinical decision support system, can be suitable tools for an advanced clinical system. Furthermore, support for decisions on the medical specialty from the initial visit can be helpful. Materials and methods: In this study, we propose a medical specialty prediction model from patient-side medical question text based on pre-trained bidirectional encoder representations from transformers (BERT). The dataset comprised pairs of medical question texts and labeled specialties scraped from a website for the medical question-and-answer service. The model was fine-tuned for predicting the required medical specialty labels among 27 labels from medical question texts. To demonstrate the feasibility, we conducted experiments on a real-world dataset and elaborately evaluated the predictive performance compared with four deep learning NLP models through cross-validation and test set evaluation. Results: The proposed model showed improved performance compared with competitive models in terms of overall specialties. In addition, we demonstrate the usefulness of the proposed model by performing case studies for visualization applications. Conclusion: The proposed model can benefit hospital patient management and reasonable recommendations for specialties for patients.	10.1016/j.ijmedinf.2022.104956	
M. R. King	The Future of AI in Medicine: A Perspective from a Chatbot	Ann Biomed Eng	2023	51	2 291-295	"Software, "Artificial Intelligence		10.1007/s10439-022-03121-w	
M. R. King	A Conversation on Artificial Intelligence, Chatbots, and Plagiarism in Higher Education	Cell Mol Bioeng	2023	16	1 01. Feb			10.1007/s12195-022-00754-8	
M. R. King, chatGpt,	A Conversation on Artificial Intelligence, Chatbots, and Plagiarism in Higher Education	Cellular and Molecular Bioengineering	2023	16	1 01. Feb	artificial intelligence, college student, Editorial, health care, human, plagiarism, tertiary education		10.1007/s12195-022-00754-8	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145459142&doi=10.1007%2Fs12195-022-00754-8&partnerID=40&md5=107ed0ab9241ced10559e1ec23c1d48
F. C. Kitamura	ChatGPT Is Shaping the Future of Medical Writing but Still Requires Human Judgment	Radiology	2023		230171			10.1148/radiol.230171	

K. Kittipimpano, N. Noydom, A., Panjatharaku I. P., Vituditban, P. J.	Use of and Satisfaction With Mobile Health Education During the COVID-19 Pandemic in Thailand: Cross-sectional Study	JMIR Form Res	2023	7	e43639	Covid-19, chatbot, mHealth, satisfaction, use	BACKGROUND: RamaCovid is a mobile health (mHealth) education system that provides the Thai population with information about COVID-19 and self-risk assessment. RamaCovid has a chatbot system that provides automatic conversations (available 24 hours per day) and a live chat function that allows users to directly communicate with health professionals (available 4 hours per day in the evening). The system consists of (1) COVID-19 vaccine information, (2) self-care after vaccination, (3) frequently asked questions, (4) self-risk assessment, (5) hospital finding, (6) contact number finding, and (7) live chat with a health professional. OBJECTIVE: This study investigates the use of and satisfaction with the RamaCovid system. METHODS: Overall, 400 people were recruited via RamaCovid by broadcasting an infographic about the study. Questionnaires collected demographic data, users' experiences of RamaCovid, and the use of and satisfaction with the system. The questions were answered using a 5-point Likert scale. Descriptive statistics were used to describe the participant characteristics and their use of and satisfaction with the RamaCovid system. The Mann-Whitney U test was performed to examine the difference in use and satisfaction between the adult and older adult groups. RESULTS: The participants showed high use of and satisfaction with the RamaCovid system. They used the information to take care of themselves and their family, and they gained information about their COVID-19 risk. The users were satisfied with the system because the information was easy to understand, trustworthy, and up to date. However, the older adult group had lower use of and satisfaction with the system compared to the adult group. CONCLUSIONS: RamaCovid is an example of the successful implementation of mHealth education. It was an alternative way to work with the call center during the COVID-19 pandemic and increased access to health information and health care services. Providing ongoing updated information, improving the attractiveness of the media information, and the age group difference are important issues for further system development.	10.2196/43639	
E. Klang, Levy Mendelovich, S.	Evaluation of OpenAI's large language model as a new tool for writing papers in the field of thrombosis and hemostasis	J Thromb Haemost	2023					10.1016/j.jtha.2023.01.011	
E. F. Kleinau, Lamba, T., Jaskiewicz, W., Gorenitz, K., Hungerbuehl, er, I., Rahimi, D., Kokota, D., Mallich, L., Jamu, E. S., Zumazuma, A., Mota, R., Khouri, Y., Kapps, M.	Effectiveness of a chatbot in improving the mental wellbeing of health workers in Malawi during the COVID-19 pandemic: A randomized, controlled trial		2023		(kleinau E.F., kleinau@urc-ichu.com) Global-Latin America and Caribbean (LAC)-West Africa Region, University Research Co. (URC), Chevy Chase, MD, United States	adult, anxiety, burnout, chatbot, clinical assessment, comparative effectiveness, controlled study, coronavirus disease 2019, depression, effect size, female, health care facility, health care personnel, human, internet, loneliness, major clinical study, Malawi, male, mental health, mental health care personnel, outcome assessment, pandemic, Patient Health Questionnaire 9, psychological well-being, randomized controlled trial, risk assessment, wellbeing	After the deleterious effects of the COVID-19 pandemic on healthcare worker mental health, we tested the effectiveness of an interactive chatbot, Vitalik, for improving wellbeing and resilience among healthcare workers in Malawi, a country with few mental health professionals. We conducted a randomized, controlled trial (RCT) to investigate our hypothesis that Vitalik is more effective in improving mental health and resilience outcomes than passive internet resources. For our 2-arm, 8-week, parallel RCT (ISRCTN13578480), we recruited participants from 8 professional cadres from public and private healthcare facilities. The treatment arm used Vitalik; the control arm received links to internet resources. Of 1,584 participants, 512 completed baseline and endline assessments. Six assessments provided outcome measures for: anxiety (GAD-7); depression (PHQ-9); burnout (OLBI); loneliness (ULCA); resilience (RS-14); and resilience-building activities. We analyzed effectiveness using mixed-effects linear models, effect size estimates, and reliable change in risk levels. Results from mixed-model analyses support our hypothesis. Difference-in-differences estimators showed that Vitalik reduced: depression [-0.68 (95% CI -1.15 to -0.21)]; anxiety [-0.44 (95% CI -0.88 to 0.01)]; and burnout [-0.58 (95% CI -1.32 to 0.15)]. Changes in resilience (1.47 [95% CI 0.05 to 2.88]) and resilience-building activities (1.22 [95% CI 0.56 to 1.87]) were significantly greater in the treatment group. We observed no treatment effect on loneliness. Our RCT produced a medium effect size. This is the first RCT of a mental health app for healthcare workers during the pandemic in Southern Africa combining multiple mental wellbeing outcomes, and measuring resilience and resilience-building activities. A significant number of participants could have benefited from mental health support (1 in 8 reported anxiety and depression; 3 in 4 suffered burnout; and 1 in 4 had low resilience). Such help is not readily available in Malawi. Vitalik has the potential to fill this gap.	10.1101/2023.01.24.23284959	https://www.embase.com/search/results?subaction=viewrecord&id=t20225484408&from=export,http://dx.doi.org/10.1101/2023.01.24.23284959
B. Klimova, Pihlart, M., Polakova, P., Cerna, M., Yavligan, S. Y., Slusik, S.	A Systematic Review on the Use of Emerging Technologies in Teaching English as an Applied Language at the University Level	Systems	2023	11	1	AI, applied language, chatbots, English as a foreign language, foreign language education, mobile apps, practical implications, university	At present, emerging technologies, such as machine learning, deep learning, or various forms of artificial intelligence are penetrating different fields of education, including foreign language education (FLE). Moreover, the current young generation was born into the technological environment, and they perceive technologies as being an indispensable part of their everyday life. However, they mainly use technologies in their informal learning, but there is not much research into emerging technologies in FLE, namely in teaching and learning English as an applied language. Therefore, the purpose of this systematic review is to identify, bring together, compare and analyse all of the technologies that are currently efficiently employed in foreign language teaching and learning, and based on the findings of the detected experimental studies, we provide specific pedagogical implications on how to use these technologies in the acquisition of English as an applied language at the university level. The methodology followed the PRISMA guidelines for systematic reviews and meta-analyses. The results of the detected experimental studies revealed that there was a serious lack of the latest technologies, such as chatbots or virtual reality (VR) devices, that are being empirically employed in a foreign language (FL) education. Moreover, mobile apps are merely focused on the development of FL vocabulary. The findings also indicate that although the FL teachers might theoretically know about these latest technological devices, such as neural machine translation, they do not know how to practically implement them in their teaching process. Therefore, this research suggests that teachers must be trained and pedagogically guided on how to purposefully implement them in their FL classes to support traditional instruction in order to identify what skills or language structures could be developed through their use. In addition, it is also claimed that more experimental studies are needed to clearly the evidence and its usefulness in teaching a foreign language as an applied language. © 2023 by the authors.	10.3390/systems11010042	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146743296&doi=10.3390/2systems11010042&partnerID=40&md5=8f602738c17f9241177bcb229595966
L. Kohne	L2 learners' perceptions of a chatbot as a potential independent language learning tool	INTERNATIONAL JOURNAL OF MOBILE LEARNING AND ORGANISATION	2023	17	01 Feb 214-226	chatbots, L2, EAP, tertiary education, independent language learning, language learning, dialogflow, FUTURE, ELIZA, BOTS	Independent language learning is paramount for those wishing to develop proficiency in a second or foreign language. Language learners often have few opportunities to communicate and interact actively in their target language. In this two-phase study, a chatbot was developed to assist second language learners at a tertiary education institution in Hong Kong with independent language learning. I employed a questionnaire (N = 128) followed by semi-structured interviews (N = 12) to gain holistic insight into learners' experiences with the chatbot. The results suggested that the participants enjoyed interacting with the chatbot both in and out of class and perceived that it improved their English skills. These findings have implications for language teachers and the future development of chatbots.	10.1504/IJMO.2023.128339	
E. Konya-Baumbach, Biller, M., von Janda, S.	Someone out there? A study on the social presence of anthropomorphized chatbots	Computers in Human Behavior	2023		139	Anthropomorphism, Chatbots, Hedonic, Sensitive Information, Social presence, Utilitarian, Behavioral research, Human computer interaction, Cost-efficient, Human like, Purchase intention, Sensitive information, Time-efficient, Sales	Companies are increasingly employing text-based chatbots as a time and cost-efficient way to interact with customers. While companies begin to explore anthropomorphic chatbot designs by imbuing chatbots with human-like characteristics, the effectiveness of chatbot anthropomorphism remains unclear. We conducted three experiments to assess the effectiveness of chatbot anthropomorphism in customer-chatbot interactions. By equipping chatbots with human-like linguistic cues, we evoke different levels of chatbot anthropomorphism. Our results show significant positive effects of chatbot anthropomorphism on trust, purchase intention, word of mouth, and satisfaction with the shopping experience. More importantly, we identify social presence as the underlying mediating mechanism of these effects. These effects are robust and not contingent on different shopping contexts distinguished by hedonic versus utilitarian shopping motivations or the disclosure of (non-)sensitive information by customers. The present research derives managerial implications for companies that seek to effectively employ chatbots in customer interactions. Further, this study advances research on customers' reactions towards anthropomorphized chatbots and demonstrates that social presence is a critical driver of successful customer-chatbot interactions. © 2022 Elsevier Ltd	10.1016/j.chb.2022.107513	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139738533&doi=10.1016/j.chb.2022.107513&partnerID=40&md5=307c3c355baf1a2d52b46ed0bdf85953
C. Krettek	[ChatGPT : Milestone text AI with game changing potential]	Unfallchirurgie (Heideb)	2023					10.1007/s00113-023-01296-y	
M. A. Kuhlai, Alkurki, N., Alramawi, S., Alhejori, K.	Interacting with educational chatbots: A systematic review	Education and Information Technologies	2023	28	1 973-1018	Chatbot, Conversational Agent, Educational Bot, Human-Computer Interaction, Interaction Styles, Literature Review	Chatbots hold the promise of revolutionizing education by engaging learners, personalizing learning activities, supporting educators, and developing deep insight into learners' behavior. However, there is a lack of studies that analyze the recent evidence-based chatbot-learner interaction design techniques applied in education. This study presents a systematic review of 36 papers to understand, compare, and reflect on recent attempts to utilize chatbots in education using seven dimensions: educational field, platform, design principles, the role of chatbots, interaction styles, evidence, and limitations. The results show that the chatbots were mainly designed on a web platform to teach computer science, language, general education, and a few other fields such as engineering and mathematics. Further, more than half of the chatbots were used as teaching agents, while more than a third were peer agents. Most of the chatbots used a predetermined conversational path, and more than a quarter utilized a personalized learning approach that catered to students' learning needs, while other chatbots used experiential and collaborative learning besides other design principles. Moreover, more than a third of the chatbots were evaluated with experiments, and the results primarily point to improved learning and subjective satisfaction. Challenges and limitations include inadequate or insufficient dataset training and a lack of reliance on usability heuristics. Future studies should explore the effect of chatbot personality and localization on subjective satisfaction and learning effectiveness. © 2022, The Author(s).	10.1007/s10639-022-11177-3	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139547878&doi=10.1007/97810639-022-11177-3&partnerID=40&md5=34d457406614009128d69e10fc14fb
A. Lahat, Klang, E.	Can advanced technologies help address the global increase in demand for specialized medical care and improve telehealth services?	J Telemed Telecare	2023		1357633 x231155 520	Telemedicine, artificial intelligence (AI), chatGPT, large language models (LLM), telehealth		10.1177/1357633x231155520	
R. Langevin, Berry, A., Zhang, J., Fockele, C. E., Anderson, L., Hsieh, D., Hartzler, A., Duber, H. C., Hsieh, G.	Implementation fidelity of chatbot screening for social needs: Acceptability, feasibility, appropriateness	Appl Clin Inform	2023				OBJECTIVES: Patient and provider-facing screening tools for social determinants of health have been explored in a variety of contexts; however, effective screening and resource referral remains challenging, and less is known about how patients perceive chatbots as potential social needs screening tools. We investigated patient perceptions of a chatbot for social needs screening using three implementation outcome measures: acceptability, feasibility, and appropriateness. METHODS: We implemented a chatbot for social needs screening at one large public hospital emergency department (ED) and used concurrent triangulation to assess perceptions of the chatbot use for screening. 350 ED visitors completed the social needs screening and rated the chatbot on implementation outcome measures, and 22 participants engaged in follow-up phone interviews. RESULTS: The screened participants ranged in age from 18 to 50 years old and were diverse in race/ethnicity, education, and insurance status. Participants (n=350) rated the chatbot as an acceptable, feasible and appropriate way of screening. Through interviews (n=22), participants explained that the chatbot was a responsive, private, easy to use, efficient, and comfortable channel to report social needs in the ED, but wanted more information on data use and more support in accessing resources. CONCLUSIONS: In this study, we deployed a chatbot for social needs screening in a real-world context and found patients perceived the chatbot to be an acceptable, feasible, and appropriate modality for social needs screening. Findings suggest that chatbots are a promising modality for social needs screening and can successfully engage a large, diverse patient population in the ED. This is significant, as it suggests that chatbots could facilitate a screening process that ultimately connects patients to care for social needs, improving health and well-being for members of vulnerable patient populations.	10.1055/s-2035-5342	

C. Larkin, Djambali, S., Boudreaux, E. D., Vargani, F., Garner, R., Siddique, M., Pietro, J., Tulu, B.	ReachCare Mobile Apps for Patients Experiencing Suicidality in the Emergency Department: Development and Usability Testing Using Mixed Methods	JMIR Form Res	2023	7		#41422	emergency department, engagement, mobile app, mobile phone, suicide, usability	BACKGROUND: Many individuals with suicide risk present to acute care settings such as emergency departments (EDs). However, staffing and time constraints mean that many EDs are not well equipped to deliver evidence-based interventions for patients experiencing suicidality. An existing intervention initiated in the ED for patients with suicide risk (Emergency Department Safety Assessment and Follow-up Evaluation [ED-SAFE]) has been found to be effective but faces trenchant barriers for widespread adoption. OBJECTIVE: On the basis of the ED-SAFE intervention, we aimed to develop 2 apps for patients with suicide risk: a web app guiding patients through safety planning in the ED (ED app) and a smartphone app providing patients components of the ED-SAFE program on their phones after discharge (patient app). We then tested the usability of these apps with patients presenting to the ED with suicide risk. METHODS: Using a user-centered design framework, we first developed user personas to explore the needs and characteristics of patients who are at risk for suicide using inputs from clinicians (n=3) and suicidologists (n=4). Next, we validated these personas during interviews with individuals with lived experience of suicidality (n=6) and used them to inform our application designs. We field-tested the apps with ED patients presenting with suicide risk (n=14) in 2 iterative cycles to assess their usability and engagement using a mixed methods approach. We also rated the quality and fidelity of the safety plans created. RESULTS: We developed 2 interoperable and complementary apps. The first is a web app designed for use on a tablet device during ED admission that guides the patient by creating a safety plan using a chatbot-style interface. The second is a smartphone app for use after discharge and allows the patient to view, edit, and share their completed safety plan, access self-care education, helplines, and behavioral health referrals; and track follow-up appointments with the study clinician. The initial prototype usability testing (n=9) demonstrated satisfactory scores (ED app System Usability Scale [SUS], mean 78.6/100, SD 24.1; User Engagement Scale, mean 3.74/5, SD 0.72; patient app SUS, mean 81.7/100, SD 20.1). After refining the apps based on participant feedback, the second cycle testing (n=5) showed improvement (ED app SUS, mean 90.5/100, SD 9.9; User Engagement Scale, mean 4.07/5, SD 0.36; patient app SUS, mean 97.0/100, SD 1.9). The quality ratings for completed safety plans were satisfactory (Safety Planning Intervention Scoring Algorithm-Brief, mean 27.4, SD 3.4). CONCLUSIONS: By adopting a user-centered approach and creating personas to guide development, we were able to create apps for ED patients with suicide risk and obtain satisfactory usability, engagement, and quality scores. Developing digital health tools based on user-centered design principles that deliver evidence-based intervention components may help overcome trenchant implementation barriers in challenging health care settings.	10.2196/41422	
P. Lee, Fyffe, S., Sor, M., Jia, Z., Yao, Z.	A Paradigm Shift from "Human Writing" to "Machine Generation" in Personality Test Development: an Application of State-of-the-Art Natural Language Processing	Journal of Business and Psychology	2023	38	1	163-190	AI-based assessment, Automatic item generation (AIG), Gender bias, Natural language processing (NLP), Personality, Psychometric properties, Test development	Natural language processing (NLP) techniques have become increasingly popular in areas of psychological assessment. Recently, researchers have sought to use NLP techniques for automatic item generation (AIG) in the personality domain. Nevertheless, NLP-based approaches to personality AIG are new and many questions are still unanswered. Our research builds upon previous illustrations of AIG in personality in several ways. First, we applied a prompt-based generative pre-trained transformer 3 (GPT-3) to generate personality items. This approach provides several practical advantages for researchers and practitioners compared to previous AIG approaches. Second, we thoroughly compared various psychometric properties between machine- and human-authored personality items. Lastly, we examined the measurement invariance of machine-authored personality items between gender groups to ensure fair organizational decision-making. Results revealed that the machine-authored personality items provided good psychometric properties and little measurement biases between genders. Practical considerations, contributions, and future research directions of the AIG technique for non-cognitive tests were discussed. © 2022, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.	10.1007/s10869-022-09864-6	https://www.scopus.com/inward/record.uri?eid=52.0-95143129734&doi=10.1007%2F10869-022-09864-6&partnerID=40&md5=0f04be9528396dd54f0f857a82c7a101
D. M. Levine, Tuwani, R., Komp, B., Varma, A., Fintlayson, S. G., Mehrotra, A., Beam, A.	The Diagnostic and Triage Accuracy of the GPT-3 Artificial Intelligence Model	medRxiv	2023					IMPORTANCE: Artificial intelligence (AI) applications in health care have been effective in many areas of medicine, but they are often trained for a single task using labeled data, making deployment and generalizability challenging. Whether a general-purpose AI language model can perform diagnosis and triage is unknown. OBJECTIVE: Compare the general-purpose Generative Pre-trained Transformer 3 (GPT-3) AI model's diagnostic and triage performance to attending physicians and lay adults who use the Internet. DESIGN: We compared the accuracy of GPT-3's diagnostic and triage ability for 48 validated case vignettes of both common (e.g., viral illness) and severe (e.g., heart attack) conditions to lay people and practicing physicians. Finally, we examined how well calibrated GPT-3's confidence was for diagnosis and triage. SETTING AND PARTICIPANTS: The GPT-3 model, a nationally representative sample of lay people, and practicing physicians. EXPOSURE: Validated case vignettes (<60 words; <6 (H) grade reading level). MAIN OUTCOMES AND MEASURES: Correct diagnosis, correct triage. RESULTS: Among all cases, GPT-3 replied with the correct diagnosis in its top 3 for 88% (95% CI, 75% to 94%) of cases, compared to 54% (95% CI, 53% to 55%) for lay individuals (p<0.001) and 96% (95% CI, 94% to 97%) for physicians (p=0.0354). GPT-3 triaged (71% correct; 95% CI, 57% to 82%) similarly to lay individuals (74%; 95% CI, 73% to 75%; p=0.73); both were significantly worse than physicians (91%; 95% CI, 89% to 93%; p<0.001). As measured by the Brier score, GPT-3 confidence in its top prediction was reasonably well-calibrated for diagnosis (Brier score = 0.18) and triage (Brier score = 0.22). CONCLUSIONS AND RELEVANCE: A general-purpose AI language model without any content-specific training could perform diagnosis at levels close to, but below physicians and better than lay individuals. The model was performed less well on triage, where its performance was closer to that of lay individuals.	10.1101/2023.01.30.23285067	
M. Liebrecht, Schliefer, R., Baadde, A., Bhugra, D., Smith, A.	Generating scholarly content with ChatGPT: ethical challenges for medical publishing	Lancet Digit Health	2023						10.1016/s2589-7500(23)00019-5	
M. K. Looi	Sixty seconds on ... ChatGPT	Bmj	2023	380		205			10.1136/bmj.p205	
J. H. Lubowitz	ChatGPT, An Artificial Intelligence Chatbot, Is Impacting Medical Literature	Arthroscopy	2023						10.1016/j.arthro.2023.01.015	
S. Luca, Clausen, M., Shaw, A., Lee, W., Krishnapillai, S., Adi-Waaran, E., Faghfoury, H., Costain, G., Jobling, R., Aronson, M., Liston, E., Silver, J., Shuman, C., Chad, L., Hayeems, R. Z., Bombard, Y.	Finding the sweet spot: a qualitative study exploring patients' acceptability of chatbots in genetic service delivery	Hum Genet	2023			01. Okt		Chatbots, web-based artificial intelligence tools that simulate human conversation, are increasingly in use to support many areas of genomic medicine. However, patient preferences towards using chatbots across the range of clinical settings are unknown. We conducted a qualitative study with individuals who underwent genetic testing for themselves or their child. Participants were asked about their preferences for using a chatbot within the genetic testing journey. Thematic analysis employing interpretive description was used. We interviewed 30 participants (67% female, 50% 50+ years). Participants considered chatbots to be inefficient for very simple tasks (e.g., answering FAQs) or very complex tasks (e.g., explaining results). Chatbots were acceptable for moderately complex tasks where participants perceived a favorable return on their investment of time and energy. In addition to achieving this "sweet spot," participants anticipated that their comfort with chatbots would increase if the chatbot was used as a complement to but not a replacement for usual care. Participants wanted a "safety net" (i.e., access to a clinician) for needs not addressed by the chatbot. This study provides timely insights into patients' comfort with and perceived limitations of chatbots for genomic medicine and can inform their implementation in practice.	10.1007/s00439-022-02512-2	
S. Luca, Clausen, M., Shaw, A., Lee, W., Krishnapillai, S., Adi-Waaran, E., Faghfoury, H., Costain, G., Jobling, R., Aronson, M., Liston, E., Silver, J., Shuman, C., Chad, L., Hayeems, R. Z., Bombard, Y., Bernier, F., Brudno, M., Carroll, J. C., Cohn, R., Dhallia, I., Friedman, J., Newton, S., Jamieson, T., Kodida, R., Laberge, A.	Finding the sweet spot: a qualitative study exploring patients' acceptability of chatbots in genetic service delivery	Human Genetics	2023				article, chatbot, child, clinical article, comfort, drug safety, female, genetic screening, genomic medicine, human, investment, male, qualitative research, thematic analysis	Chatbots, web-based artificial intelligence tools that simulate human conversation, are increasingly in use to support many areas of genomic medicine. However, patient preferences towards using chatbots across the range of clinical settings are unknown. We conducted a qualitative study with individuals who underwent genetic testing for themselves or their child. Participants were asked about their preferences for using a chatbot within the genetic testing journey. Thematic analysis employing interpretive description was used. We interviewed 30 participants (67% female, 50% 50+ years). Participants considered chatbots to be inefficient for very simple tasks (e.g., answering FAQs) or very complex tasks (e.g., explaining results). Chatbots were acceptable for moderately complex tasks where participants perceived a favorable return on their investment of time and energy. In addition to achieving this "sweet spot," participants anticipated that their comfort with chatbots would increase if the chatbot was used as a complement to but not a replacement for usual care. Participants wanted a "safety net" (i.e., access to a clinician) for needs not addressed by the chatbot. This study provides timely insights into patients' comfort with and perceived limitations of chatbots for genomic medicine and can inform their implementation in practice.	10.1007/s00439-022-02512-2	https://www.embase.com/search/results?subaction=viewrecord&id=120213049638&from=export , http://dx.doi.org/10.1007/s00439-022-02512-2
W. Lukose, Sarode, A. V., Shivkar, R. S.	Impact of Covid-19 on the Usage of AI with Respect to Chat Bots in Hotels	Journal of Pharmaceutical Negative Results	2023	14		577-585	chatbot, medical robot, motion sensor, adult, age article, artificial intelligence, automatic speech recognition, consumer attitude, coronavirus disease 2019, descriptive research, digital technology, human, regression analysis, retrospective study, robotics, young adult	Nobody might at any point imagine that this world would come at a halt in 2020, when the Covid 19 previously hit nobody accepted it could get such gigantic changes which would change the world as far as we might be concerned. It welcomed on many changes like work-from-home, social separating, changes in how cleanliness is kept up with and with it hits to various enterprises as well as an opportunity to arrive at new levels regarding innovation, particularly in lodgings. With the requirement for contactless assistance during the pandemic, the upsurges of an AI attendant turned out to be significantly additionally articulated. The study descriptive in nature and adopted snowball sampling for collecting the data. The study the impact of covid-19 on the usage of artificial intelligence, regression analysis, was applied and found that among AI and RS AI Chat-bots, Motion Detectors, Voice Recognition System) and RS (Online Reservation AI TOOLS INFLUENCING GUEST IN HOTELS 69 Portal), RS is relatively more important than the AI in explaining the guest intensity to stay. Study also explained that customer age is not significantly (0.103) impacted the guest intensity to stay in hotel.	10.47750/jpnr.2023.14.502.70	https://www.embase.com/search/results?subaction=viewrecord&id=12022340423&from=export , http://dx.doi.org/10.47750/jpnr.2023.14.502.70
C. Macdonald, Adedoye, D., Sheikh, A., Rudan, I.	Can ChatGPT draft a research article? An example of population-level vaccine effectiveness analysis	J Glob Health	2023	13		1003	Humans, "Vaccine Efficacy, Computer Simulation, "Software, Confidentiality, Health Personnel	We reflect on our experiences of using Generative Pre-trained Transformer ChatGPT, a chatbot launched by OpenAI in November 2022, to draft a research article. We aim to demonstrate how ChatGPT could help researchers to accelerate drafting their papers. We created a simulated data set of 100 000 health care workers with varying ages, Body Mass Index (BMI), and risk profiles. Simulation data allow analysts to test statistical analysis techniques, such as machine-learning based approaches, without compromising patient privacy. Infections were simulated with a randomized probability of hospitalisation. A subset of these fictitious people was vaccinated with a fictional vaccine that reduced this probability of hospitalisation after infection. We then used ChatGPT to help us decide how to handle the simulated data in order to determine vaccine effectiveness and draft a related research paper. AI-based language models in data analysis and scientific writing are an area of growing interest, and this exemplar analysis aims to contribute to the understanding of how ChatGPT can be used to facilitate these tasks.	10.7189/jogh.13.01003	

Madani, Krause, B., Greene, E. R., Subramanian, S., Mohr, B. P., Holton, J. M., Olmos, J. L., Jr., Xiong, C., Sun, Z. Z., Socher, R., Fraser, J. S., Naik, N.	Large language models generate functional protein sequences across diverse families	Nat Biotechnol	2023					Deep-learning language models have shown promise in various biotechnological applications, including protein design and engineering. Here we describe ProGen, a language model that can generate protein sequences with a predictable function across large protein families, akin to generating grammatically and semantically correct natural language sentences on diverse topics. The model was trained on 280 million protein sequences from >19,000 families and is augmented with control tags specifying protein properties. ProGen can be further fine-tuned to curated sequences and tags to improve controllable generation performance of proteins from families with sufficient homologous samples. Artificial proteins fine-tuned to five distinct lyszyme families showed similar catalytic efficiencies as natural lysozymes, with sequence identity to natural proteins as low as 31.4%. ProGen is readily adapted to diverse protein families, as we demonstrate with chorismate mutase and malate dehydrogenase.	10.1038/s41587-022-01618-2	
T. Mehrali, Cotte, F., Wicks, P., Gilbert, S.	Response to Ben-Shabat et al.'s "Assessing data gathering of chatbot based symptom checkers – A clinical vignettes study"	Int J Med Inform	2023	170		104961	Humans, "Software, "Triage, Diagnosis, Diagnostic accuracy, Diagnostic software, Health information, Limitations, Online, Safety, Symptom checker, Technology, competing financial interests or personal relationships that could have appeared, to influence the work reported in this paper.	10.1016/j.ijmedinf.2022.104961		
T. Mehrali, Cotte, F., Wicks, P., Gilbert, S.	Response to Ben-Shabat et al.'s "Assessing data gathering of chatbot based symptom checkers – A clinical vignettes study"	International Journal of Medical Informatics	2023	170			chatbot, clinical evaluation, human, letter, standardization, symptom, vignette	10.1016/j.ijmedinf.2022.104961	https://www.embase.com/search/results?subaction=viewrecord&id=t2021713153&from=export,http://dx.doi.org/10.1016/j.ijmedinf.2022.104961	
C. Meister, Pimentel, T., Wither, G., Cotterell, R.	Locally Typical Sampling	Transactions of the Association for Computational Linguistics	2023	11		102-121	Today's probabilistic language generators fall short when it comes to producing coherent and fluent text despite the fact that the underlying models perform well under standard metrics (e.g., perplexity). This discrepancy has puzzled the language generation community for the last few years. In this work, we posit that the abstraction of natural language generation as a discrete stochastic process—which allows for an information-theoretic analysis—can provide new insights into the behavior of probabilistic language generators, for example, why high-probability texts can be dull or repetitive. Humans use language as a means of communicating information, aiming to do so in a simultaneously efficient and error-minimizing manner; in fact, psycholinguistics research suggests humans choose each word in a string with this subconscious goal in mind. We formally define the set of strings that meet this criterion: Those for which each word has an information content close to the expected information content, namely, the conditional entropy of our model. We then propose a simple and efficient procedure for enforcing this criterion when generating from probabilistic models, which we call locally typical sampling. Automatic and human evaluations show that, in comparison to nucleus and top-k sampling, locally typical sampling offers competitive performance (in both abstractive summarization and story generation) in terms of quality while consistently reducing degenerate repetitions. © 2023 Association for Computational Linguistics. Distributed under a CC-BY 4.0 license.	10.1162/tac1_a_00536	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146965296&doi=10.1162/tac1_a_00536&partnerID=40&md5=51a183b89eb70c304dc0cc9848740	
S. Michelmann, Kumar, M., Norman, K. A., Teneva, M.	Large language models can segment narrative events similarly to humans	ArXiv	2023				Humans perceive discrete events such as "restaurant visits" and "train rides" in their continuous experience. One important prerequisite for studying human event perception is the ability of researchers to quantify when one event ends and another begins. Typically, this information is derived by aggregating behavioral annotations from several observers. Here we present an alternative computational approach where event boundaries are derived using a large language model, GPT-3, instead of using human annotations. We demonstrate that GPT-3 can segment continuous narrative text into events. GPT-3-annotated events are significantly correlated with human event annotations. Furthermore, these GPT-derived annotations achieve a good approximation of the "consensus" solution (obtained by averaging across human annotations); the boundaries identified by GPT-3 are closer to the consensus, on average, than boundaries identified by individual human annotators. This finding suggests that GPT-3 provides a feasible solution for automated event annotations, and it demonstrates a further parallel between human cognition and prediction in large language models. In the future, GPT-3 may thereby help to elucidate the principles underlying human event perception.			
I. Mijilovic, Shiyakhetho, O., Fedushko, S.	Real Estate App Development Based on AI/VR Technologies	Electronics (Switzerland)	2023	12	3		360° images, AI chatbot, artificial intelligence, Internet of Things, real estate, three-dimensional space (3D), virtual reality	10.3390/electronics12030707	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147828242&doi=10.3390/electronics12030707&partnerID=40&md5=3931699d76fa4683d9646aa75cbe37	
S. R. Mogali	Initial impressions of ChatGPT for anatomy education	Anat Sci Educ	2023					10.1002/ase.2261		
R. Mohammadi Baghmolaei, Ahmadi, A.	Text emotion transfer	Knowledge-Based Systems	2023	262			Emotion recognition, Masked language modeling, Natural language generation, Text style transfer, Transfer learning, Transformers, Character recognition, Computational linguistics, Learning systems, Chatbots, language model, Political news, Transformer, Writing tools, Modeling languages	10.1016/j.knsys.2022.110236	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145977218&doi=10.1016/j.knsys.2022.110236&partnerID=40&md5=b301a3845a38e4b8ab36940b02a12bb	
P. Moons, Van Bulck, L.	ChatGPT: Can artificial intelligence language models be of value for cardiovascular nurses and allied health professionals	Eur J Cardiovasc Nurs	2023					10.1093/eurjcn/zvad022		
R. Morgan, Asilmwe, L., Ager, A. L., Haq, Z., Thumba, L., Shcherbinina, D.	Rehabilitation services must include support for sexual and gender-based violence survivors in Ukraine and other war and conflict-affected countries	Health Policy Plan	2023				Rehabilitation, conflict, gender, violence against women	10.1093/healthp/czad005		
G. Napoles, Holtsma, F., Knoben, A., Jastrzebska, A., Espinosa, M. L.	Prolog-based agnostic explanation module for structured pattern classification	INFORMATION SCIENCES	2023	622		1196-1227	Explainable artificial intelligence, Counterfactual explanations, Symbolic reasoning, Fuzzy clustering, Fuzzy-rough sets	10.1016/j.ins.2022.12.012		

H. Nguyen	Role design considerations of conversational agents to facilitate discussion and systems thinking	Computers and Education	2023	192			Applications in subject areas, Cooperative/collaborative learning, Human-computer interface, Improving classroom teaching, Design, Learning systems, Students, Chatbots, Conversational agents, Cooperative/ collaborative learning, Design considerations, Human computer interfaces, Humaninteraction, Natural language understanding, System thinkings, Systems thinking	Conversational agents can facilitate learning discussions by applying natural language understanding to process students' discourse. Agents can assume the roles of figures such as peers or mentors, to promote actions similar to human interactions. In this study, we explore how and for whom different role designs of a text-based agent (i.e., chatbot) can facilitate discussion patterns and systems thinking in small-group discussions. Participants included 172 students in 9th grade (ages 13–14). Participants were randomly assigned to groups of five students and interacted with no agent, an expert agent, or a less knowledgeable peer agent. Results suggest that both agents facilitated learning of systems mechanisms by enhancing transactive exchange, where students built on prior ideas in their discussion groups. We also found differences in the agents' effects on discussion and learning outcomes based on groups' variation in systems thinking pre-test. Findings highlight the importance of role design considerations of agents in group settings. © 2022 The Author	10.1016/j.compedu.2022.104661		https://www.scopus.com/inward/record.uri?eid=2-s2.0-85141313045&doi=10.1016%2Fj.compedu.2022.104661&partnerID=40&md5=41a62235ad3f0c369a975638c0684c4
T. T. S. Nguyen, Ho, D. H. T., Nguyen, N. T. A.	An Ontology-Based Question Answering System for University Admissions Advising	INTELLIGENT AUTOMATION AND SOFT COMPUTING	2023	36	1	601-616	Ontology, chatbots, answer-based systems, domain knowledge base, admissions advising	Question-Answer systems are now very popular and crucial to support human in automatically responding frequent questions in many fields. However, these systems depend on learning methods and training data. Therefore, it is necessary to prepare such a good dataset, but it is not an easy job. An ontol-ogy-based domain knowledge base is able to help to reason semantic information and make effective answers given user questions. This study proposes a novel chatbot model involving ontology to generate efficient responses automatically. A case study of admissions advising at the International University-VNU HCMC is taken into account in the proposed chatbot. A domain ontology is designed and built based on the domain knowledge of university admissions using Protege. The Web user interface of the proposed chatbot system is developed as a prototype using NetBeans. It includes a search engine reasoning the ontology and generating answers to users' questions. Two experiments are carried out to test how the system reacts to different questions. The first experiment examines questions made from some templates, and the second one examines normal questions taken from frequent requests. Experimental results have shown that the ontology-based chatbot can release meaningful and long answers. The results are analysed to prove the proposed chatbot is usable and promising.	10.32604/aisc.2023.032080		
W. Ni, Shi, Q., Liu, T., Zeng, Q., Xu, L.	Generating textual emergency plans for unconventional emergencies — A natural language processing approach	Safety Science	2023	160			article, decision making, deep learning, emergency patient, feasibility study, human, human experiment, knowledge base, natural language processing	An emergency plan is an emergency administrative document that specifies the course of actions taken to minimize the effects of a crisis or incident. Establishing high-quality emergency plans has been a fundamental task for various emergency administrative agencies. Traditionally, emergency plans are developed based on the experiences of handling past emergencies, thus may not be well applied to unconventional emergencies that arise in an unrepeatable and unpredictable manner. This work proposes a novel emergency plan generation approach to assist decision-making under unconventional emergent situations. This goal is achieved by leveraging deep-learning-based natural language techniques to explore the interrelationship between existing emergency plans developed for common emergencies and the target unconventional emergency. In particular, an emergency response knowledge base is constructed based on a large number of existing emergency plans, and the relevant part with respect to the target unconventional emergency is retrieved. Then the new emergency plan is formed by organizing the relevant knowledge guided by a pre-defined emergency plan template. Furthermore, a novel emergency plan evaluation approach is proposed to perform a comprehensive evaluation of the quality of generated emergency plans. Empirical results on a real-world unconventional emergency case verify the feasibility of our emergency plan generation approach.	10.1016/j.ssci.2022.106047		https://www.embase.com/search/results?subaction=viewrecord&id=12022079183&from=export,http://dx.doi.org/10.1016/j.ssci.2022.106047
W. J. Ni, Shi, Q. L., Liu, T., Zeng, Q. T., Xu, L. Z.	Generating textual emergency plans for unconventional emergencies A natural language processing approach	SAFETY SCIENCE	2023	160			Emergency plan, Unconventional emergency, Natural language processing, Deep learning, Natural language generation, GROUP DECISION-MAKING, RISK RESPONSE, MANAGEMENT, MODEL, OPTIMIZATION, ONTOLOGY, CRITERIA	An emergency plan is an emergency administrative document that specifies the course of actions taken to minimize the effects of a crisis or incident. Establishing high-quality emergency plans has been a fundamental task for various emergency administrative agencies. Traditionally, emergency plans are developed based on the experiences of handling past emergencies, thus may not be well applied to unconventional emergencies that arise in an unrepeatable and unpredictable manner. This work proposes a novel emergency plan generation approach to assist decision-making under unconventional emergent situations. This goal is achieved by leveraging deep-learning-based natural language techniques to explore the interrelationship between existing emergency plans developed for common emergencies and the target unconventional emergency. In particular, an emergency response knowledge base is constructed based on a large number of existing emergency plans, and the relevant part with respect to the target unconventional emergency is retrieved. Then the new emergency plan is formed by organizing the relevant knowledge guided by a pre-defined emergency plan template. Furthermore, a novel emergency plan evaluation approach is proposed to perform a comprehensive evaluation of the quality of generated emergency plans. Empirical results on a real-world unconventional emergency case verify the feasibility of our emergency plan generation approach.	10.1016/j.ssci.2022.106047		
E. K. Dermann, Kondolioka, D.	On Chatbots and Generative Artificial Intelligence	Neurosurgery	2023						10.1227/neu.00000000000002415		
U. Orlhan, Tosun, E. G., Ozkaya, O.	Intent Detection Using Contextualized Deep SemSpace	Arabian Journal for Science and Engineering	2023	48	2	2009-2020	Bidirectional long short-term memory, Generalized SemSpace, Intent detection, Natural language understanding, Synset vectors, WordNet	In this study, a new approach called Contextualized Deep SemSpace is proposed for intent detection. First, the synset vectors are determined by training the generalized SemSpace method with the WordNet 3.1 data. Then, each word in an intent dataset is transformed into a synset vector by a contextualized approach, and finally, the synset vectors are trained with a deep learning model using BLSTM. Since the proposed approach adapts the contextualized semantic vectors to the dataset with a deep learning model, it treats like one of contextualized deep embeddings like BERT, ELMo, and GPT-3 methods. In order to measure the success of the proposed approach, some experiments have been carried out on six well-known intent detection benchmark datasets (ATIS, Snips, Facebook, Ask Ubuntu, WebApp, and Chatbot). Although the dependence of its vocabulary on WordNet causes a serious number of out of vocabulary problems, results showed that the proposed approach is the most successful intent classifier in the literature. According to these results, it can be said that deep learning-based contextualized synset vectors can be used successfully in many problems. © 2022, King Fahd University of Petroleum & Minerals.	10.1007/s13369-022-07016-9		https://www.scopus.com/inward/record.uri?eid=2-s2.0-8513403825&doi=10.1007%2F13369-022-07016-9&partnerID=40&md5=ca89a68b6f54eb1f92630b08a88f878
J. A. Ortiz-Zambrano, Espin-Riofrio, C., Montejoraez, A.	Combining Transformer Embeddings with Linguistic Features for Complex Word Identification	ELECTRONICS	2023	12	1		lexical complexity prediction, linguistic features, features fusion, pre-trained large language models	Identifying which words present in a text may be difficult to understand by common readers is a well-known subtask in text complexity analysis. The advent of deep learning has established the new state-of-the-art in this task by means of end-to-end semi-supervised (pre-trained) and downstream training of, mainly, transformer-based neural networks. Nevertheless, the usefulness of traditional linguistic features in combination with neural encodings is worth exploring, as the computational cost needed for training and running such networks is becoming more and more relevant with energy-saving constraints. This study explores lexical complexity prediction (LCP) by combining pre-trained and adjusted transformer networks with different types of traditional linguistic features. We apply these features over classical machine learning classifiers. Our best results are obtained by applying Support Vector Machines on an English corpus in an LCP task solved as a regression problem. The results show that linguistic features can be useful in LCP tasks and may improve the performance of deep learning systems.	10.3390/electronics12010120		
J. Pan	Large language model for molecular chemistry	Nature Computational Science	2023	3	1	5			10.1038/433588-023-00399-1		https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146818464&doi=10.1038%2F433588-023-00399-1&partnerID=40&md5=3a6a31b29f43725a9a3bb12518a780
M. Paranthama N. Gayathri, T., Kanishka, S., Lavanya, R.	Chatbot for Hospital Management Using AI	SOFT COMPUTING FOR SECURITY APPLICATIONS, ICSCS 2022	2023	1428		367-378	Artificial intelligence, Support vector machine [SVM], Natural language processing [NLP], Preprocessing, Combination, Extraction, Voice note, Code word, Text mining algorithm	As the world becomes more digitalized, technologies have been enhancing day by day and are interconnected in all aspects. It is tedious to book an appointment with doctors for all the health-related issues in person. The aim is to create a medical bot application using AI from where we can consult a doctor from our comfort at home. This will assist by reducing travel expenses and enhancing availability to medical understanding through a medical chatbot under our roof. It is among the most efficient and time-saving innovations, but in need to do many chores, chatbots must be made better in the medical community. The proposed design is using AI to develop a medical chatbot that can diagnose disorders and provide basic information before approaching a doctor. To overcome this limitation, this project creates a platform for humans to interact with a talkbot that has been intensively developed on data sets using machine learning methods. Instead of taking a logical approach to compilation, machine learning algorithms take a more natural approach. The information is kept in the directory in order to identify the code word, resolve the query, and respond to the question.	10.1007/978-981-19-3590-9_28		
D. Y. Park, Kim, H.	Determinants of Intentions to Use Digital Mental Healthcare Content among University Students, Faculty, and Staff: Motivation, Perceived Usefulness, Perceived Ease of Use, and Parasocial Interaction with AI Chatbot	Sustainability (Switzerland)	2023	15	1		artificial intelligence chatbot, depression, digital mental healthcare content, eHealth, mHealth, technology acceptance model, uses and gratifications theory, artificial intelligence, mental health, perception, software, student, theoretical study, university sector	Depression is a worldwide health issue to which various physical, psychological, and social health problems are attributable. To address the issue through the promotion of digital mental healthcare content use, this study examines factors influencing people's intentions to use the content, guided by the technology acceptance model and uses and gratifications theory. A total of 278 students and faculty/staff members at a Korean university tried using a digital mental healthcare content (e.g., artificial intelligence chatbot content) called MyMentalPocket and completed a survey questionnaire associated with their perceptions of the content. Participants' depression levels, perceived usefulness, and parasocial interactions emerged as significant and positive factors influencing people's intentions to use MyMentalPocket. Female gender, younger age, and specific motives for depression-related digital technology use (i.e., communication and emotional support, information- and guidance-seeking, and habitual entertainment-seeking motives) emerged as significant and positive factors influencing parasocial interactions. Parasocial interactions and perceived ease of use emerged as significant and positive factors influencing perceived usefulness. The findings from this study imply the utility of AI chatbots as a way to help people, especially females and younger people with depression and interpersonal difficulties, to utilize and benefit from digital mental healthcare content for depression management. © 2023 by the authors.	10.3390/su15010872		https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146030208&doi=10.3390%2Fsu15010872&partnerID=40&md5=958e19ee3fc7f841358b18f02f09941ab0ea855
S. H. Park	Authorship Policy of the Korean Journal of Radiology Regarding Artificial Intelligence: Large Language Models Such as ChatGPT	Korean J Radiol	2023						10.3348/kjr.2023.0112		
S. B. Patel, Lam, K.	CHAISPT: the future of discharge summaries?	Lancet Digit Health	2023						10.1016/j.s2589-7500(23)00021-3		
G. Pavone, Meyer-Waarden, L., Munzel, A.	Rage Against the Machine: Experimental Insights into Customers' Negative Emotional Responses, Attributions of Responsibility, and Coping Strategies in Artificial Intelligence–Based Service Failures	Journal of Interactive Marketing	2023	58	1	52-71	anthropomorphic visual cues, artificial intelligence-based chatbots, attributions of responsibility, coping strategies, negative emotions, service failure	In their interactions with chatbots, consumers often encounter technology failures that evoke negative emotions, such as anger and frustration. To clarify the effects of such encounters, this article addresses how service failures involving artificial intelligence-based chatbots affect customers' emotions, attributions of responsibility, and coping strategies. In addition to comparing the outcomes of a service failure involving a human agent versus a chatbot (Study 1), the research framework integrates the potential influences of anthropomorphic visual cues and intentionality (Studies 2 and 3). Through three experimental designs, the question arises when interacting with chatbots, customers blame the company more for the negative outcome, experiencing mainly frustration, compared with when they interact with a human agent. As the chatbot is perceived as not having intentions and control over them, it is not considered responsible. Thus, the company bears more responsibility for the poor service performance. However, the authors suggest that anthropomorphic visual cues might help mitigate the negative attributions to the company. The attribution of humanlike characteristics also helps promote both problem-focused coping, which helps consumers actively handle the service failure, and emotion-focused coping, which helps restore the emotional balance disrupted by the negative event. © American Marketing Association 2022.	10.1177/10949968221134492		https://www.scopus.com/inward/record.uri?eid=2-s2.0-8514985485&doi=10.1177%2F10949968221134492&partnerID=40&md5=37736e7df1cccf6727d356101ab0ea855

K. Perez-Ramos, Leon-Thomas, M., Smith, S. L., Silverman, L., Perez-Torres, C., Hall, W. C., Iadarola, S., Ma, X.	COVID-19 Vaccine Equity and Access: Case Study for Health Care Chatbots	JMIR Form Res	2023	7	e39045	Covid-19, Ict, Information and Communication Technology, chatbot, chatbot development, chatbot tool, community, health care gap, health disparity, health equity, health information, health outcome, mHealth, minority population, mobile health, user experience	BACKGROUND: Disparities in COVID-19 information and vaccine access have emerged during the pandemic. Individuals from historically excluded communities (eg. Black and Latin American) experience disproportionately negative health outcomes related to COVID-19. Community gaps in COVID-19 education, social, and health care services (including vaccines) should be prioritized as a critical effort to end the pandemic. Misinformation created by the politicization of COVID-19 and related public health measures has magnified the pandemic's challenges, including access to health care, vaccination and testing efforts, as well as personal protective equipment. Information and Communication Technology (ICT) has been demonstrated to reduce the gaps of marginalization in education and access among communities. Chatbots are an increasingly present example of ICTs, particularly in health care and in relation to the COVID-19 pandemic. OBJECTIVE: This project aimed to (1) follow an inclusive and theoretically driven design process to develop and test a COVID-19 information ICT bilingual (English and Spanish) chatbot tool named "Ana" and (2) characterize and evaluate user experiences of these innovative technologies. METHODS: Ana was developed following a multitheoretical framework, and the project team was comprised of public health experts, behavioral scientists, community members, and medical team. A total of 7 iterations of 8 chatbots were tested, and a total of 22 8 testers participated in this process. Content was curated primarily to provide users with factual answers to common questions about COVID-19. To ensure relevance of the content, topics were driven by community concerns and questions, as ascertained through research. Ana's repository of educational content was based on national and international organizations as well as interdisciplinary experts. In the context of this development and pilot project, we identified an evaluation framework to explore reach, engagement, and satisfaction. RESULTS: A total of 626 community members used Ana from August 2021 to March 2022. Among those participants, 346 used the English version, with an average of 43 users per month; and 280 participants used the Spanish version, with an average of 40 users monthly. Across all users, 63.87% (n=211) of English users and 22.14% (n=62) of Spanish users returned to use Ana at least once; 18.49% (n=64) among the English version users and 15.57% (n=52) among the Spanish version users reported their ranking. Positive ranking comprised the "smiley" and "loved" emojis, and negative ranking comprised the "neutral," "sad," and "mad" emojis. When comparing negative and positive experiences, the latter was higher across Ana's platforms (English: n=41, 64.06%; Spanish: n=41, 77.35%) versus the former (English: n=23, 35.93%; Spanish: n=12, 22.64%). CONCLUSIONS: This pilot project demonstrated the feasibility and capacity of an innovative ICT to share COVID-19 information within diverse communities. Creating a chatbot like Ana with bilingual content contributed to an equitable approach to address the lack of accessible COVID-19-related information.	10.2196/39045			
K. Peyton, Umkrisnhan, S.	A comparison of chatbot platforms with the state-of-the-art sentence BERT for answering online student FAQs	RESULTS IN ENGINEERING	2023	17		Chatbots, SBERT, Natural language understanding, FAQs, Online learning	Online learning enables academic institutions to accommodate increased student numbers at scale. With this scale comes high demands on support staff for help in dealing with general questions relating to qualifications and registration. Chatbots that implement Frequently Asked Questions (FAQs) can be a valuable part in this support process. A chatbot can provide constant availability in answering common questions, allowing support staff to engage on higher value one-to-one communication with prospective students. A variety of approaches can be used to create these chatbots including vertical platforms, frameworks, and direct model implementation. A comparative analysis is required to establish which approach provides the most accuracy for an existing, available dataset. This paper compares intent classification results of two popular chatbot frameworks to a state-of-the-art Sentence BERT (SBERT) model that can be used to build a robust chatbot. A methodology is outlined which includes the preparation of a university FAQ dataset into a chatbot friendly format for upload and training of each implementation. Results obtained from the framework-based implementations are generated using their published Application Programming Interfaces (APIs). This enables intent classification using testing phrases and finally comparison of F1 scores.Using ten intents comprising 284 training phrases and 85 testing phrases it was found that a SBERT model outperformed all others with an F1-score of 0.99. Initial comparison with the literature suggests that the F1-scores obtained for Google Dialogflow (0.96) and Microsoft Qna Maker (0.95) are very similar to other benchmarking exercises where NLU (Natural Language Understanding) has been compared.	10.1016/j.rineng.2022.100856			
M. Pivdort, Greene, C. S.	A publishing infrastructure for AI-assisted academic authoring	bioRxiv	2023				In this work we investigate how models with advanced natural language processing capabilities can be used to reduce the time-consuming process of writing and revising scholarly manuscripts. To this end, we integrate large language models into the Manusbot publishing ecosystem to suggest revisions for scholarly text. We tested our AI-based revision workflow in three case studies of existing manuscripts, including the present one. Our results suggest that these models can capture the concepts in the scholarly text and produce high-quality revisions that improve clarity. Given the amount of time that researchers put into crafting prose, we anticipate that this advance will revolutionize the type of knowledge work performed by academics.	10.1101/2023.01.21.525030			
S. Polesie, Larko, O.	Use of Large Language Models: Editorial Comments	Acta Derm Venereol	2023	103	adv00874			10.2340/actadv.v103.9593			
Y. Qiao, Yu, Y., Liu, S., Wang, Z., Xia, Z., Qiao, J.	Graph Convolution-Enhanced Multi-Channel Decoding Joint Entity and Relation Extraction Model	Jisuanji Yanjiu yu Faizhan/Computer Research and Development	2023	60	1153-166	Encoder-decoder, Graph convolution neural network, Multi-channel decoding, Relation extraction, Relation overlapping, Backpropagation, Channel coding, Classification (of information), Data mining, Decoding, Extraction, Natural language processing systems, Network coding, Text processing, Channel decoding, Convolution neural network, Entity extractions, Extraction modeling, Multi channel, Convolution	Extracting relational triplets from unstructured natural language texts are the most critical step in building a large-scale knowledge graph, but existing researchers still have the following problems: 1) Existing models ignore the problem of relation extraction caused by multiple triplets sharing the same entity in text; 2) The current encoder-decoder model based on an encoder-decoder does not fully consider the dependency relationship among words in the text; 3) The excessively long sequence of triplets leads to the accumulation and propagation of errors, which affects the precision and efficiency of relation extraction in entity. Based on this, a graph convolution-enhanced multi-channel decoding joint entity and relation extraction model (GMCD-JERE) is proposed. First, the BiLSTM is introduced as a model encoder to strengthen the two-way feature fusion of words in the text; second, the dependency relationship between the words in the sentence is merged through the graph convolution multi-hop mechanism to improve the accuracy of relation classification; third, through multi-channel decoding mechanism, the model solves the problem of relation overlapping, and alleviates the effect of error accumulation and propagation at the same time; fourth, the experiment selects the current three mainstream models for performance verification, and the results on the NYT (New York times) dataset show that the accuracy rate, recall rate, and F1 are increased by 4.3%, 5.1% and 4.8%. Also, the extraction order starting with the relation is verified in the WebNLG (Web natural language generation) dataset. © 2023, Science Press. All right reserved.	10.7544/issn1000-1239.202110767	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146144546&doi=10.7544%2fissn1000-1239.202110767&partnerID=40&m5=3398ca0282775753da1536760a8f823		
Q. Qiu, Tian, M., Ma, X., Tao, Y. J., Xie, Z.	A question answering system based on mineral exploration ontology generation: A deep learning methodology	Ore Geology Reviews	2023	153		BERT model, Corpus construction, Geological ontology, Natural language processing, Question answering, Deep learning, Electric transformer testing, Geology, Information filtering, Mineral exploration, Minerals, Natural language processing systems, Search engines, Bidirectional encoder representation from transformer model, Language processing, Large amounts, Natural languages, Ontology's, Transformer modeling, Ontology, data set, experimental study, learning, source rock	Mineral exploration reports and documents are a rich data source that contains a large amount of geological environments in which mineral deposits form. Among them, it is difficult to extract the required answers from the large amount of geological data. Despite the availability of search engines and digital databases that can be used to store geological data, users are unable to retrieve the information needed for a specific field in a timely manner. As a result, users usually have to contend with the burden of browsing and filtering information, which can be a time-consuming process. To address this issue, we propose a robust end-to-end approach that can improve the efficiency and effectiveness of retrieving queries related to mineral exploration terms. First, we present an automated workflow for constructing automatic question-and-answer datasets based on the names and definitions in the mineral exploration ontology. The Bidirectional Encoder Representation from Transformers (BERT) model is trained to test the answers generated from the user input question. Finally, a prototype chatbot system based on the WeChat platform and constructed experiments for evaluation is presented. Our proposed method has powerful feature representation and learning capabilities and thus has the potential to be adopted by other specialized fields (especially where a large number of mineral exploration ontologies already exist). © 2023 The Authors	10.1016/j.oregeorev.2023.105294	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146146633&doi=10.1016%2fj.oregeorev.2023.105294&partnerID=40&m5=ce2a01fc84392f16bd0ab35aca71		
Q. J. Qiu, Tian, M., Ma, K., Tan, Y. J., Tao, L. F., Xie, Z.	A question answering system based on mineral exploration ontology generation: A deep learning methodology	ORE GEOLOGY REVIEWS	2023	153		Geological ontology, Question answering, Natural language processing, BERT model, Corpus construction, GEOSCIENCE, EXTRACTION	Mineral exploration reports and documents are a rich data source that contains a large amount of geological environments in which mineral deposits form. Among them, it is difficult to extract the required answers from the large amount of geological data. Despite the availability of search engines and digital databases that can be used to store geological data, users are unable to retrieve the information needed for a specific field in a timely manner. As a result, users usually have to contend with the burden of browsing and filtering information, which can be a time-consuming process. To address this issue, we propose a robust end-to-end approach that can improve the efficiency and effectiveness of retrieving queries related to mineral exploration terms. First, we present an automated workflow for constructing automatic question-and-answer datasets based on the names and definitions in the mineral exploration ontology. The Bidirectional Encoder Representation from Transformers (BERT) model is trained to test the answers generated from the user input question. Finally, a prototype chatbot system based on the WeChat platform and constructed experiments for evaluation is presented. Our proposed method has powerful feature representation and learning capabilities and thus has the potential to be adopted by other specialized fields (especially where a large number of mineral exploration ontologies already exist).	10.1016/j.oregeorev.2023.105294			
S. Rajwal	Design of a Chatbot for Four- to Ten-Year-Old Children Based on Emotional Intelligence	INTERNATIONAL CONFERENCE ON INNOVATIVE COMPUTING AND COMMUNICATIONS, ICICC 2022, VOL. 1	2023	473	675-683	Chatbot, Natural language processing, Child, Emotional intelligence, Child-smartphone interaction	The development of emotional intelligence in children begins during the early years of a child. Although it is the responsibility of parents to help a child in developing emotional awareness, studies have shown the utility of software systems in aiding this process. In this paper, the author presents the design of an emotionally intelligent chatbot for children. The outcomes of an online survey conducted among the parents reported that 70% of the respondents felt that an emotionally intelligent interactive chatbot can be useful for children to cope with intense subject matters related to low grades, no friends, bullies, and others. The study highlights various features of a chatbot like a user interface, personalization, responsiveness, security, and human intervention. From the findings, the author has suggested five design principles along with the detailed architecture of a chatbot framework. The paper will be useful for future studies that seek to design and develop a highly efficient emotionally intelligent chatbot for children which is trusted by their parents.	10.1007/978-981-19-2821-5_57			
A. Rao, Kim, J., Kamineni, M., Pang, M., Lie, W., Succi, M. D.	Evaluating ChatGPT as an Adjunct for Radiologic Decision-Making	medRxiv	2023				BACKGROUND: ChatGPT, a popular new large language model (LLM) built by OpenAI, has shown impressive performance in a number of specialized applications. Despite the rising popularity and performance of AI, studies evaluating the use of LLMs for clinical decision support are lacking. PURPOSE: To evaluate ChatGPT's capacity for clinical decision support in radiology via the identification of appropriate imaging services for two important clinical presentations: breast cancer screening and breast pain. MATERIALS AND METHODS: We compared ChatGPT's responses to the American College of Radiology (ACR) Appropriateness Criteria for breast pain and breast cancer screening. Our prompt formats included an open-ended (OE) format, where ChatGPT was asked to provide the single most appropriate imaging procedure, and a select all that apply (SATA) format, where ChatGPT was given a list of imaging modalities to assess. Scoring criteria evaluated whether proposed imaging modalities were in accordance with ACR guidelines. RESULTS: ChatGPT achieved an average OE score of 1.83 (out of 2) and a SATA average percentage correct of 88.9% for breast cancer screening prompts, and an average OE score of 1.125 (out of 2) and a SATA average percentage correct of 58.3% for breast pain prompts. CONCLUSION: Our results demonstrate the feasibility of using ChatGPT for radiologic decision making, with the potential to improve clinical workflow and responsible use of radiology services.	10.1101/2023.02.02.23285399			
R. Ren, Castro, J. W., Santos, A., Dieste, O., Acuna, S. T.	Using the SOCIO Chatbot for UML Modelling: A Family of Experiments	IEEE Transactions on Software Engineering	2023	49	1364-383	Chatbots, family of experiments, modelling, usability, Graphic methods, Groupware, Job analysis, Natural language processing systems, Social networking (online), Usability engineering, Class diagrams, Family of experiment, Modeling, Task analysis, Virtual assistants, Unified Modeling Language	Context: Recent developments in natural language processing have facilitated the adoption of chatbots in typically collaborative software engineering tasks (such as diagram modelling). Families of experiments can assess the performance of tools and processes and, at the same time, alleviate some of the physical shortcomings of individual experiments (e.g., inaccurate and potentially biased results due to a small number of participants). Objective: Compare the usability of a chatbot for collaborative modelling (i.e., SOCIO) and an online web tool (i.e., Creately). Method: We conducted a family of three experiments to evaluate the usability of SOCIO against the Creately online collaborative tool in academic settings. Results: The student participants were faster at building class diagrams using the chatbot than with the online collaborative tool and more satisfied with SOCIO. Besides, the class diagrams built using the chatbot tended to be more concise - albeit slightly less complete. Conclusion: Chatbots appear to be helpful for building class diagrams. In fact, our study has helped us to shed light on the future direction for experimentation in this field and lays the groundwork for researching the applicability of chatbots in diagramming. © 2022 IEEE.	10.1109/TSE.2022.3150720	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85124813384&doi=10.1109%2fTSE.2022.3150720&partnerID=40&m5=1cae6f002214a066cb86154dd085f41		

T. Rietz, Maedche, A.	Ladderbot—A conversational agent for human-like online ladderbot interviews	International Journal of Human Computer Studies	2023	171			Chatbot, Laddering, Means-end approach, Smartphone values, Value-oriented research, Agent based, Chatbots, Conversational agents, Human like, Mean-end approach, Means ends, Smart phones, Smartphone value, Smartphones	In user research, ladderbot interviews are particularly helpful in eliciting goals and underlying values. However, ladderbot interviews do not scale due to being time and training intensive. In this study, we propose and evaluate Ladderbot, a text-based conversational agent (CA) capable of facilitating human-like online ladderbot interviews. Ladderbot uses techniques inspired by face-to-face ladderbot to engage in an interactive conversation with users. In a between-subject experimental study with 256 participants, we compare Ladderbot against established survey-based ladderbot approaches in exploring user values for smartphone use. We find that on average, participants participating in CA-based ladderbot interviews produce twice as many and significantly longer answers. Additionally, we identify the learnability of the CA-based interviews to be significantly higher compared to established survey-based ladderbot approaches. However, survey-based ladderbot more reliably produces ladders that end in values, while CA-based ladderbot trades clear attribute-consequence-value structures to explore negative gains. Therein, besides presenting a new CA-based ladderbot approach, our study has implications for how user researchers can utilize both survey- and CA-based ladderbot methods to paint a more complete and comprehensive picture. © 2022 Elsevier Ltd	10.1016/j.jhcs.2022.102969	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144501432&doi=10.1016%2Fj.jhcs.2022.102969&partnerID=40&md5=92a6850a97494fe815fc511a3221fbb
B. Robinson	Speculative Propositions for Digital Writing Under the New Autonomous Model of Literacy	Postdigital Science and Education	2023	5	1	117-135		The proliferation of powerful new forms of automated assistive writing technologies, natural language generation technologies in particular, raises crucial questions about the future of literacy living and learning. This article situates such technologies within the historical trajectory of literacy studies, arguing that the acceleration of natural language generation platforms like GPT-3 may reflect the emergence of a new autonomous model of literacy. Guided by recent theoretical work on automation and global computation, the article offers a series of speculative propositions for digital writing under the new autonomous model of literacy, focusing on questions of agency and subjectivity within a regime of computational racial capitalism. The article concludes with a gesture towards a resistive digital writing pedagogy wherein literacy scholars, educators, and students can resist the dominating potentials of technologies ostensibly designed to assist them. © 2022, The Author(s), under exclusive licence to Springer Nature Switzerland AG.	10.1007/s42438-022-00358-5	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142456192&doi=10.1007%2F42438-022-00358-5&partnerID=40&md5=7c6e43ea23a1191ede092bf6ea9588
K. S. Robinson	Static Control for Roll-to-Roll Manufacturing	IEEE Transactions on Industry Applications	2023	59	1	93-103	Electrostatic analysis, electrostatic processes, ESD, hazardous areas, manufacturing processes, plastics industry, safety, sparks, control systems, Elastomers, Electrostatic devices, Fault tolerance, Polypropylenes, Process control, Surveys, Accumulated charge, Chatbots, Electrostatic process, Fault-tolerant systems, Hazardous area, Manufacturing, Manufacturing process, Plastic industry, Static control, Accident prevention	Roll-to-roll (R2R) manufacturing is used extensively in printing and flexible packaging industries. These commercially important markets exceeded \$308 USD annually in the US in 2019 with employment of about 79,000. In addition, R2R operations are increasingly used to produce flexible electronic products and medical devices, which are easily damaged by electrostatic discharges (ESD). Many materials used in R2R operations such as polypropylene are insulating materials that produce and accumulating static charges. Sparks from accumulated charges can ignite fires, injury employees, and damage products. Accumulated charges also cause static cling, which can disrupt machine operations. I estimate that waste caused by static electricity from injuries, damaged products, and machine downtime exceeds \$600M USD annually in the US. This human suffering and waste may be eliminated by effective static control systems. Implementing effective static control on an R2R manufacturing line is a 4-step, data-driven process. First, identify sources of static charging with a static survey. Next, install static dissipaters forming a fault-tolerant, static control system. Once static dissipaters are operational, verify that static is well controlled with second static survey. Lastly, maintain static performance by regularly verifying static performance and by including static control in Management of Change procedures. © 1972-2012 IEEE.	10.1109/TIA.2022.3213229	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139862752&doi=10.1109%2FTIA.2022.3213229&partnerID=40&md5=2a18412848406039f59962c2b70095
K. Roy, Gaur, M., Soltani, M., Rawte, V., Kalyan, A., Sheth, A.	Proknow: Process knowledge for safety constrained and explainable question generation for mental health diagnostic assistance	Frontiers in Big Data	2023	5			explainability, mental health, natural language generation, process knowledge, safety	Virtual Mental Health Assistants (VMHAs) are utilized in health care to provide patient services such as counseling and suggestive care. They are not used for patient diagnostic assistance because they cannot adhere to safety constraints and specialized clinical process knowledge (Proknow) used to obtain clinical diagnoses. In this work, we define Proknow as an ordered set of information that maps to evidence-based guidelines or categories of conceptual understanding to experts in a domain. We also introduce a new dataset of diagnostic conversations guided by safety constraints and Proknow that healthcare professionals use (Proknow-data). We develop a method for natural language question generation (NLG) that collects diagnostic information from the patient interactively (Proknow-agent). We demonstrate the limitations of using state-of-the-art large-scale language models (LLMs) on this dataset. Proknow-algo incorporates the process knowledge through explicitly modeling safety, knowledge capture, and explainability. As computational metrics for evaluation do not directly translate to clinical settings, we involve expert clinicians in designing evaluation metrics that test four properties: safety, logical coherence, and knowledge capture for explainability while minimizing the standard cross entropy loss to preserve distribution semantics-based similarity to the ground truth. LLMs with Proknow-algo generated 89% safer questions in the depression and anxiety domain (tested property: safety). Further, without Proknow-algo generations question did not adhere to clinical process knowledge in Proknow-data (tested property: knowledge capture). In comparison, Proknow-algo-based generations yield a 96% reduction in our metrics to measure knowledge capture. The explainability of the generated question is assessed by computing similarity with concepts in depression and anxiety knowledge bases. Overall, irrespective of the type of LLMs, Proknow-algo achieved an averaged 82% improvement over simple pre-trained LLMs on safety, explainability, and process-guided question generation. For reproducibility, we will make Proknow-data and the code repository of Proknow-algo publicly available upon acceptance. Copyright © 2023 Roy, Gaur, Soltani, Rawte, Kalyan and Sheth.	10.3389/fdata.2022.1056728	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85146923257&doi=10.3389%2Ffdata.2022.1056728&partnerID=40&md5=5da782b1dc6cf62ffae4544c1a619765
M. C. Sáiz-Manzanera, Sánchez, R., Martín-Antón, L. J., González-Díez, I., Almeida, L.	Perceived satisfaction of university students with the use of chatbots as a tool for self-regulated learning	Heliyon	2023	9	1	e12843	Chatbot, Effective learning, Higher education, Metacognitive strategies, Prior knowledge, personal relationships that could have appeared to influence the work reported in, this paper.	Chatbots are a promising resource for giving students feedback and helping them deploy metacognitive strategies in their learning processes. In this study we worked with a sample of 57 university students, 42 undergraduate and 15 Master's degree students in Health Sciences. A mixed research methodology was applied. The quantitative study analysed the influence of the variables educational level (undergraduate vs. master's degree) and level of prior knowledge on the frequency of chatbot use (low vs. average), learning outcomes, and satisfaction with the chatbot's usefulness. In addition, we examined whether the frequency of chatbot use depended on students' metacognitive strategies. The qualitative study analysed the students' suggestions for improvement to the chatbot and the type of questions it used. The results indicated that the level of degree being studied influenced the frequency of chatbot use and learning outcomes, with Master's students exhibiting higher levels of both, but levels of prior knowledge only influenced learning outcomes. Significant differences were also found in students' perceived satisfaction with the use of the chatbot, with Master's students scoring higher, but not with respect to the level of prior knowledge. No conclusive results were found regarding frequency of chatbot use and the levels of students' metacognitive strategies. Further studies are needed to guide this research based on the students' suggestions for improvement.	10.1016/j.heliyon.2023.e12843	
A. B. Saka, Oyedele, L. O., Akambi, L. A., Ganiyu, S. A., Chan, D. W. M., Bello, S. A.	Conversational artificial intelligence in the AEC industry: A review of present status, challenges and opportunities	Advanced Engineering Informatics	2023	55			Artificial Intelligence, Chatbot, Conversational agents, Conversational artificial intelligence, Tourism, Architecture engineering, Artificial intelligence systems, Chatbots, Human language, Language processing, Natural languages, Present status, State of research, Natural language processing systems	The idea of developing a system that can converse and understand human languages has been around since the 1200 s. With the advancement in artificial intelligence (AI), Conversational AI came of age in 2010 with the launch of Apple's Siri. Conversational AI systems leveraged Natural Language Processing (NLP) to understand and converse with humans via speech and text. These systems have been deployed in sectors such as aviation, tourism, and healthcare. However, the application of Conversational AI in the architecture engineering and construction (AEC) industry is lagging, and little is known about the state of research on Conversational AI. Thus, this study presents a systematic review of Conversational AI in the AEC industry to provide insights into the current development and conduct a Focus Group Discussion to highlight challenges and validate areas of opportunities. The findings reveal that Conversational AI applications hold immense benefits for the AEC industry, but it is currently underexplored. The major challenges for the under exploration were highlighted and discusses for intervention. Lastly, opportunities and future research directions of Conversational AI are projected and validated which would improve the productivity and efficiency of the industry. This study presents the status quo of a fast-emerging research area and serves as the first attempt in the AEC field. Its findings would provide insights into the new field which be of benefit to researchers and stakeholders in the AEC industry. © 2022 The Author(s)	10.1016/j.aei.2022.101869	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145970612&doi=10.1016%2Faei.2022.101869&partnerID=40&md5=4b17f1dc1fa96dc83069f82c3b
V. Santa Barletta, Caivano, D., Colizzi, L., Dimarzio, G., Plattini, M.	Clinical-chatbot AHP evaluation based on "quality in use" of ISO/IEC 25010	INTERNATIONAL JOURNAL OF MEDICAL INFORMATICS	2023	170			Medical-chatbot quality, Clinical pathway, AHP, ISO, IEC 25010, HIERARCHY PROCESS, CRITERIA, DESIGN	Background: Conversational agents are currently a valid alternative to humans in first-level interviews with users who need information, even in-depth, about services or products. In application domains such as health care, this technology can become pervasive only if the perceived "quality in use" is appropriate. How to measure chatbot quality is an open question. The international standard ISO/IEC 25010 proposes a set of characteristics (effectiveness, efficiency, satisfaction, freedom from risk, and content coverage) to be considered when the "quality in use" of a software system has to be measured. Basic procedure: This study proposes a clinical chatbot comparison method based on quality. The proposed approach is based on Analytic Hierarchy Process methodology (AHP). Findings: Our contribution is twofold. First, we propose a set of measures for each characteristic of ISO/IEC 25010 according to three classes of functionality: providing information, providing prescriptions and process management. Moreover a quantitative method is proposed for making homogeneous the pairwise weights when the AHP is used for the "quality-in-use" comparison. As a case study, a comparison of two versions of a chatbot was performed. Conclusions: The results show that the proposed approach provides an effective reference base for performing quality comparisons of medical chatbots compliant with the ISO/IEC 25010 standard.	10.1016/j.ijmedinf.2022.104951	
A. Santosa, Tan, T., Roslan, N., Li, J.	Chatbots in SINGAPORE-SCREENING and triaging: Use of a multi-ethnic Asian population	International Journal of Rheumatic Diseases	2023	26	17-18		adult, arthritis, Asian, chatbot, conference abstract, consultation, female, health care system, human, Likert scale, major clinical study, male, mobile phone, musculoskeletal disease, outpatient department, patient education, patient satisfaction, patient triage, perception, physician, pilot study, primary health care, rheumatic disease, rheumatologist, rheumatology, Singapore, tablet computer	Background: AI-based conversational agents or chatbots have been used as digital healthcare interventions to deliver cost-efficient and personalized medical support. They have demonstrated benefits in disease diagnosis, monitoring and treatment support. In Asia, the availability of chatbots developed specifically for screening rheumatic conditions and delivering knowledge to people with rheumatic conditions is currently still lacking. In this pilot study, a regional healthcare system in Singapore set up a public-facing chatbot that allows users to use the symptom checker function to screen for potential systemic rheumatic diseases and musculoskeletal disorders. Patients with a moderate and high likelihood of systemic rheumatic conditions and inflammatory arthritides are advised on early presentation to a primary healthcare physician, which serves the purpose of validating screening and triaging by the chatbot and potential escalation for urgent specialist care. The study assesses the impact of the chatbot intervention by assessing the acceptance of the chatbot as a digital health intervention for screening, triaging and patient education. Methods: Patients who attended a rheumatology outpatient clinic were invited to participate in using the chatbot on mobile devices such as mobile phones or tablets before seeing their rheumatologist. The inclusion criteria were patients who could give consent, understand English, and are literate. At the end of the user experience, patients were requested to do a patient satisfaction survey, which included six questions measured on a Likert scale, 1 being Most Unsatisfied and 5 being Most Satisfied. A sample of the six questions is shown in Table 1. Survey results were analyzed. Results: One hundred fifty-one patients participated in the chatbot user experience. The overall user experience is positive, as all responses scored above 3. The top 3 patient satisfaction were: (1) the information presented on the chatbot was easy to understand, (2) they were comfortable with the use of chatbots to look up information before their consultation and (3) they will use the chatbot again if it allows them to find out the cause of their symptoms and how to manage them. Conclusion: A chatbot developed specifically for a multi-ethnic Asian population showed positive patient satisfaction after engagement with the chatbot. Future research will look into physician satisfaction and perception of change in behavior or practice due to the chatbot.	10.1111/1756-185X.14502	https://www.embase.com/search/results?subaction=viewrecord&id=t640243173&from=export,http://dx.doi.org/10.1111/1756-185X.14502
T. J. Sejnowski	Large Language Models and the Reverse Turing Test	Neural Comput	2023	35	3	309-342		Large language models (LLMs) have been transformative. They are pretrained foundational models that are self-supervised and can be adapted with fine-tuning to a wide range of natural language tasks, each of which previously would have required a separate network model. This is one step closer to the extraordinary versatility of human language. GPT-3 and, more recently, LaMDA, both of them LLMs, can carry on dialogs with humans on many topics after minimal priming with a few examples. However, there has been a wide range of reactions and debate on whether these LLMs understand what they are saying or exhibit signs of intelligence. This high variance is exhibited in three interviews with LLMs reaching widely different conclusions. A new possibility was uncovered that could explain this divergence. What appears to be intelligence in LLMs may in fact be a mirror that reflects the intelligence of the interviewer, a remarkable twist that could be considered a reverse Turing test. If so, then by studying interviews, we may be learning more about the intelligence and beliefs of the interviewer than the intelligence of the LLMs. As LLMs become more capable, they may transform the way we interact with machines and how they interact with each other. Increasingly, LLMs are being coupled with sensorimotor devices. LLMs can talk the talk, but can they walk the walk? A road map for achieving artificial general autonomy is outlined with seven major improvements inspired by brain systems and how LLMs could in turn be used to uncover new insights into brain function.	10.1162/neco_a_01563	

M. Y. Shado, Hama, R. S., Eisenhauer, C., Khazanchi, D., Pozehl, B.	Ask, 'When You Do This, How Much Pain Are You In?': Content Preferences for a Conversational Pain Self-Management Software Application	J Gerontol Nurs	2023	49	1	Nov 17	Humans, Female, Aged, Pain Management/methods, "Self-Management, Pain, Communication, "Mobile Applications	The purpose of the current study was to examine older adults' preferences for conversational pain management content to incorporate in an interactive application (app) for pain self-management. Conversational statements and questions were written as a script to encourage evidence-based pain self-management behaviors. The content was converted from text to female chatbot speech and saved as four groups of MP3 files. A purposive sample of 22 older adults participated in a guided interaction through the MP3 files. One-on-one interviews were conducted to garner participants' conversational content preferences. Overall, participants want the conversational content to increase health care provider engagement in pain management communication. Older adults preferred the inclusion of conversational statements and questions for monitoring the multifaceted dimensions of pain, treatment accountability, guidance for alternative treatments, and undesirable effects from pain treatments. The design of mobile health apps must incorporate the needs and preferences of older adults. [Journal of Gerontological Nursing, 49(1), 11-17.]	10.3928/00989134-202211205-04	
Y. Shen, Heacock, L., Elias, J., Hentel, K. D., Reig, B., Shih, G., Mny, I., A. Shigarov	ChatGPT and Other Large Language Models Are Double-edged Swords	Radiology	2023			230163			10.1148/radiol.230163	
	Table understanding: Problem overview	Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery	2023	13	1		table extraction, table interpretation, table mining, table recognition, Data mining, Knowledge based systems, Natural language processing systems, Semantics, Algorithmics, Natural language generation, Question Answering, Relational data, Table detection, Table understanding, Extraction	Tables are probably the most natural way to represent relational data in various media and formats. They store a large number of valuable facts that could be utilized for question answering, knowledge base population, natural language generation, and other applications. However, many tables are not accompanied by semantics for the automatic interpretation of the information they present. Table Understanding (TU) aims at recovering the missing semantics that enables the extraction of facts from tables. This problem covers a range of issues from table detection in document images to semantic table interpretation with the help of external knowledge bases. To date, the TU research has been ongoing on for 30 years. Nevertheless, there is no common point of view on the scope of TU; the terminology still needs agreement and unification. In recent years, science and technology have shown a rapidly increasing interest in TU. Nowadays, it is especially important to check the meaning of this research problem once again. This article gives a comprehensive characterization of the TU problem, including a description of its subproblems, tasks, subtasks, and applications. It also discusses the common limitations used in the existing problem statements and proposes some directions for further research that would help overcome the corresponding limitations. This article is categorized under: Algorithmic Development > Text Mining Algorithmic Development > Web Mining. © 2022 Wiley Periodicals LLC.	10.1002/widm.1482	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142414971&doi=10.1002%2Fwidm.1482&partnerID=40&md5=1b9767083c7164e9991e4c0059ef5748
C. Sinha, Meheli, S., Kadaba, M.	Understanding Digital Mental Health Needs and Usage With an Artificial Intelligence-Led Mental Health App (Wysa) During the COVID-19 Pandemic: Retrospective Analysis	JMIR Form Res	2023	7		e41913	Covid-19, chatbot, conversational agent, digital health intervention, digital mental health, engagement, mental health app, mobile health, pandemic waves, perceived needs, retention	BACKGROUND: There has been a surge in mental health concerns during the COVID-19 pandemic, which has prompted the increased use of digital platforms. However, there is little known about the mental health needs and behaviors of the global population during the pandemic. This study aims to fill this knowledge gap through the analysis of real-world data collected from users of a digital mental health app (Wysa) regarding their engagement patterns and behaviors, as shown by their usage of the service. OBJECTIVE: This study aims to (1) examine the relationship between mental health distress, digital health uptake, and COVID-19 case numbers; (2) evaluate engagement patterns with the app during the study period; and (3) examine the efficacy of the app in improving mental health outcomes for its users during the pandemic. METHODS: This study used a retrospective observational design. During the COVID-19 pandemic, the app's installations and emotional utterances were measured from March 2020 to October 2021 for the United Kingdom, the United States of America, and India and were mapped against COVID-19 case numbers and their peaks. The engagement of the users from this period (N=4541) with the Wysa app was compared to that of equivalent samples of users from a pre-COVID-19 period (1000 iterations). The efficacy was assessed for users who completed pre-post assessments for symptoms of depression (p=2061) and anxiety (n=1995) on the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) test measures, respectively. RESULTS: Our findings demonstrate a significant positive correlation between the increase in the number of installs of the Wysa mental health app and the peaks of COVID-19 case numbers in the United Kingdom (P=.02) and India (P<.001). Findings indicate that users (N=4541) during the COVID period had a significantly higher engagement than the samples from the pre-COVID period, with a medium to large effect size for 80% of these 1000 iterative samples, as observed on the Mann-Whitney test. The PHQ-9 and GAD-7 pre-post assessments indicated statistically significant improvement with a medium effect size (PHQ-9: P=.57, GAD-7: P=.56). CONCLUSIONS: This study demonstrates that emotional distress increased substantially during the pandemic, prompting the increased uptake of an artificial intelligence-led mental health app (Wysa), and also offers evidence that the Wysa app could support its users and its usage could result in a significant reduction in symptoms of anxiety and depression. This study also highlights the importance of contextualizing interventions and suggests that digital health interventions can provide large populations with scalable and evidence-based support for mental health care.	10.2196/41913	
E. D. Smith, Savage, S. K., Andrew, E., Hinton, H., Martin, G. M., Kahn-Kirby, A. H., LoTempio, J., Dilot, E., Cohen, A. J., Pitsava, G., Berger, S., Fusaro, V. A., Villain, E.	Development and Implementation of Novel Chatbot-based Genomic Research Consent	bioRxiv	2023					OBJECTIVE: To conduct a retrospective analysis comparing traditional human-based consenting to an automated chat-based consenting process. MATERIALS AND METHODS: We developed a new chat-based consent using our IRB-approved consent forms. We leveraged a pre-developed platform (Gis+) or "Genetic Information Assistant") to deliver the chat content to candidate participants. The content included information about the study, educational information, and a quiz to assess understanding. We analyzed 144 families referred to our study during a 6-month time period. A total of 37 families completed consent using the traditional process, while 35 families completed consent using Gis+. RESULTS: Engagement rates were similar between both consenting methods. The median length of the consent conversation was shorter for Gis+ users compared to traditional (44 vs. 76 minutes). Additionally, the total time from referral to consent completion was faster with Gis+ (5 vs. 16 days). Within Gis+, understanding was assessed with a 10-question quiz that most participants (96%) passed. Feedback about the chat consent indicated that 86% of participants had a positive experience. DISCUSSION: Using Gis+ resulted in time savings for both the participant and study staff. The chatbot enables studies to reach more potential candidates. We identified five key features related to human-centered design for developing a consent chat. CONCLUSION: This analysis suggests that it is feasible to use an automated chatbot to scale obtaining informed consent for a genomics research study. We further identify a number of advantages when using a chatbot.	10.1101/2023.01.23.525221	
W. S. M. Sodré, Duarte, J. C.	Chatbot Optimization using Sentiment Analysis and Timeline Navigation	Revista de Informatica Teorica e Aplicada	2023	30	1	32-43	Chatbot, Framework, Sentiment Analysis, Timeline Tree	A chatbot or conversational agent is a software that can interact or "chat" with a human user using a natural language, like English, for instance. Since the first chatbot developed, many have been created but most of their problems still persist, like providing the right answer to the user and user acceptance itself. Considering such facts, in this work, we present a chatbot-building framework that considers the use of sentiment analysis and tree timelines to provide a better chatbot answer. For instance, as presented in our experiments, the user can be addressed to a human attendant when its sentiment is very negative, or even try another branch of the tree timeline, as an alternative answer, whenever the user sentiment is less negative. © 2023, Federal University of Rio Grande do Sul, Institute of Informatics. All rights reserved.	10.22456/2175-2745.125825	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147367897&doi=10.22456%2F2175-2745.125825&partnerID=40&md5=a192f85300675aafa499988c17220f6
A. L. Stanley, Edwards, T. C., Jaere, M. D., Lex, J. R., Jones, G. G.	An automated, web-based triage tool may optimise referral pathways in elective orthopaedic surgery: A proof-of-concept study	Digit Health	2023	9		2.1E+16	Orthopaedic, chatbot, computer-assisted diagnosis, digital health, e-triage, knee, medical informatics, screening, surgery, certifies that he or she has no commercial associations (e.g. Consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might, pose a conflict of interest in connection with the submitted article.	INTRODUCTION: Knee pain is caused by various pathologies, making evaluation in primary-care challenging. Subsequently, an over-reliance on imaging, such as radiographs and MRI exists. Electronic-triage tools represent an innovative solution to this problem. The aims of this study were to establish the magnitude of unnecessary knee imaging prior to orthopaedic surgeon referral, and ascertain whether an e-triage tool outperforms existing clinical pathways to recommend correct imaging. METHODS: Patients ≥18 years presenting with knee pain treated with arthroscopy or arthroplasty at a single academic hospital between 2015 and 2020 were retrospectively identified. The timing and appropriateness of imaging were assessed according to national guidelines, and classified as 'necessary', 'unnecessary' or 'required MRI'. Based on an eDelphi consensus study, a symptom-based e-triage tool was developed and piloted to preliminarily diagnose five common knee pathologies and suggest appropriate imaging. RESULTS: 1462 patients were identified. 17.2% (n = 132) of arthroplasty patients received an 'unnecessary MRI'. 27.6% (n = 152) of arthroscopy patients did not have a 'necessary MRI', requiring follow-up. Forty-one patients trialled the e-triage pilot (mean age: 58.4 years, 58.5% female). Preliminary diagnoses were available for 33 patients. The e-triage tool correctly identified three of the four knee pathologies (one pathology did not present). 79.2% (n = 19) of participants would use the tool again. CONCLUSION: A substantial number of knee pain patients receive incorrect imaging, incurring delays and unnecessary costs. A symptom-based e-triage tool was developed, with promising performance and user feedback. With refinement using larger datasets, this tool has the potential to improve wait-times, referral quality and reduce cost.	10.1177/20552076231152177	
C. Stokel-Walker	ChatGPT listed as author on research papers: many scientists disapprove	Nature	2023	613	7945	620-621	*Authorship, *Publishing/legislation & jurisprudence/trends, *Artificial Intelligence/Legislation & jurisprudence/trends, *Research Report/standards/trends, Ethics, Publishing		10.1038/641586-023-00107-z	
C. Stokel-Walker, Van Noorden, R.	What ChatGPT and generative AI mean for science	Nature	2023	614	7947	214-216	*Algorithms, *Artificial Intelligence/trends, *Science/methods/trends, Machine learning, Mathematics and computing, Publishing		10.1038/641586-023-00340-6	
C. Stokel-Walker	AI chatbots are coming to search engines – can you trust the results?	Nature	2023				Human behaviour, Information technology, Technology		10.1038/641586-023-00423-4	
C. Stokel-Walker	AI chatbots are coming to search engines – can you trust the results?	Nature	2023				chatbot, information technology, note, search engine, trust		10.1038/641586-023-00423-4	https://www.embase.com/search/results?subaction=viewrecord&id=2021594519&from=export , http://dx.doi.org/10.1038/641586-023-00423-4
H. Strobel, Webson, A., Sanh, V., Hoover, B., Beyer, J., Pfister, H., Rush, A. M.	Interactive and Visual Prompt Engineering for Ad-hoc Task Adaptation with Large Language Models	IEEE Transactions on Visualization and Computer Graphics	2023	29	1	1146-1156	language modeling, Natural language processing, zero-shot models, Computational linguistics, Job analysis, Natural language processing systems, Visual languages, Zero-shot learning, Computational modelling, language model, Language processing, Natural languages, Task analysis, Transformer, Zero-shot model, Modeling languages	State-of-the-art neural language models can now be used to solve ad-hoc language tasks through zero-shot prompting without the need for supervised training. This approach has gained popularity in recent years, and researchers have demonstrated prompts that achieve strong accuracy on specific NLP tasks. However, finding a prompt for new tasks requires experimentation. Different prompt templates with different wording choices lead to significant accuracy differences. PromptIDE allows users to experiment with prompt variations, visualize prompt performance, and iteratively optimize prompts. We developed a workflow that allows users to iteratively optimize prompts using small data before moving on to a larger data regime that allows empirical grounding of promising prompts using quantitative measures of the task. The tool then allows easy deployment of the newly created ad-hoc models. We demonstrate the utility of PromptIDE (demo: http://prompt.vihub.ai) and our workflow using several real-world use cases. © 2022 IEEE.	10.1109/TVCG.2022.3209479	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85139820048&doi=10.1109%2FTVCG.2022.3209479&partnerID=40&md5=1c5dc20bc484231d089346dc579216d6f

Q. Suissa, Zhitomirsky-Geffet, M., Elmaleh, A.	Question answering with deep neural networks for semi-structured heterogeneous genealogical knowledge graphs	SEMANTIC WEB	2023	14	2	209-237	Question answering, genealogy, neural networks, knowledge graph, natural language processing, Transformers, cultural heritage, NATURAL LANGUAGE GENERATION, PERFORMANCE, HISTORY	With the rising popularity of user-generated genealogical family trees, new genealogical information systems have been developed. State-of-the-art natural question answering algorithms use deep neural network (DNN) architecture based on self-attention networks. However, some of these models use sequence-based inputs and are not suitable to work with graph-based structure, while graph-based DNN models rely on high levels of comprehensiveness of knowledge graphs that is nonexistent in the genealogical domain. Moreover, these supervised DNN models require training datasets that are absent in the genealogical domain. This study proposes an end-to-end approach for question answering using genealogical family trees by: (1) representing genealogical data as knowledge graphs, (2) converting them to texts, (3) combining them with unstructured texts, and (4) training a transformer-based question answering model. To evaluate the need for a dedicated approach, a comparison between the fine-tuned model (Uncle-BERT) trained on the auto-generated genealogical dataset and state-of-the-art question-answering models was performed. The findings indicate that there are significant differences between answering genealogical questions and open-domain questions. Moreover, the proposed methodology reduces complexity while increasing accuracy and may have practical implications for genealogical research and real-world projects, making genealogical data accessible to experts as well as the general public.	10.3233/JW-222925	
W. Sung	More Than Just a Memory American Artist's "Sandy Speaks," Black Digitalities of Care, and the Politics of Technological Refusal	Feminist Media Histories	2023	9	1	123-143	African American histories, American Artist, Black technologies, care, chatbot, digital art, digital media, failure, police violence, race, Sandra Bland, Surveillance, Technology, The Green Book, violence	This article examines American Artist's installation "Sandy Speaks," a chatbot inspired by Sandra Bland's media activism, as an analytical connective point to pathways of Black technological critique and histories of Black digitality and care. First connecting the work to its predigital antecedent The Negro Green Book, the article then argues that the typical aspirations of chatbot to approximate the human is disavowed in "Sandy Speaks," enacting a Black technological critique of the human itself. Moreover, departing from celebratory discourses of Black technological innovation, the chatbot's low AI instantiates what the author calls a politics of technological refusal - a praxis of deliberate technological limitation as critique. This article asks what might happen when we seek potentialities of Black praxis in the slow, broken, old, technological forms, not as remedy, but as theory, critique, and an undoing of the recuperation of technological innovation as most legible mode of recognition. © 2023 by the Regents of the University of California. All rights reserved.	10.1525/fmh.2023.9.1.123	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147938807&doi=10.1525/fmh.2023.9.1.123&partnerID=40&md5=ba908ae823545f95973d5c379751a04
Y. W. Sung, Park, D. S., Kim, C. G.	A Study of BERT-Based Classification Performance of Text-Based Health Counseling Data	CMES- COMPUTER MODELING IN ENGINEERING & SCIENCES	2023	135	1	795-808	BERT, NLP, deep learning, healthcare, machine learning	The entry into a hyper-connected society increases the generalization of communication using SNS. Therefore, research to analyze big data accumulated in SNS and extract meaningful information is being conducted in various fields. In particular, with the recent development of Deep Learning, the performance is rapidly improving by applying it to the field of Natural Language Processing, which is a language understanding technology to obtain accurate contextual information. In this paper, when a chatbot system is applied to the healthcare domain for counseling about diseases, the performance of NLP integrated with machine learning for the accurate classification of medical subjects from text-based health counseling data becomes important. Among the various algorithms, the performance of Bidirectional Encoder Representations from Transformer was compared with other algorithms of CNN, RNN, LSTM, and GRU. For this purpose, the health counseling data of Naver Q&A service were crawled as a dataset. KoBERT was used to classify medical subjects according to symptoms and the accuracy of classification results was measured. The simulation results show that KoBERT model performed high performance by more than 5% and close to 18% as large as the smallest.	10.32604/cmes.2022.022465	
T. Tan, Santosa, A., Rozlan, N. L. J.	The development of an AI-based conversational agent for screening of rheumatic diseases	International Journal of Rheumatic Diseases	2023	26		333	autoantibody, endogenous compound, adult, arthritis, Asia, Asian, chatbot, conference abstract, decision support system, female, health care system, human, male, musculoskeletal disease, outcome assessment, patient care, patient referral, patient triage, physical disability, physician, pilot study, primary health care, rheumatic disease, rheumatologist, rheumatology, satisfaction, scoring system, Singapore	Background: Rheumatic diseases are among the leading causes of physical disability worldwide.1 Timely assessment and early treatment of rheumatic diseases improves functional outcome of patients.2 AI-based conversational agents or chatbots, have been used as digital healthcare interventions to potentially improve access to healthcare and help to manage the increasing demand for health services.3 In Asia, the availability of chatbots specifically developed for screening rheumatic conditions and delivering knowledge to people with rheumatic conditions are currently lacking. Methods: In this pilot study, a regional healthcare system in Singapore setup a web-based chatbot that has multiple functions: (1) The symptom checker function allows users to answer a series of questions to screen for rheumatic diseases and musculoskeletal disorders, and subsequently triages the user to seek urgent or non-urgent medical appointment (2) The health advice function provides instant responses to questions on rheumatic diseases, medications and common enquiries on autoantibodies. (3) The healthcare resource-related enquiry function provides assistance for enquiries on medication refill and appointment scheduling. The online symptom checker function adopted a dual-method of screening and diagnosis of rheumatic disease: patients who have been assessed to have moderate and high likelihood of systemic rheumatic conditions and inflammatory arthritides on the chatbot are advised to present to primary healthcare physician, who will validate the screening and triaging by the chatbot and refer to specialist care as required. The initial scoring system was constructed by 3 rheumatologists involved in the design of the chatbot. The scoring system deployed in the chatbot was adapted from the current classification criteria of rheumatic diseases published by American College of Rheumatology and European Alliance of Associations for Rheumatology. The aim of this pilot study was to test the user acceptance of this comprehensive digital diagnostic decision support systems tailored for a multi-ethnic Asian population. Results: The chatbot, named RheumConnect, is hosted on https://www.zgh.com.sg/patient-care/specialties-services/rheumatology Screen still pictures of the chatbot are illustrated in Figure 1. Conclusion: A chatbot was developed for a multi-ethnic Asian population for the purpose of reviewing symptoms of possible rheumatological conditions, online self-referral and provide instant responses to health enquiries. Future research will look into user acceptance, physician satisfaction and validation of the digital diagnostic decision support system in individuals suspecting a rheumatic disease.	10.1111/1756-185X.14505	https://www.embase.com/search/results?subaction=viewrecord&id=L640242766&from=export,http://dx.doi.org/10.1111/1756-185X.14505
G. Tang	Letter to editor: Academic journals should clarify the proportion of NLP-generated content in papers	Account Res	2023		01. Feb	ChatGPT, Misconduct in research, NLP system, Research ethics, Research integrity		This letter to the editor argues that if academic journals are willing to accept papers that include NLP-generated content under certain conditions, editorial policies should clarify the proportion of NLP-generated content in the paper. Excessive use of NLP-generated content should be considered as academic misconduct.	10.1080/08989621.2023.2180359	
H. The Lancet Digital	ChatGPT: friend or foe?	Lancet Digit Health	2023						10.1016/j2589-7500(23)00023-7	
H. H. Thorp	ChatGPT is fun, but not an author	Science	2023	379	6630	313		In less than 2 months, the artificial intelligence (AI) program ChatGPT has become a cultural sensation. It is freely accessible through a web portal created by the tool's developer, OpenAI. The program—which automatically creates text based on written prompts—is so popular that it's likely to be "at capacity right now" if you attempt to use it. When you do get through, ChatGPT provides endless entertainment. I asked it to rewrite the first scene of the classic American play Death of a Salesman, but to feature Princess Elsa from the animated movie Frozen as the main character instead of Willy Loman. The output was an amusing conversation in which Elsa—who has come home from a tough day of selling—is told by her son Happy, "Come on, Mom. You're Elsa from Frozen. You have ice powers and you're a queen. You're unstoppable." Mash-ups like this are certainly fun, but there are serious implications for generative AI programs like ChatGPT in science and academia.	10.1126/science.adg7879	
S. Tripathy, Singh, R., Ray, M.	Natural Language Processing for Covid-19 Consulting System	Procedia Comput Sci	2023	218		1335-1341	Nlp, covid-19, dialogue system, sequence-to-sequence, transformer	The world was taken aback when the Covid-19 pandemic hit in 2019. Ever since precautions have been taken to prevent the spreading or mutating of the virus, but the virus still keeps spreading and mutating. Scientists predict that the virus is going to stay for a long time but with reduced effectiveness. Recognizing the symptoms of the virus is essential in order to provide proper treatment for the virus. Visiting hospitals for consultation becomes quite difficult when people are supposed to maintain social distancing. Recently neural network generative models have shown impressive abilities in developing chatbots. However, using these neural network generative models that lack the required Covid specific knowledge to develop a Covid consulting system makes them difficult to be scaled. In order to bridge the gap between patients and a limited number of doctors we have proposed a Covid consulting agent by integrating the medical knowledge of Covid-19 with the neural network generative models. This system will automatically scan patient's dialogue seeking for a consultation to recognise the symptoms for Covid-19. The transformer and pretrained systems of BERT-GPT and GPT were fine-tuned CovidDialog-English dataset to generate responses for Covid-19 which were doctor-like and clinically meaningful to further solve the problem of the surging demand for medical consultations compared to the limited number of medical professionals. The results are evaluated and compared using multiple evaluation metrics which are BLEU-n, perplexity, BLEU-n, METEOR, Entropy-n and Dis-n. In this paper, we also hope to prove that the results obtained from the automated dialogue systems were significantly similar to human evaluation. Furthermore, the evaluation shows that state-of-the-art BERT-GPT performs better.	10.1016/j.procs.2023.01.112	
P. Tsigaris, Teixeira da Silva, J. A.	Can ChatGPT be trusted to provide reliable estimates?	Account Res	2023		01. Mrz	Artificial intelligence (AI), ethics, knowledge, transparency, trust			10.1080/08989621.2023.2179919	
A. Tuomi, Ascensão, M. P.	Intelligent automation in hospitality: exploring the relative automatability of frontline food service tasks	Journal of Hospitality and Tourism Insights	2023	6	1	151-173	Artificial intelligence, Chatbot, Conversational agent, First principle, Food service, Intelligent automation, Service robot	Purpose: Automation poses to change how service work is organized. However, there is a lack of understanding of how automation influences specific sectors, including specific hospitality jobs. Addressing this gap, this paper looks at the relative automatability of jobs and tasks which fall within one specific hospitality context: frontline food service. Design/methodology/approach: Study 1 analyses the UK Office for National Statistics' Standard Occupational Classification (2020) data to determine the degree to which frontline food service jobs consist of tasks requiring mechanical, analytical, intuitive or empathetic intelligence. Study 2 contrasts these findings to current state of intelligent automation technology development through interviews and a focus group with food service technology experts (n = 13). Findings: Of all the tasks listed under food service in the ONS SOC 2020, 58.8% are found to require mechanical, 26.8% analytical, 11.3% intuitive and 3.1% empathetic intelligence. Further, the automatability of these tasks is found to be driven by three streams of technology development in particular: (1) autonomous navigation, (2) object manipulation and (3) natural language processing. Originality/value: Hospitality management literature has started to conceptualize a move from mechanical and analytical service tasks to tasks centered around intuition and empathy. While previous studies have adopted a general view to what this might mean for hospitality jobs, this paper develops a novel, task-centric framework for Actioning Intelligent Automation in Frontline Food Service. © 2021, Emerald Publishing Limited.	10.1108/JHT-07-2021-0175	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85118970668&doi=10.1108/JHT-07-2021-0175&partnerID=40&md5=171980f54ba16498048e1989a51aa5f7
E. A. M. van Dis, Bollen, J., Zuidema, W., van Rooij, R., Bockting, C. L.	ChatGPT: five priorities for research	Nature	2023	614	7947	224-226	*Machine Learning/trends, *Writing/standards, *Research/standards/trends, Computer science, Machine learning, Publishing, Research management		10.1038/041586-023-00288-7	
A. Vázquez, López Zorrilla, A., Olaso, J. M., Torres, M. I.	Dialogue Management and Language Generation for a Robust Conversational Virtual Coach: Validation and User Study	Sensors (Basel)	2023	23	3		Humans, Aged, *Language, *Communication, Man-Machine Systems, Motor Vehicles, France, artificial intelligence, human-machine interaction, natural language generation, spoken dialogue systems, user study, virtual coaching, personal relationships that could have appeared to influence the work reported in, this paper.	Designing human-machine interactive systems requires cooperation between different disciplines is required. In this work, we present a Dialogue Manager and a Language Generator that are the core modules of a Voice-based Spoken Dialogue System (SDS) capable of carrying out challenging, long and complex coaching conversations. We also develop an efficient integration procedure of the whole system that will act as an intelligent and robust Virtual Coach. The coaching task significantly differs from the classical applications of SDSs, resulting in a much higher degree of complexity and difficulty. The Virtual Coach has been successfully tested and validated in a user study with independent elderly, in three different countries with three different languages and cultures: Spain, France and Norway.	10.3390/s23031423	

J. Wang, Tanes-Ehle, Z.	Examining the Effects of Conversational Chatbots on Changing Conspiracy Beliefs about Science: The Paradox of Interactivity	JOURNAL OF BROADCASTING & ELECTRONIC MEDIA	2023	67	1	68-89	PERSUASION, HEALTH, NEED, RESISTANCE, CLOSURE, SCALE	Conspiracy beliefs are commonly seen during times of uncertainty. This study examined whether a chatbot offering counter-conspiracy information can mitigate conspiracy beliefs and the role of chatbot empathy on its effectiveness. We conducted an online experiment in two different contexts (climate change vs. Covid-19) (N = 189). The results showed that as for Covid-19, participants who interacted with the chatbot with less empathetic expressions showed fewer changes in conspiracy beliefs than those who read the scientific news article. Regarding climate change, a chatbot with more empathetic expressions was more effective in changing conspiracy beliefs than an article, but only for people who can tolerate ambiguity.	10.1080/08838151.2022.2153842	
Y. Wang, Qin, Y., Deng, D., Wei, J., Zhou, Y., Fan, Y., Chen, T., Sun, H., Liu, L., Wei, S., Yin, S.	An Energy-Efficient Transformer Processor Exploiting Dynamic Weak Relevance in Global Attention	IEEE Journal of Solid-State Circuits	2023	58	1	227-242	Approximate computing, out-of-order computing, processor, self-attention, speculating, Transformer, Artificial intelligence, Computer hardware, Energy efficiency, Energy utilization, Green computing, Natural language processing system, Sports, Computational modelling, Out of order, Technological innovation, Convolution	Transformer-based models achieve tremendous success in many artificial intelligence (AI) tasks, outperforming conventional convolution neural networks (CNNs) from natural language processing (NLP) to computer vision (CV). Their success relies on the self-attention mechanism that provides a global rather than local receptive field as CNNs. Despite its superiority, the global-level self-attention consumes ~100x more operations than CNNs and cannot be effectively handled by the existing CNN processor due to the distinct operations. It inspires an urgent requirement to design a dedicated Transformer processor. However, global self-attention involves massive naturally existent weakly related tokens (WR-Tokens) due to the redundant contents in human languages or images. These WR-Tokens generate zero and near-zero attention results that introduce energy consumption bottlenecked, redundant computations, and hardware under-utilization issues, making it challenging to achieve energy-efficient self-attention computing. This article proposes a Transformer processor effectively handling the WR-Tokens to solve these challenges. First, a big-exact-small-approximate processing element (PE) reduces multiply-and-accumulate (MAC) energy for WR-Tokens by adaptively computing the small values approximately while computing the large values exactly. Second, a bidirectional asymptotical speculation unit captures and removes redundant computations of zero attention outputs by exploiting the local property of self-attention. Third, an out-of-order PE-line computing scheduler improves hardware utilization for near-zero values by reordering the operands to dovetail two operations into one multiplication. Fabricated in a 28-nm CMOS technology, the proposed processor occupies an area of 6.82 mm ² . When evaluated with a 90% of approximate computing for the generative pre-trained transformer 2 (GPT-2) model, the peak energy efficiency is 27.56 TOPS/W under 0.56 V at 50 MHz, 17.66x higher than A100 graphics processing unit (GPU). Compared with the state-of-the-art Transformer processor, it reduces energy by 4.57x and offers 3.73x speedup. © 2022 IEEE.	10.1109/JSSC.2022.3213521	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85141457304&doi=10.1109/JSSC.2022.3213521&partnerID=40&md5=43e62b07207a01858f05e6c40507ee2
R. Weeks, Sangha, P., Cooper, L., Sedoc, J., White, S., Gretz, S., Toledo, A., Lahav, D., Hartner, A. M., Martin, N. M., Lee, J. H., Slonim, N., Bar-Zeev, N.	Usability and Credibility of a COVID-19 Vaccine Chatbot for Young Adults and Health Workers in the United States: Formative Mixed Methods Study	JMIR Hum Factors	2023	10		e40533	Covid-19, chatbot, chatbot development, conversational agent, health information, natural language processing, risk communication, usability, user feedback, vaccine hesitancy	BACKGROUND: The COVID-19 pandemic raised novel challenges in communicating reliable, continually changing health information to a broad and sometimes skeptical public, particularly around COVID-19 vaccines, which, despite being comprehensively studied, were the subject of viral misinformation. Chatbots are a promising technology to reach and engage populations during the pandemic. To inform and communicate effectively with users, chatbots must be highly usable and credible. OBJECTIVE: We sought to understand how young adults and health workers in the United States assessed the usability and credibility of a web-based chatbot called Vira, created by the Johns Hopkins Bloomberg School of Public Health and IBM Research using natural language processing technology. Using a mixed method approach, we sought to rapidly improve Vira's user experience to support vaccine decision-making during the peak of the COVID-19 pandemic. METHODS: We recruited racially and ethnically diverse young people and health workers, with both groups from urban areas of the United States. We used the validated Chatbot Usability Questionnaire to understand the tool's navigation, precision, and persona. We also conducted 11 interviews with health workers and young people to understand the user experience, whether they perceived the chatbot as confidential and trustworthy, and how they would use the chatbot. We coded and categorized emerging themes to understand the determining factors for participants' assessment of chatbot usability and credibility. RESULTS: In all, 58 participants completed a web-based usability questionnaire and 11 completed in-depth interviews. Most questionnaire respondents said the chatbot was "easy to navigate" (51/58, 88%) and "very easy to use" (50/58, 86%), and many (45/58, 78%) said its responses were relevant. The mean Chatbot Usability Questionnaire score was 70.2 (SD 12.1) and scores ranged from 40.6 to 95.3. Interview participants felt the chatbot achieved high usability due to its strong functionality, performance, and perceived confidentiality and that the chatbot could attain high credibility with a redesign of its cartoonish visual persona. Young people said they would use the chatbot to discuss vaccination with hesitant friends or family members, whereas health workers used or anticipated using the chatbot to support community outreach, save time, and stay up to date. CONCLUSIONS: This formative study conducted during the pandemic's peak provided user feedback for an iterative redesign of Vira. Using a mixed method approach provided multidimensional feedback, identifying how the chatbot worked well-being easy to use, answering questions appropriately, and using credible branding while offering tangible steps to improve the product's visual design. Future studies should evaluate how chatbots support personal health decision-making, particularly in the context of a public health emergency, and whether such outreach tools can reduce staff burnout. Randomized studies should also be conducted to measure how chatbots countering health misinformation affect user knowledge, attitudes, and behavior.	10.2196/40533	
Z. Wei, Chen, Y., Zhao, Q., Zhang, P., Zhou, L., Ren, J., Piao, Y., Human, X., Wang, S., Liu, J., Zhang, D., Kadosh, R. C., Zhang, X.	Implicit Perception of Differences Between NLP-Produced and Human-Produced Language in the Mentalizing Network	Adv Sci (Weinh)	2023		e2203990	human language, implicit perception, mentalizing network, natural language processing	Natural language processing (NLP) is central to the communication with machines and among ourselves, and NLP research field has long sought to produce human-quality language. Identification of informative criteria for measuring NLP-produced language quality will support development of ever-better NLP tools. The authors hypothesize that mentalizing network neural activity may be used to distinguish NLP-produced language from human-produced language, even for cases where human judges cannot subjectively distinguish the language source. Using the social chatbots Google Meena in English and Microsoft Xiaoice in Chinese to generate NLP-produced language, behavioral tests which reveal that variance of personality perceived from chatbot chats is larger than for human chats are conducted, suggesting that chatbot language usage patterns are not stable. Using an identity rating task with functional magnetic resonance imaging, neuroimaging analyses which reveal distinct patterns of brain activity in the mentalizing network including the DMPFC and rTPJ in response to chatbot versus human chats that cannot be distinguished subjectively are conducted. This study illustrates a promising empirical basis for measuring the quality of NLP-produced language: adding a judge's implicit perception as an additional criterion.	10.1002/advsc.202203990		
W. Wlasak, Zwanenburg, S. P., Paton, C.	Supporting Autonomous Motivation for Physical Activity With Chatbots During the COVID-19 Pandemic: Factorial Experiment	JMIR Form Res	2023	7		e38500	Covid-19, autonomous motivation, chatbots, factorial experiment, mobile phone, physical activity, self-determination theory	BACKGROUND: Although physical activity can mitigate disease trajectories and improve and sustain mental health, many people have become less physically active during the COVID-19 pandemic. Personal information technology, such as activity trackers and chatbots, can technically converse with people and possibly enhance their autonomous motivation to engage in physical activity. The literature on behavior change techniques (BCTs) and self-determination theory (SDT) contains promising insights that can be leveraged in the design of these technologies; however, it remains unclear how this can be achieved. OBJECTIVE: This study aimed to evaluate the feasibility of a chatbot system that improves the user's autonomous motivation for walking based on BCTs and SDT. First, we aimed to develop and evaluate various versions of a chatbot system based on promising BCTs. Second, we aimed to evaluate whether the use of the system improves the autonomous motivation for walking and the associated factors of need satisfaction. Third, we explored the support for the theoretical mechanism and effectiveness of various BCT implementations. METHODS: We developed a chatbot system using the mobile apps Telegram (Telegram Messenger Inc) and Google Fit (Google LLC). We implemented 12 versions of this system, which differed in 3 BCTs: goal setting, experimenting, and action planning. We then conducted a feasibility study with 102 participants who used this system over the course of 3 weeks, by conversing with a chatbot and completing questionnaires, capturing their perceived app support, need satisfaction, physical activity levels, and motivation. RESULTS: The use of the chatbot systems was satisfactory, and on average, its users reported increases in autonomous motivation for walking. The dropout rate was low. Although approximately half of the participants indicated that they would have preferred to interact with a human instead of the chatbot, 46.1% (47/102) of the participants stated that the chatbot helped them become more active, and 42.2% (43/102) of the participants decided to continue using the chatbot for an additional week. Furthermore, the majority thought that a more advanced chatbot could be very helpful. The motivation was associated with the satisfaction of the needs of competence and autonomy, and need satisfaction, in turn, was associated with the perceived system support, providing support for SDT underpinnings. However, no substantial differences were found across different BCT implementations. CONCLUSIONS: The results provide evidence that chatbot systems are a feasible means to increase autonomous motivation for physical activity. We found support for SDT as a basis for the design, laying a foundation for larger studies to confirm the effectiveness of the selected BCTs within chatbot systems, explore a wider range of BCTs, and help the development of guidelines for the design of interactive technology that helps users achieve long-term health benefits.	10.2196/38500	
B. Yang, Sun, Y. Q., Shen, X. L.	Understanding AI-based customer service resistance: A perspective of defective AI features and tri-dimensional distrustful beliefs	INFORMATION PROCESSING & MANAGEMENT	2023	60	3		Artificial intelligence, Customer service, Empathy, Emotional intelligence, Customer resistance, USER RESISTANCE, INFORMATION-TECHNOLOGY, RECOMMENDATION AGENTS, PRODUCT RECOMMENDATIONS, PSYCHOLOGICAL CONTRACT, SPONSORSHIP DISCLOSURE, CONSUMERS ACCEPTANCE, MODERATING ROLE, SYSTEM QUALITY	Communicating with customers through AI-based chatbots in customer service (AISC) has become increasingly popular for many companies. However, in actual service encounters, AISC seems defective and is not always accepted by customers. Occasionally it is even resisted. This study aims to investigate such customer resistance. In addition to two cognition-centered AI features (i.e., irrelevant and biased information) discussed in prior studies, this study proposes that lack of empathy is another key feature of defective AI (i.e., in its emotional dimension) and investigates the underlying mechanism of empathy. Specifically, this study proposes three pathways in which empathy functions are lacking. A survey was conducted to test our hypotheses, and the results suggest that lack of empathy has three effects on customer resistance: direct, indirect, and moderating. Finally, theoretical contributions and practical implications are discussed.	10.1016/j.ipm.2022.103257	
S. J. H. Yang, Ogata, H., Matsui, T.	Guest Editorial: Human-centered AI in Education: Augment Human Intelligence with Machine Intelligence	EDUCATIONAL TECHNOLOGY & SOCIETY	2023	26	1	95-98	Human-centered AI, AI in education, Humanity, Sustainable education, Future learning, PRECISION EDUCATION	This special issue focus on underlying research with the use of human-centered AI (Artificial Intelligence), where the new design methods and tools can be leveraged and evaluated, hopes to advance AI research, education, policy, and practice to improve the human condition in education. This special issue intends to advocate an in-depth dialogue between researchers with diverse thoughts, genders, ethnicity, and cultures, as well as across disciplines, leading to a better understanding of human-centered AI. Beneficial interactions between researchers could enhance the adoption of human-centered AI in education. This special issue includes ten papers demonstrating how to augment human intelligence with machine intelligence. The ten papers feature human-centered AI in education, AI in language education, AI in learning analytics, ethical reasoning, AI in the clinical workplace, intelligent education robots, AI risk framework, intelligent course recommendation, education chatbots, and intelligent assessment. Together with the ten papers, we achieve a better understanding of the application of human-centered AI in education.	10.30191/ETS.202301_26(1).0007	
T. C. Yang, Chen, J. H.	Pre-service teachers' perceptions and intentions regarding the use of chatbots through statistical and lag sequential analysis	Computers and Education: Artificial Intelligence	2023	4			Educational chatbot, Learning behavior analysis, Pre-service teacher, Technology enhanced learning	Chatbots provide unique interactions with compatible learning system features, improving the limitations of current learning systems. Educational chatbots are seen as the future of technology integration in the field of education. The success and usefulness of chatbots in the educational setting are highly dependent on teachers' beliefs regarding their efficacy, yet most research focuses on the effects on students' learning. Only a few studies have investigated teachers' beliefs regarding the use of chatbots, which is considered an important issue. Owing to teachers' beliefs having been transformed from their pre-service teacher training, this study used quantitative (i.e., questionnaires), qualitative (i.e., interview), and evidence-based (i.e., behavioral analysis) methods to investigate pre-service teachers' learning perceptions and intentions about using chatbots for learning during their training phases. The results of this study revealed that learning perceptions did not reflect pre-service teachers' propensity to use chatbots, but the behavioral analysis uncovered some specific intentions for using chatbots. We further discuss these findings to provide recommendations for the future development of chatbots use in education. © 2022 The Authors	10.1016/j.caeai.2022.100119	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144578159&doi=10.1016/j.caeai.2022.100119&partnerID=40&md5=932e1baf56a6d11c0e280f12c549
N. S. L. Yeo-Teh, Tang, B. L.	Letter to editor: NLP systems such as ChatGPT cannot be listed as an author because these cannot fulfill widely adopted authorship criteria	Account Res	2023		01	Mz	Authorship, ChatGPT, Generative AI, ICMJE guidelines	This letter to the editor suggests adding a technical point to the new editorial policy expounded by Hosseini et al. on the mandatory disclosure of any use of natural language processing (NLP) systems, or generative AI, in writing scholarly publications. Such AI systems should naturally also be forbidden from being named as authors, because they would not have fulfilled prevailing authorship guidelines (such as the widely adopted ICMJE authorship criteria).	10.1080/08989621.2023.2177160	

H. Yildiz Durak	Conversational agent-based guidance: examining the effect of chatbot usage frequency and satisfaction on visual design self-efficacy, engagement, satisfaction, and learner autonomy	Education and Information Technologies	2023	28	1	471-488	Chatbots, Engagement, Guidance, Learner autonomy, Satisfaction, Visual design self-efficacy	Chatbots are tools that have the potential to effectively support interpersonal communication and interaction. Chatbots can provide great opportunities in education. The use of chatbots in education can be used to employ interactive methods, to provide learners information and different types of info, and to guide learners. Indeed, chatbots promise to enhance learning experiences by creating more interaction than traditional teaching practices provide. In this context, the purpose of this study is to apply chatbot technology as a guidance tool in educational environments and to model its effects on visual design self-efficacy, engagement, satisfaction, and learner autonomy at the end of the process. The participants of the study are 86 university students. In this study, data were collected with 4 different scales. Data were analyzed using the variance-based structural equation model with the partial least square method. As a result of the study, it was found that students with higher chatbot usage satisfaction had higher visual design self-efficacy. Chatbot usage satisfaction positively affects some aspects of course satisfaction. Chatbot usage satisfaction affects engagement. The effects of the study results in terms of research and practice were discussed. © 2022, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.	10.1007/s10639-022-11149-7	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85133279282&doi=10.1007/97810639-022-11149-7&partnerID=40&md5=c9bcae192438e0b7c5842a0dfb0806
C. S. Yu, Hsu, M. H., Wang, Y. C., You, Y. J.	Designing a Chatbot for Helping Parenting Practice	Applied Sciences (Switzerland)	2023	13	3		chatbot, infancy health education, LINE, parenting	In today's society, many families do not have children due to various reasons. The reasons include the pressure brought by childcare, and that double-income families do not have time to raise children, especially novice parents who will retreat. For this reason, we made a chatbot to solve problems. Through the questionnaires collected by our study, we found that most novice parents use INFANBOT when their children cry, thus, we used a baby's cry as an example here. When parents face a baby's cry, they can tap the button "burst into tears". The chatbot will immediately tell parents how to solve the problem. The authors designed a chatbot system named INFANBOT that combined the concepts of infancy health education to alleviate parents' troubles at work and parenting. It also reduced the anxiety of caregivers during the parenting process and gave them correct parenting knowledge. The INFANBOT is a real-time system that can provide real-time services to novice parents. Additionally, when the user is using INFANBOT, the system will record the problems encountered and invite the user to fill in a questionnaire at an appropriate time to improve the system. After a preliminary study, we found that INFANBOT can solve most of the problems encountered by users. Statistically, all respondents gave above 4.5 points in the Likert-type five-point scale. Therefore, most respondents felt that INFANBOT could solve their problems effectively and quickly. The INFANBOT system developed by this study is designed to meet the needs of users. The system design of INFANBOT established in this study met the needs of its users and can help users improve their parenting troubles. This study also has positive effects and contributions to society: 1. After using INFANBOT, users can effectively improve their knowledge of children's health education. 2. After using INFANBOT, users feel recognition of the professionalism of the health care knowledge provided by the robot, which can effectively improve the user's parenting problems. 3. Most of the users are satisfied with the positive results after using INFANBOT, so novice parents and parents who feel anxious about parenting can quickly search for common parenting problems on the LINE community software. © 2023 by the authors.	10.3390/app13031793	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147958421&doi=10.3390/app13031793&partnerID=40&md5=e3a4c51da22393ed4f4c36cf3f08186
H. Zeavin	Melancholic media: virtual reality, traumatic loss, and magic	Media, Culture and Society	2023	45	1	181-190	melancholic media, mourning and melancholia, racialized grief, spiritual media, the uncanny, trauma and media, virtual reality	This essay concerns itself with the status of 'melancholic media', or digital objects in psychic life after trauma on the grounds of three very different cases: Repika (a chatbot with avatar), Deep Nostalgia (the reanimating of family photographs), and Not the Only One (a noncommercial virtual agent). If for Freud, trauma is more than mind can endure; these surrogates both suggest concretization that which is being endured. Instead of directly confronting trauma and its overwhelm, these users might omnipotently reduce a literal figure of their loss. Rather than examining these human and non-human intrusions via the lens of the uncanny, I will return to the status of objects as melancholic media to think about psychic states in relationship to trauma and its multi-temporal aftermath. I trouble what these digital partial revivifications might do to and for psyches. © The Author(s) 2022.	10.1177/01634437221126062	https://www.scopus.com/inward/record.uri?eid=2-s2.0-851400325708&doi=10.1177/01634437221126062&partnerID=40&md5=831bb360409c235360378cc3c01e39ff
J. Zhang, Zhu, Y., Wu, J. F., Yu-Buck, G. F.	A natural apology is sincere: Understanding chatbots' performance in symbolic recovery	International Journal of Hospitality Management	2023	108			Chatbots, Emotional competence, Human-robot interaction, Lay belief, Symbolic recovery	Although chatbots have been widely used in dealing with service complaints, knowledge about the recovery performance of chatbots is limited. Drawing upon lay belief and emotional competence theory, this research explores symbolic recovery performances of chatbots in two experimental studies. The results show that symbolic recovery from chatbots leads to lower customer satisfaction than symbolic recovery from human employees due to the lay belief that chatbots lack emotional competence. Perceived naturalness and perceived sincerity play a sequential mediating role. Customers perceive chatbots' symbolic recovery to be less natural than that of human employees. Less natural recovery is perceived to be less sincere, thus decreasing customer satisfaction with the recovery. Changing perceived diagnosticity of the lay belief can improve customer satisfaction with chatbots' symbolic recovery. This research enriches theoretical research on symbolic recovery and chatbots, providing information for how companies can effectively use chatbots to make an appropriate recovery. © 2022 Elsevier Ltd	10.1016/j.ijhm.2022.103387	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85141981828&doi=10.1016/j.ijhm.2022.103387&partnerID=40&md5=00825501b49605d0571f079710f8e
J. M. Zhang, Zhu, Y. M., Wu, J. F., Yu-Buck, G. F.	A natural apology is sincere: Understanding chatbots' performance in symbolic recovery	INTERNATIONAL JOURNAL OF HOSPITALITY MANAGEMENT	2023	108			Chatbots, Symbolic recovery, Lay belief, Emotional competence, Human-robot interaction, ACCESSIBILITY-DIAGNOSTICITY, CUSTOMER SATISFACTION, SERVICE FAILURES, PERCEPTION, ROBOTS, INTELLIGENCE, EXPERIENCES, EMPLOYEES, EMPATHY	Although chatbots have been widely used in dealing with service complaints, knowledge about the recovery performance of chatbots is limited. Drawing upon lay belief and emotional competence theory, this research explores symbolic recovery performances of chatbots in two experimental studies. The results show that symbolic recovery from chatbots leads to lower customer satisfaction than symbolic recovery from human employees due to the lay belief that chatbots lack emotional competence. Perceived naturalness and perceived sincerity play a sequential mediating role. Customers perceive chatbots' symbolic recovery to be less natural than that of human employees. Less natural recovery is perceived to be less sincere, thus decreasing customer satisfaction with the recovery. Changing perceived diagnosticity of the lay belief can improve customer satisfaction with chatbots' symbolic recovery. This research enriches theoretical research on symbolic recovery and chatbots, providing information for how companies can effectively use chatbots to make an appropriate recovery.	10.1016/j.ijhm.2022.103387	
T. Zhao, Li, G., Song, Y., Wang, Y., Chen, Y., Yang, J.	A multi-scenario text generation method based on meta-reinforcement learning	Pattern Recognition Letters	2023	165		47-54	Meta-reinforcement learning, Multi-scenario, Natural language processing, Reinforcement learning, Text generation, Learning algorithms, Learning systems, Maximum likelihood estimation, Natural language processing systems, Generation method, Language processing, Multi scenarios, Natural language generation, Natural languages, Reinforcement learnings, Text generations	Multi-scenario text generation is an essential task in natural language generation because of the multi-scene interlaced property of real-world problems. Traditional methods typically train the multi-scenario text generation models based on maximum likelihood estimation, which will suffer from the problem of exposure bias. Reinforced learning (RL) is used in text generation methods could mitigate the exposure bias problem to some extent. However, the RL-based text generation methods are limited to the single-scenario tasks, which cannot be straightforwardly generalized to new scenario tasks. To address this problem, in this paper, we propose a multi-scenario text generation method based on meta RL (MetaRL-TG), which implements the method of model-agnostic meta-learning (MAML) in the framework of RL-based text generation. The proposed MetaRL-TG method first learns the initial parameters from multiple training tasks, then fine-tunes them in the target task. Thus, the proposed method is expected to efficiently achieve high-quality generated text in the new scenario. Finally, the effectiveness and generalization capability of the proposed method are demonstrated for eight scenarios through English text datasets. © 2022	10.1016/j.patrec.2022.11.031	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85145592137&doi=10.1016/j.patrec.2022.11.031&partnerID=40&md5=8b29204e3a7f80277019a500f21e0d35
X. L. Zhao, Chen, L., Jin, Y. C., Zhang, X. Z.	Comparing button-based chatbots with webpages for presenting fact-checking results: A case study of health information	INFORMATION PROCESSING & MANAGEMENT	2023	60	2		Health misinformation, Chatbot, User interface, Fact-checking, Conversational agent, User study, PERCEIVED USEFULNESS, CONTINUED INFLUENCE, VISUAL COMPLEXITY, USER ACCEPTANCE, COGNITIVE LOAD, PUBLIC-HEALTH, MISINFORMATION, TECHNOLOGY, IMPACT, PERFORMANCE	The unprecedented proliferation of online health misinformation poses a potential threat to public health. In recent times, several fact-checking organizations have adopted chatbots to present fact-checking results. However, it is unclear whether chatbots are more appropriate than traditional fact-checking websites for presenting these rigorous corrective messages. To answer this question, we compared a button-based chatbot with a traditional webpage for presenting fact-checking results. As fact-checkers' expertise cues could influence users' perception of fact-checking, we also considered the effect of expertise cues in our study. We conducted a 2 (interaction type: webpage vs. chatbot) × 2 (expertise cue: non-highlighted vs. highlighted) between-subjects online experiment (N = 308). The results show that the chatbot leads to higher perceived ease of use, which in turn increases the effectiveness of fact-checking. The highlighted expertise cue tends to decrease users' intention to use, especially when they interact with the webpage. Finally, we discuss the feasibility of using chatbots to disseminate fact-checking content and several design implications for the creation of an effective tool to fact-check health information.	10.1016/j.ipm.2022.103203	
Z. Zhao, Zhang, L., Lian, X., Gao, X., Lu, H., Shi, L.	ReqGen: Keywords-Driven Software Requirements Generation	Mathematics	2023	11	2		knowledge injection, requirements syntax, software requirements generation	Software requirements specification is undoubtedly critical for the whole software life-cycle. Currently, writing software requirements specifications primarily depends on human work. Although massive studies have been proposed to speed up the process via proposing advanced elicitation and analysis techniques, it is still a time-consuming and error-prone task, which needs to take domain knowledge and business information into consideration. In this paper, we propose an approach, named ReqGen, which can provide further assistance by automatically generating natural language requirements specifications based on certain given keywords. Specifically, ReqGen consists of three critical steps. First, keywords-oriented knowledge is selected from the domain ontology and is injected into the basic Unified pre-trained Language Model (UniLM) for domain fine-tuning. Second, a copy mechanism is integrated to ensure the occurrence of keywords in the generated statements. Finally, a requirements-syntax-constrained decoding is designed to close the semantic and syntax distance between the candidate and reference specifications. Experiments on two public datasets from different groups and domains show that ReqGen outperforms six popular natural language generation approaches with respect to the hard constraint of keywords' (phrases) inclusion, BLEU, ROUGE, and syntax compliance. We believe that ReqGen can promote the efficiency and intelligence of specifying software requirements. © 2023 by the authors.	10.3390/math11020332	https://www.scopus.com/inward/record.uri?eid=2-s2.0-851445761492&doi=10.3390/math11020332&partnerID=40&md5=5cba5625368097f4ca5d2a175788757000
D. Zhu, Lapshin, T., Rachidi, T.	Commentary generation for financial markets	EXPERT SYSTEMS WITH APPLICATIONS	2023	211			NLP, NLP, Text mining, Summarization, Financial markets, NATURAL-LANGUAGE GENERATION, OF- THE-ART, LINGUISTIC DESCRIPTIONS, AUTOMATIC-GENERATION	Financial markets are based on the daily movements of thousands of tradable assets, such as stocks, resulting in billion-dollar trade volumes and affecting investors and companies around the globe. In this volatile and high-stakes environment, financial-service firms employ analysts to create compact market commentaries that serve as insightful summaries with key pieces of information. In this work, we attempt to automate this process by formally defining and algorithmically solving the Market Commentary Generation (MCG) problem. In addition to saving time and cost via automation, our approach makes a number of contributions that differentiate it from previous related work. These include the consideration of thousands of underlying time series, the ability to capture and encode significant market events that involve multiple financial entities, and the ability to deliver high quality commentary even in the presence of small and unlabeled historical datasets. Finally, our approach takes into account the strict compliance requirements of the finance domain, which prevent the use of black-box methods that can produce language that violates key rules and regulations. We compare our work against competitive baselines via an evaluation that includes both qualitative and quantitative experiments.	10.1016/j.eswa.2022.118364	
C. Zielinski, Winkler, M., Aggarwal, R., Ferris, L., Heinemann, M., Lapshin, J. F., Pai, S., Ing, E., Citrome, L.	Chatbots, ChatGPT, and Scholarly Manuscripts: WAME Recommendations on ChatGPT and Chatbots in Relation to Scholarly Publications	Open Access Macedonian Journal of Medical Sciences	2023	11		83-86	article, chatbot, editor, human	Journals have begun to publish papers, in which chatbots such as ChatGPT are shown as coauthors. The following WAME recommendations are intended to inform editors and help them develop policies regarding chatbots for their journals, to help authors understand how use of chatbots might be attributed in their work, and address the need for all journal editors to have access manuscript screening tools. In this rapidly evolving field, we expect these recommendations to evolve as well.	10.3888/oamjms.2023.11502	https://www.eubase.com/search/results?subaction=viewrecord&id=12022624501&from=export,http://dx.doi.org/10.3888/oamjms.2023.11502
A. Zogaj, Mahner, P. M., Yang, L., Tschudin, D. K.	It's a Match! The effects of chatbot anthropomorphization and chatbot gender on consumer behavior	Journal of Business Research	2023	155			Anthropomorphism, Chatbot, Gender effects, Purchase intention, Self-concept, Self-congruence	Chatbots are increasingly used as substitutes for human service agents in online shops. This has led researchers to analyze how chatbot characteristics influence consumer responses. However, while the relevance of chatbot characteristics has been examined, to date, consumers' personalities have remained unattended in the research on this innovative mode of online support. Therefore, this study aims to understand how the interaction of consumer characteristics and chatbot characteristics influences consumer behavior. In doing so, we focus on how chatbots' visual cues (i.e., anthropomorphization, gender) influence consumer behavior while also considering consumers' self-concept. To answer the research question, we first conceptually discuss why consumer behavior depends on perceived self-congruence between consumers and a chatbot, which can be reached by anthropomorphizing chatbots and giving them the "right" gender. Subsequently, based on multiple studies, we empirically test the hypotheses considering male, female, and non-binary consumers. Our results demonstrate the relevance of both chatbot anthropomorphization and chatbot gender. © 2022 Elsevier Inc.	10.1016/j.jbusres.2022.113412	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85144294262&doi=10.1016/j.jbusres.2022.113412&partnerID=40&md5=23b90869f157870000748633db361