# An Overview of ChatGPT: Current Trends and Future Possibilities

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This study focuses on the perspective of artificial intelligence with the automation of data processing, the production of fresh insights, and virtual assistance to obtain new information, as we are aware of the potential of artificial intelligence (AI), which has changed the overall way of conducting research. The paper is an overview of various OpenAI-related research articles along with other products and applications in which open AI is currently working, like Gym, Robosumo, Debate Game, Generative Models (GPT, GPT2, GPT3), ChatGPT, Music, Whisper, Codex, and more. This paper aims to summarize various research articles for an overview of Chat GPT, a buzzword in the current market. Open AI developed an influential language model that has the potential to transform the way we interconnect with technology, and that powerful language model is termed a generative pre-trained transformer. The updated versions of GPT are GPT-2 and GPT-3, and ChatGPT based on the GPT-3 version. The ChatGPT model can comprehend and produce text that resembles human speech with astonishing accuracy since it has been trained on a vast database. The potential of ChatGPT to enhance natural language processing (NLP) and natural language understanding (NLU) in several applications is one of the most intriguing possibilities. The various applications of ChatGPT are in fields including academics, research domains, coding, education, healthcare, finance, the scientific community, etc. In this paper, we illustrate the recent trends and the future possibilities of how AI can reduce human effort and achieve maximum throughput in various aspects.

**Keywords**: OPENAI, Chat GPT, Natural Language Processing (NLP), Artificial Intelligence (AI), Generative Pre-training Transformer (GPT)

# 1. Introduction

The actual purpose of artificial intelligence is to reduce human effort and benefit humans in various sectors like Education, Research, Health, Banking, Software development, and many more. A general term used to describe the modeling of intelligent behavior by computers with little to no human input is artificial intelligence (AI). People considered the development of physical robots to be the beginning of artificial intelligence. [1]. Making intelligent devices, intelligent computer programs, is a scientific and engineering endeavor. Although it is related to the same aim of utilizing computers to comprehend human intellect, AI should not be limited to techniques that can be seen physiologically [2]. OpenAI is an artificial intelligence-basedresearch and deployment company that developed a Chatbot with artificial intelligence and was made available for the general public in November 2022. Both supervised and reinforcement learning techniques have helped to enhance it. The term GPT is the abbreviation for Generative Pre-defined Model. ChatGPT Chatbot is built by using the OpenAIGPT-3 language model. It is intended to produce text replies that sound like human responses to user input in a conversational setting. With the help of a vast dataset of human conversations, ChatGPT is specially trained to provide replies to a variety of themes. The chatbot may respond in many languages and is utilized for various tasks like customer support, content development, and language translation duties. The OpenAI API makes ChatGPT accessible, enabling programmers to use it and incorporate it into their systems and applications [4]. Since the 1950s, there has been discussion about chatbots, or computer programs intended to mimic communication with human users. Early chatbots had limited functionality and were only employed for straightforward tasks like giving weather updates or responding to simple queries. Yet, as chatbot technology has developed over time, it has been possible for them to comprehend and react to a greater variety of inputs. The modern chatbotGPT-3 was launched in 2020 and has 175 billion parameters, making it one of the vast language models. ChatGPT can produce text that resembles human speech in various circumstances since it was trained on a large amount of textual data. Applications for it include language translation, summarizing information, and answering questions. [5]The main focus of OpenAI's research is on Reinforcement Learning. There are many applications of OpenAI [6]. Some of them are:

**Generative Models-** These are categorized into some versions:

**GPT-**Alec Radford and his colleagues wrote the initial study on generative pre-training (GPT) of a language model, which was released as a preprint on OpenAI's website on June 11, 2018. It demonstrated how pre-training on a heterogeneous corpus with lengthy stretches of continuous text allows a generative model of language to gain world knowledge and understand long-range relationships.[7]

**GPT-2 -**The GPT-2 language model, developed by OpenAI in February 2019, uses unsupervised deep learning transformers to predict the next word or words in a phrase. The term "Generative Pre-trained Transformer 2" is abbreviated as GPT-2. To create the subsequent sequence of text for a particular sentence, the open-source model is trained on more than 1.5 billion parameters.[8]

**GPT-3 -**The third iteration of the "Generative Pre-Trained Transformer," or GPT-3, is an improved version of GPT-2. The GPT model is upgraded to a whole new level in version 3, thanks to its massive 175 billion parameter training set. GPT-3 was developed to be more robust than GPT-2 in that it can handle a wider range of topics, including responding to questions, composing essays, summarizing literature, translating languages, and creating computer code..[9]

**GPT-4 -** According to OpenAI, GPT-4 is "more trustworthy, imaginative, and capable of handling much more nuanced instructions than GPT-3." [35]. GPT-4 is more innovativeand team-oriented than ever. It can generate, revise, and refine writing jobs for both creative and technical audiences, including songwriting, screenwriting, and figuring out a user's writing style. It was first made available on March 14, 2023. [36] . As a transformer-based model, GPT-4 employs a paradigm in which pre-training utilizing both open-source data and "data licensed from third-party providers" is utilized to predict the next token. The model was then improved with reinforcement learning input from humans and AI for human alignment and policy compliance after this stage. [37]

**Codex-** GPT-3's immediate ancestor, OpenAI Codex, has been enhanced for programming jobs. Since it was trained on a data set with a far higher percentage of open-source code, OpenAI Codex has an extensive understanding of how people use code and is substantially more proficient than GPT-3 in code creation. [13] Code from 54 million GitHub repositories was used to train Codex, a descendant of GPT-3.[12]

**Gym-** Gym is a free and open-source toolkit that enables the development and comparison of reinforcement learning algorithms by offering a standardized API for interacting with various learning environments. Gym may only be used with Python as of June 2017. [10] The Gym documentation website was no longer being updated as of September 2017, and its GitHub page was the location of the current development.[11] API- OpenAI proposed a multipurpose API in June 2020 that would allow developers to use it for "any English-language AI job," including accessing new AI models that OpenAI has built. [14]. It offers our models a user-friendly, versatile, and powerful interface. When you provide a text prompt, the model will provide a text completion that makes an effort to match the context or pattern you provide. For example, enter a tagline for an ice cream business, and the API will respond with a completion like "We offer up smiles with every scoop!" [15]

**Robosumo-** A virtual environment called RoboSumo is used to create and test robotic control algorithms. It is a component of the OpenAI Gym toolbox, a set of settings and resources for creating and contrasting reinforcement learning algorithms. It was released in 2017 and features humanoid meta-learning robot agents that are assigned the objective of learning to move and eject the opposing agent from the ring. At first, they are unable to even walk. [16] When an agent is taken out of this virtual environment and placed in a different virtual environment with strong gusts, the agent braces to stay upright, indicating it has learned how to balance generically through this adversarial learning process. [17].

**ChatGPT-** An artificial intelligence product called ChatGPT, the world's most advanced chatbot, was introduced in November 2022 and is based on GPT-3. It has a conversational interface that enables users to ask queries in everyday language. The system then responds in a matter of seconds. Five days after its debut, ChatGPT had one million members. [18]. It differs from previous chatbots in that it can produce excellent text in a matter of seconds, sparking tremendous buzz and gloomy predictions. It was created to produce writing that can be mistaken for text authored by humans. It canconverse with users in a way that seems natural and logical. [19]. Built on top of the GPT-3 family of big language models from OpenAI, ChatGPT is customised using supervised and reinforcement learning methods. Unlike search engines (like Google, Bing, or Baidu), ChatGPT only knows items it learned before 2021 and does not sift through the web for information on current events. [20]. Compared to manual chats, ChatGPT can produce more accurate replies. This is because it has been trained on a sizable sample of conversational data, enabling it to comprehend conversational context and produce pertinent replies. [32].

## 2.    Literature Review

(Aydin, 2022) [21] Author discovered that ChatGPT improves the efficiency of research and produces literature reviews. In this paper, the author found that texts are produced using the keyword  −digital twin technology." These texts were used to compile the article's literature review. By using the phrase "Digital Twin in Healthcare" in a Google Scholar search, it finds papers from 2020 to 2022. Finally, using ChatGPT, the abstract of these studies was paraphrased. Following that, the matching rates of the research authors' writings in the plagiarism detection software were quite low. On the other hand, it was discovered that ChatGPT's responses to the queries posed were comparatively inadequate. Contrarily, the abstract paraphrase tests developed by ChatGPT have very good match rates. This evidence leads to the conclusion that, after paraphrasing, ChatGPT does not create original messages. This article serves as a stunning and lovely illustration of artificial intelligence to show where it has come from. Hence, it is concluded that ChatGPT has a wide role in the field of research. The whole work revolves around literature review, but it also needs further improvement to validate the citations of the research articles.

In this paper (Alshater, 2022) [22], the author finds that ChatGPT is used in the fields of economics and finance. ChatGPT can implement the analysis of large datasets and can be taught to analyse and interpret data. It can also be applied to find trends and patterns that people would not see right away. This is especially helpful in the financial industry, where data analysis is essential for making wise investment decisions. To outline the economic and financial data, ChatGPT produces reports. It is found that this technology, ChatGPT, also analyses the impacts on economic things like natural disorders, elections, and war. So, it can be said that ChatGPT improves accuracy in the fields of economics and finance.

(Elkins & Chun, 2020) [23], discovered that ChatGPT is used in the field of Content Generation. It has been used to produce articles, tales, and other written content, and some users have claimed that it is challenging to tell the difference between the generated text and human- authored writing. It has been demonstrated that ChatGPT can translate across languages with a high degree of accuracy and produce cohesive, illuminating summaries of lengthy materials. Ithas also been recommended that ChatGPT be used to automate the creation of repetitive or time- consuming content jobs, as well as to help authors and content creators come up with ideas and get beyond writer's block. Because of its capacity to produce believable and coherent writing, it has also garnered much interest and debate, raising questions about the possible applications and effects of AI in the field of language processing.

(Aljanabi et al., 2023) [24], found that ChatGPT plays an important role in the field of coding. ChatGPT-3 can interpret inputs in natural language. Instead of having to use specific terms or phrases, this enables developers to submit code snippets in the same manner they would discuss with a human. ChatGPT-3's capacity to deliver data relevant to the context is another benefit for coders. ChatGPT-3 can interpret the purpose of a question and deliver information that is specifically relevant to the code snippet or command being used, as opposed to merely returning a list of links or documentation. By giving developers the information they require more quickly and efficiently, this can save them time. ChatGPT-3 is an effective tool for code generation since it can also produce new code. As a result, developers work on complex projects with minimal effort. But there is also a drawback to the technology. Its price and accessibility are high, so small enterprises and individuals are unable to afford them, making it less accessible overall. Also, it cannot handle some queries, such as speed optimisation or debugging.

(O'Connor &ChatGPT, 2023) [25], With the ability to act as a search engine, ChatGPT-3 enables users to enter questions and obtain clear and meaningful results. It functions similarly to a search engine and can recognise and answer natural language inquiries. Through this method, users may input inquiries without having to use particular words or phrases, much like they would when asking a person a question. For many people, this may make the search process more simple and user-friendly. By delivering information that is related to the topic being asked rather than a list of links, ChatGPT-3 provides contextually relevant information. It gives the user the information they require more quickly and efficiently, which can save them time. ChatGPT-3 is a powerful tool for content generation since it can also produce new text. Businesses and organisations trying to provide interesting and educational content for their websites or social media platforms may find this to be particularly helpful. But there is also a drawback: it cannot handle mathematical calculations.

(M. Hammad, 2023) [26], Social media nowadays is used by almost everyone in today's world. It is an online web-based tool that allows users to interact, share ideas, and explore new things. ChatGPT plays an important role in this field. It is a useful tool for marketers, companies, and people. Marketers may enter particular inquiries or prompts for social media content using ChatGPT. For many people, this may make the process of creating material more simple and user-friendly. It offers data that is specifically relevant to social media. By giving them the information they want more quickly and efficiently, it may save marketers time. ChatGPT is an effective tool for developing interesting and educational social media postings since it may also provide fresh ideas. Businesses and organisations

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trying to produce social media content thatattracts their target audience may discover that this provides special help. It does not always provide accurate information, as it does not create hashtag strategies or identify trending topics.

(Korngiebel, 2021) [27], ChatGPT has worked in the important field of healthcare. Constant regular labour for providers might beneficially increase their job happiness and decrease the amount of time they spend dealing with computers, a well-documented worry. ChatGPT is an artificial intelligence (AI) tool that might help users traverse complicated electronic health record (EHR) systems, automatically match paperwork with human review, create orders, or automate other rote operations. Employing ChatGPT to help with screening non-critical patients who arrive at the emergency room may seem like a smart use of the technology from the perspective of both the patient experience and resource allocation. In this article, the emphasis will be on gathering correct data from patients in a user-friendly manner, thereby boosting patient care and the patient experience.

In this article, (Zhang et al., 2016) [28], The author discovered that ChatGPT also plays an important role in the field of stance detection techniques. Stance identification is the process of identifying a target's stance, such as favour, against, or neither, from a set of texts. The author of this report discovered that as social media content proliferates, this research is receiving more and more attention. In analytical research evaluating public opinion on social media, particularly on political and social matters, stance detection also plays a significant role. This method is also known as perspective and viewpoint identification, in which viewpoints are detected by expressing positions towards an item or a problematic issue. For NLP stance identification tasks, ChatGPT has the potential to be the best AI model. Moreover, ChatGPT provides the opportunity for the development of attitude detection-explaining AI.

Authors (Chintagunta&Amatriain, 2021) [29], In this model, it is explained that ChatGPT is used to summarise medical data for accuracy. It produces training information of excellent quality that can be combined with data that has been labelled by actual people to provide summaries that are significantly superior in terms of medical accuracy and coherence to those produced by models trained only on human input. In the field of healthcare, it is crucial to create low-shot models, or those that perform effectively with a limited set of labelled samples. Parallel to this, significant progress has been made in the creation of large-scale models that make use of web-scale data and exhibit strong low-shot performance, such as GPT. The summarizer must be skilled at precisely documenting all medical information (specified medicines, symptoms, etc.) and distinguishing both the good and negative sides of medical conditions (e.g., no allergies, having a cough for two days). Medical summarising requires a high degree of precision.

(Qadir& Al-Fuqaha, 2020) [30, 31], ChatGPT is also used in the field of education. The author of this article found that ChatGPT is used as a virtual tutor for students. It may be used to provide kids with a virtual smart instruction service where they can ask questions and get personalised responses and comments. The "Two Sigma Effect," which theories an average performance improvement of two standard deviations above those who get traditional training, shows that this personalised feedback-enabled iterative learning results in considerable learning gains. This effect is typically attributed to the ability of intelligent tutoring systems to provide rapid and frequent feedback, allowing students to gradually improve their knowledge and skills..

Author (OsmanovicThunström et al., 2022) [33] in this paper found another important field in which ChatGPT works. ChatGPT can generate academic papers and descriptions by itself. The Frequency Penalty technique, the Presence Penalty technique, and the Temperature setting are a few of the text-generation methods used by GPT-3. These methods are employed to manage the output that GPT-3 produces. It would enable GPT-3 to fully understand itself. It could be able to enhance its capabilities and performance as a result. It would also give insight into the operations and mental processes of

GPT-3. Researchers working to comprehend artificial intelligence more generally may find this to be helpful.

ChatGPT is a recent technology that is used almost in every field, whether in education, research, entertainment, sports, or many other places. In this paper, the author (İpek et al., 2023) [34] found that ChatGPT is used in the field of education. It can solve almost all the problems, including assignments, programming concepts, etc. Consequently, studies have been carried out in which ChatGPT was tested using university-level examinations in disciplines including law, medicine, language, and pharmacy.

In this article, researchers (Demirkol&Yirci, 2023) [38] found that ChatGPT 3 and ChatGPT 4 mark the positive and negative effects of COVID-19. One of the benefits they cited was how the COVID-19 process enabled instructors and students to work together to learn and try out new teaching techniques. Both ChatGPT iterations emphasised the value of health and well-being in the classroom, as well as the increased use of technology and the development of both teachers' and students' digital literacy during the pandemic.

## 3.     Conclusion & Future Possibilities

We conclude that ChatGPT is an extremely advanced and adaptable natural language processing technology with the potential to completely change the field of research. It is an essential tool for academics working as it can solve almost all the problems, including assignments, programming concepts, etc., because of its capacity to produce text that looks like human speech, analyse and understand data, and create simulations and scenarios. It can implement the analysis of large datasets and can be taught to analyse and interpret data and produce financial reports. It was found that ChatGPT was able to write content such as stories, scripts, and articles. ChatGPT is an effective tool for developing interesting and educational social media postings since it may also provide fresh ideas. ChatGPT is an effective tool for code generation since it can also produce new code. As a result, developers get their complex projects done with minimal effort. Although there are certain restrictions on the use of ChatGPT and other tools in research, including those related to generalizability, data quality, and domain knowledge, These skills have the potential to significantly increase research in several fields and lead to fresh ideas and discoveries that could completely change how we see the world. There are some challenges with ChatGPT, such assecurity worries and restricted functionality. Despite these challenges, ChatGPT is a potential AI technology that could be used to automate conversations and generate more accurate responses.

There are some future possibilities for ChatGPT. ChatGPT is used for writing literature reviews of research articles; it can be updated to validate citations of articles as well. It generates code snippets for developers, so it can be used for debugging the code and can handle speed optimisation in future updates. ChatGPT can be further improved to create an enhanced personal assistant who can schedule appointments and even offer personalised health advice. It can be updated to produce results in multimedia like images, videos, and audio. ChatGPT can be used as a personal tutor for on-demand educational support. It can also be used for counselling depressed patients. It is concluded that ChatGPT can be used in numerous other fields to provide support to humans.

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