Chatbots: a critical look into the future of the academia

Samuel Ariyo Okaiyeto[1], Arun S. Mujumdar[2], Parag Prakash Sutar[3], Wei Liu[4], Junwen Bai[5], Hongwei Xiao[1*]

(1. *College of Engineering, China Agricultural University, Beijing 100083, China;*
2. *Department of Bioresource Engineering, McGill University, Ste. Anne de Bellevue, Quebec, Canada;*
3. *Department of Food Process Engineering, National Institute of Technology Rourkela, Rourkela 769008, India;*
4. *School of Artificial Intelligence, Beijing University of Posts and Telecommunications, Beijing 100876, China;*
5. *School of Food and Biological Engineering, Jiangsu University, Zhenjiang 212013, China*)

Like every other societal domain, science faces yet another reckoning caused by a bot called ChatGPT (Chat Generative Pre-Trained Transformer). ChatGPT was introduced in November 2022 to produce messages that seem like they were written by humans and are conversational. With the release of the latest version of ChatGPT called GPT-4, and other similar models such as Google Bard, Chatsonic, Collosal Chat, these chatbots combine several (about 175 billion) neural networks pre-trained on large Language Models (LLMs), allowing them to respond to user promptings just like humans. GPT-4 for example can admit its mistakes and confront false assumptions thanks to the dialogue style, which also enables it to write essays and to keep track of the context of a discussion while it is happening. However, users may be deceived by the human-like text structure of the AI models to believe that it came from a human origin[1]. These chatbot models could be better, even though they generate text with a high level of accuracy. Occasionally, they produce inappropriate or wrong responses, resulting in faulty inferences or ethical issues. This article will discuss some fundamental strengths and weaknesses of this Artificial intelligence (AI) system concerning scientific research.

Chatbots have been used extensively for a while. While they can occasionally be helpful, especially in scientific research, it is well-known that they have several limits. In order to function, they rely on data gathered from various internet sources, some of which are of questionable trustworthiness. These sources also contain biases, such as those based on variations in gender, class, race/ethnicity, and age. Therefore, overreliance on the output of these AI generative tools could undermine the credibility of research work. When faced with ambiguous prompting, these models can generate responses that may not be accurate or consistent with reality. These responses are sometimes called *hallucinations.* While creating replies based on vast volumes of text data, language chatbot models use machine learning algorithms to evaluate and identify trends. These models frequently provide logical, consistent, and sometimes even convincing replies. However, they can occasionally produce absurd, damaging, or harmful reactions in specific contexts.

Some scientists use AI generative tools to summarize literature, write short paragraphs, create presentation slides, write essays, and edit manuscripts. According to [2], the technology will soon have the capacity to design experiments, draft, and complete manuscripts, perform peer review and even help in editorial decisions to reject or accept manuscripts. It is, therefore, crucial to remember that while tools like GPT-4 can support critical thinking and literature reviews, they should not be considered a replacement for these abilities. Before making decisions or coming to conclusions, users should constantly thoroughly assess the information they get, critically examine it, and consider various viewpoints and sources. Ultimately, the user must ensure that the information they obtain is reliable and qualitative. In the end, since scientific papers rely on human-generated data and interpretations, it will be challenging to duplicate the scientific story using AI-based language bots[3].

As an AI language model, Chatbot's responses are generated based on the data and patterns in the text it has been trained on. While the model strives to provide balanced and informative answers, it is limited by its programming capacity and inability to hold opinions or express disruptive concepts. Thereby exacerbating the challenge of declining disruptive works, a problem identified by Park et al.[4] At this stage, it is crucial to remember that the responses from these models serve informational purposes only, not to forward any particular opinion or agenda. Individuals are responsible for weighing the available data and formulating their judgments in light of their (users') values and beliefs.

Based frequently on an analysis of prior research and data, the consensus view of a field represents a snapshot of the current level of knowledge. These summaries can serve as a helpful starting point for academics, policymakers, and practitioners who want to comprehend the condition of a field today and the significant problems and difficulties it is now facing[3]. Nevertheless, these summaries could lack the insights required to recognize significant trends and opportunities for upcoming research and innovations if they are not supported by rigorous analysis and interpretation. It is crucial to stay current with research and think about the ramifications of new trends and technology to understand any field's possibilities properly. While these chatbots can be a helpful place to start when examining the general agreement on a topic, more is needed to replace the critical thinking and analysis required to advance a discipline.

The model may produce text similar to or identical to content protected by copyright, which raises a legal issue with possible

copyright infringement[5]. It is crucial to exercise caution while creating text using a language model to prevent copyright infringement. Ensuring the generated text is unique and does not violate current copyrights is crucial. Checking the generated content with plagiarism detection software or tools is one approach to achieve this. It is also critical to comprehend the restrictions imposed by language models and the legal ramifications of employing generated text. Before using created text for profit or posting it online, it is wise to get legal guidance.

The question arises, "Why would we, as academics, be eager to use or advertise this kind of product?"[6], a robot that can render us jobless? Mary Rasenberger, the CEO of 'authors guide', believes that using neural networks to create books is worth worrying about. According to van Dis et al.[2], one of the most immediate problems for the research community is the need for more transparency in the functionality of a chatbot. It is also difficult to verify the authenticity of any information obtained from this chatbot. Furthermore, the site has a history of being used for scams and frauds, which may lead to researchers' personal information being stolen and used for malicious purposes.

Academia must address the questions in the minds of its members about the nature of GPT-4 and other chatbots in the future world of researchers and writers. A regulatory gap may appear due to uncertainty raised by evolving technologies (7). Therefore, it is pertinent to set some rules that will guide the development of AI technology, within a controlled scope to seek advantages and avoid disadvantages, especially regarding scientific research. Prof. Russel of Berkeley has called for a moratorium on all AI models such as GPT-4, Google Bard AI, Chatsonic among others as ethical and moral restraints are agreed upon or legislated. According to him there is possibility that such programs can develop their own mind and may act in manner not intended by programmers. This is worrisome indeed. Addition, the potential harm of AI and its profound impact on human society should be clarified. For example, in a recent development, tech experts, including Elon Musk and Steve Wozniak have called for a pause in the development of AI systems for at least six months. The technology poses a dramatic risk to society unless proper oversight of the system development exists. In their recent letter, the tech industry leaders pose these existential questions "Should we develop non-human minds that might eventually outnumber, outsmart, obsolete, and replace us? Should we risk the loss of control of our civilization? The tech leaders noted that a six-month break would ensure that safety protocols are established. However, a more immediate concern is on jobs. According to David Solomon, the CEO of Goldman Sachs, an American multinational investment bank and financial services company, an equivalent of 300 million full-time jobs could be replaced by AI if necessary, regulations are not implemented.

Human-machine intelligence can handle the combination of logical and non-logical problems, since AI is better at handling them than humans are at handling logical ones. The notion of human-machine hybrid intelligence is concerned with the development of a novel kind of intelligence through interactions between humans, machines, and environments. Some advantages that could be obtained using human-machine hybrid intelligence over human intelligence and artificial intelligence include: a) A successful fusion of the objective data obtained from hardware sensors and the subjective data gleaned from human perception results in an intelligent input end; b) A new method of processing information that takes into account people's cognitive preferences and machine computing capacity; c) An organic and probabilistic optimization judgment is established by comparing the gradual iterative calculation's output end of intelligence to the value effect embedded in people's decision-making. People will deliberately consider inertial common-sense behaviour in the ongoing adaptation of human-machine integration, and machines will determine the difference in value weight from people's decisions under various circumstances. Effective human-machine hybrid intelligence integration into chatbots makeup will mean to bring users thoughts to chatbot, which signifies that users will begin to consciously think about the tasks they usually perform unconsciously, while the bot will begin to process the partners' personalized habits and preferences. These advantages when fully optimize will solve most of the ethical concerns and other problems currently associated with the use of AI generative tools.

This article is our position on GPT-4 and similar AI generative models; let the debate continue. It is worth noting that even in the scientific world, there are opposing views on the importance of AI technologies such as GPT-4 and other related models.

Acknowledgement

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