

ChatGPT and Large Language Models: Impact on the Integrity of Academic Publishing

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Large language models (LLM) or AI (Artificial Intelligence) systems play an implausible role in evaluating and creating intelligence today, than ever. The LLMs are based purely on language and are the power banks of chatbots such as ChatGPT, Microsoft's Bing Chat and Google's Bard.

The OpenAI, a research laboratory in San Francisco California, released ChatGPT (Generative Pre-trained Transformer), in November 2022. It uses natural language processing to generate responses to user inputs. ChatGPT embraced significant attention in no time (100 million users in first two months) (1), for its many potential uses with a wide range of language-related tasks, as well as trepidation about what its rise means to humankind (2).

Of its many functions, ChatGPT summarizes articles, reviews scientific literature, performs statistical analyses and writes scholarly manuscripts, furthermore, it identifies research gaps, designs experiments, and conducts peer-reviews (3). A recent report claims that ChatGPT generated 50 research abstracts from an existing research publication, gained acceptance by the plagiarism checker, an AI-output detector and human reviewers (4). In January 2023, *Nature* reported two published articles with ChatGPT as co-authors (5).

Even though the most advanced LLM behind ChatGPT has nailed many academic and professional language-based performances, a strong consideration shall be given to its assistance to scientific publications.

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Gonzalez et al., reports that ‘ChatGPT lacks the knowledge and expertise necessary to accurately and adequately convey complex scientific concepts and information’ (6). The creators of ChatGPT themselves have confessed that it is challenging to rectify the dilemma of ChatGPT writing seemingly coherent and credible, but incorrect or nonsensical text (7).

Validity of references and citations is crucial to ensure the quality and integrity of research. In its scholarly writing, when prompted to generate citations, ChatGPT may provide references that are incorrect or non-existent (8). Additionally, text without appropriate attribution pose a significant risk for researchers for unintentional plagiarism. ChatGPT can also be biased depending on the datasets that it navigates. The scope and quality of datasets that ChatGPT is trained on, may be skewed in terms of time, geography, people, gender, vulnerability etc. producing inequitable text (9). On one hand, the extensive use of ChatGPT in research and publishing these deceitful articles by predatory journals may add large amounts of pseudoscience into scholarly literature. On the other hand, it remains unclear that who is accountable and owns copyrights for the generated text (10). Moreover, there are rising concerns over ethical issues such as data privacy and confidentiality when using ChatGPT in research. All in all, it is evident that ChatGPT adversely impact on the integrity of academic publishing, undermining its fundamentals.

How exactly do LLMs perform as they do, is a question yet to be answered – even by their own creators. This is because the LLMs behaviour is acquired through training processes and not on command by programmers. The LLMs are fed with massive piles of text, from which they learn through trial and error to predict the words in sentences, sentences in paragraphs and paragraphs in essays. These models also refine their performances according to the feedback from human trainers.

Understanding the LLMs true extent of capabilities, strengths and weaknesses. and the underlying mechanisms that drive them, is imperative. For instance, recommendation of a medicine is brought about with the observed safety and efficacy in clinical trials and understanding the mechanism of action, which allows the clinicians to predict its response in different contexts. Likewise, unravelling the mechanisms of action that drive LLMs behaviour would allow researchers to predict its responses, hence, to select only the beneficial outcomes/tasks.

Further, in light of this awareness, editors of academic journals must now revise their editorial policies to address the challenges that LLMs pose to academic publishing.

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