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Artificial intelligence-driven disruption in science production ahead

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... Or maybe the first Editorial in the history of forest science written using (or should we say “with the coauthorship of”?) generative artificial intelligence.

Artificial intelligence (AI) and, in particular, generative AI based on large language models (LLM), and related applications such as the recently released ChatGPT by OpenAI, represent a disruptive technology that holds great potential to revolutionize science production in general and, of course, forest science in particular, too (<https://www.nature.com/articles/d41586-023-00191-1>). With the ability to analyze and interpret human language, such technologies can disrupt traditional research methods and allow researchers to analyze large volumes of data and report their findings more quickly and accurately than ever before.

The integration of such tools and methods in forest science production could significantly benefit the field by enhancing the quality of research papers and increasing the efficiency of the publication process. By assisting for instance the writing process of scientific manuscripts (e.g. as in this Editorial), or by helping data analysis through useful hints for code development in multiple programming languages, these technologies can help researchers save time and effort while (perhaps) improving the accuracy and precision of their work, also allowing researchers to better communicate their findings and insights.

However, the potential uninformed, unsupervised and uncritical misuse of these methods is raising many concerns among the scientific community and beyond. Indeed, despite the many potential benefits of AI and LLMs in science production, there are also serious challenges and ethical issues that must be addressed. For example, concerns have been already raised when it comes to acknowledging artificial authorship of scientific papers and technical reports, and the risk of passing off LLM-written manuscripts as text actually written by real scientists (<https://www.nature.com/articles/d41586-023-00107-z>). Another big concern relates to the risk of using AI and LLM tools in an oversimplistic way potentially leading to biased, unreliable or even completely wrong information (<https://www.nature.com/articles/d41586-023-00191-1>). For instance, when writing this Editorial, all the references to previous research on AI and natural language processing models in forest science that were provided automatically by ChatGPT upon request by the author of this Editorial were all actually non-existing in the literature. The suggested (wrong) references even included a DOI link which systematically pointed toward papers that, in reality, had absolutely different title and authors and were completely unrelated to the specific query and topic of research.

In short, the model “invented” non-existing references, while it failed at automatically finding and providing key, existing references (i.e. as the ones included here, which were selected directly by the Editor when writing the Editorial). Thus, an unsupervised, blind, use of AI tools in writing this Editorial would have resulted in a sort of scientific fraud.

In conclusion, LLMs have the potential to disrupt (forest) science writing and production in significant ways, enabling researchers to improve the quality and efficiency of our work. Most probably, current flaws and inconsistencies such as the ones described here may be addressed and corrected sooner or later through improved versions of the AI models. However, it is crucial that we carefully consider and address the many issues associated with this technology to ensure that its implementation is truly beneficial for all given the current, justified, serious concerns regarding the reliability, potential bias, accuracy and ethics of the information generated by LLMs.

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