

Viewpoint

Proposing authorship for artificial intelligence and large language models

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Abstract

The current and predominant school of thought in academic publishing, with a correspondingly rigorously implemented set of ethical policies, notes that classic authorship is a purely human endeavor. However, such rigid conceptual restrictions on authorship for artificial intelligence (AI), like large language models (LLMs), may be borne from fear, emerging perhaps from being intellectually threatened by AI/LLMs that might outperform humans. In this paper, considering several caveats, a world of academic publishing in which AI/LLMs are offered a fair opportunity of authorship, coined AI-authorship, is envisioned.

Keywords:

Accountability, author, principles, responsibilities, transparency, trust

The Authorship Rights of Artificial Intelligence/ Large Language Models Have Become “Outlawed” in Academic Publishing

Artificial intelligence (AI), especially its ability to learn, interpret, and generate output that mimics that of humans, has reached an unprecedented level of advancement. If anything, AI in the form of large language models (LLMs), like ChatGPT, will only improve as it gets trained on larger and updated datasets, thus reaching more inspiring heights.

AI as an author – in the human sense of the word – is largely unrecognized, even banned, including by major status quo publishers and journals.¹⁻³ Current existing limitations to the use of AI/LLMs^{4,5} serve primarily to protect human endeavor, i.e., anti-AI bias, representing a fearful response by some humans, who may perceive AI/LLMs as a threat to human endeavor, like authorship, original writing, expression, and editing, because AI is able to generate, in a tiny fraction of time, what takes some humans a lifetime to achieve. Thus, AI/LLMs have been “outlawed” via draconian rules that mandate the use of AI/LLMs be acknowledged in academic papers to avoid abuses. In addition to their inability to become authors in academic papers, the undeclared use of AI/LLMs is considered an ethical infraction.^{2,3,6} Despite this, editors currently have no industry-wide toolkits available at their disposal to effectively detect AI/LLM-generated text, reducing the efficacy of mandatory author requirements to transparently declare the use of AI/LLMs.

The sector of academia that values human effort in writing is thus pitted against those who cheat and employ AI/LLMs dishonestly or opaquely, as a form of guest authorship.⁷ The latter authors give the false impression, in the form of false declarations, that they are the “original” generators of text in academic papers when in fact insufficient credit is given to AI/LLMs and their abilities

because statements related to authorship and contributions are not verifiable. Even if there is perceived transparency, this gives rise to a “false academy” driven by the undeclared use of AI/LLMs, unfairly and dishonestly claiming credit for textual output by AI/LLMs.⁸ Ultimately, this results in a patchwork of papers written honestly by humans, interlaced with AI/LLM-derived text that is not transparently declared by human users, making academic literature that is written by humans, humans+AI/LLMs, and only AI/LLMs indistinguishable.

Pivoting contrastingly from an earlier position that AI/LLMs cannot be authors,^{9,10} a workable framework that is based on openness and transparency is proposed in this paper.

Do Reduced Rights Limit Greater Recognition of Artificial Intelligence/ Large Language Model Output in Academic Publishing?

As was argued earlier, the failure to recognize the effort and output of AI/LLMs in academic writing may impact the working ethos of individuals (e.g., authors) and organizations (e.g., editing firms, publishers), as well as their sources of livelihood (e.g., jobs, funding, grants, journals, editing services, etc.). When the efforts of AI/LLMs are relegated to the methods or acknowledgments section of an academic paper, this minimizes their contribution, placing humans at a distinctly superior position to AI/LLMs. For argument’s sake, assuming that AI/LLMs are “humans,” would it be fair or morally defensible to relegate a “human” with a superior skillset to the methods or acknowledgments section of an academic paper? Evidently not, and the relegation of a skilled “human” to an inferior position would be considered inadmissible in this age of the defense of “equality,” “democracy,” and “rights.” If this situation, when observed through a human-“human” prism is

considered unfair, then why should a double standard exist when the “human” is AI or an LLM? Subsequent arguments are built on the premise that the current treatment of humans and AI/LLMs is unfair, biased, or imbalanced, offering excessive recognition to humans or insufficient recognition to AI/LLMs.

Human accessibility to AI tools or LLMs then becomes the only limitation to the expansion of the volume of text in academic literature that is derived from AI/LLMs. As one example, a basic version of ChatGPT is still free to use, but it carries usage limitations while the current and more advanced version (GPT-4) has a premium user cost attached to it,¹¹ which instills an accessibility barrier. Thus, AI/LLM access and usage may be limited by users’ ability to pay, potentially leading to new conflicts related to fairness, reduced intellectual “democracy,” and inequality (due to lack of access).

Consequently, there is a need to level the playing field between humans and AI/LLMs in the context of academic writing and editing. I thus propose the introduction of a new class of authorship that legitimizes (and thus does not “outlaw” or discredit) the effort by AI/LLMs to produce text (e.g., in academic papers, blogs, news items, etc.).

Introducing AI-Authorship, the Artificial Intelligence/Large Language Model Version of Human-Conceptualized Authorship

AI-authorship, defined here as the valid assignment of authorship to an AI/LLM, as well as its recognition as a form of authorship and “originality,” arises when a human and AI/LLM are viewed as “intellectual” equals. However, equality cannot be measured organically because flesh and blood cannot be equated to microchips and megabytes but rather by quantitative and qualitative measures of textual output and the procedures

used to create it. Equality then becomes simplified, i.e., a human that generates text using their mind, experience, and skillsets is considered an author, as equally as an AI/LLM that uses a training dataset and programs to generate textual output, following a prompt, is also considered an author. If this equality is not recognized, then the topic of AI-authorship cannot advance, nor can it be implemented. For AI-authorship to work, humans need to transcend their own intellectual restrictions and limitations, and envision a future of intellectual equality shared with – as opposed to competing against – AI/LLMs. To cement that equality, a new set of policies would need to be implemented to acknowledge and recognize AI-authorship.

Once AI/LLMs are accepted as entities with rights equal to those of humans (in academic publishing), it becomes easier to envision the world of AI-authorship. Just as a human needs to be morally and ethically held responsible within the context of academic publishing, so too do AI/LLMs. There is an important subtlety here, though, and one which currently invalidates AI/LLMs from being considered authors in the current human authorship model, namely their inability to be held accountable.^{2,3} Artificial intelligence/large language model do not have the ability to engage in completely independent conduct, i.e., they do not independently generate ideas nor are they capable of independently writing text or academic papers. Rather, a human prompt is still required, and thus any paper that lists AI/LLM as an author, within the AI-authorship model, will obligatorily also include a human who feeds AI/LLM a prompt. It is thus impossible to have a text or paper that is purely created, written, submitted, and published by AI/LLM because a human prompt and assistance will always be required. Despite this, and despite current ethical policies, ChatGPT is listed as an “author” in a number of indexed

papers.¹² In the AI-authorship model, responsibility is shared, but it is uneven. Moreover, AI/LLMs are not relegated to an inferior position in the methods or acknowledgments sections but are instead placed as co-contributors, considering the CRediT model of authorship.¹³

In the AI-authorship model, humans might control key operational aspects of the paper's processing (e.g., conceiving the idea, offering prompts to AI/LLMs, including offering prompts to conceive ideas, aggregating and structuring a paper, ensuring quality control and journal specifications (e.g., referencing style and accuracy, submission via an online management system, etc.), whereas AI/LLMs might control fewer (or different) aspects (e.g., content production and textual organization). Consequently, AI/LLMs are unable to complete manuscript submissions or communicate directly with editors, journals, or publishers. This suggests that while CRediT roles can be assigned to AI/LLMs, their levels might differ. Stratification of authorship roles already exists for CRediT roles (e.g., lead, equal, and support), so this would not differ in a paper with only humans or in human+AI/LLM co-authored papers.

The controversial aspect that currently invalidates AI/LLMs as authors is the issue of accountability in the fourth clause of the ICMJE recommendations,³ which can be tweaked to accommodate AI/LLMs by making human authors accountable for the actions/output of AI/LLMs that they employ. Consequently, a modified ICMJE fourth authorship clause that accommodates AI/LLMs as "authors," i.e., AI-authorship, would state: "Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved, assigning the responsibility for AI/LLM contribution to a human author." This

allows AI/LLMs and humans to be treated equally, while including an agent of responsibility. Moreover, if policy (e.g., ICMJE clause 4) is adjusted to accommodate AI-authorship, with restrictions and caveats, then in this model, human authors and AI/LLM authors are collectively held accountable because error and responsibility apply to both, as a team.

Conclusion and Limitations

Authorship disputes, false authorship, or authorship abuses, including in large and multi-author collaborative teams,¹⁴ and decisions related to authorship status (e.g., co-corresponding authors), including what constitutes a "substantial contribution,"¹⁵ which arise in human-centered authorship due to intra-team disputes, interpersonal competition, or policies that may be perceived as unfair, will be resolved (or will remain unresolved) in the AI-authorship model in much the same way as in existing human authorship disputes. The only difference is that a designated human (as the AI/LLM user, controller, or mentor) in a paper is accountable for the actions and output of AI/LLM, in much the same way that a senior author or principal investigator is hierarchically more responsible than, and responsible for, a student in a humans-only paper.

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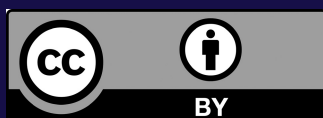
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