AI in Publishing: Challenges and Opportunities

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How it started

Science Journals:
Artificial intelligence (AI). Text generated from AI, machine learning, or similar algorithmic tools cannot be used in papers published in *Science* journals, nor can the accompanying figures, images, or graphics be the products of such tools, without explicit permission from the editors. In addition, an AI program cannot be an author of a *Science* journal paper.

EDITORIAL

ChatGPT is fun, but not an author

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Nature: AI Authorship
Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs. Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript.

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Let's ask ChatGPT!

Prompt: What are the challenges and opportunities of using AI in scientific publishing?

Response: Using AI in scientific publishing presents both challenges and opportunities:

Challenges:
1. Quality control
2. Bias and fairness
3. Intellectual property
4. Transparency
5. Job displacement
6. Resistance to change

Opportunities:
1. Efficiency
2. Enhanced research discovery
3. Personalization
4. Data analysis
5. Language assistance
6. Predictive analysis

"Balancing these challenges and opportunities will be crucial for the future of scientific publishing as AI continues to evolve."

Doing the research: Data analysis

Opportunities

AlphaFold and RoseTTAFold "solve" protein folding. But these algorithms learn from a well-curated dataset, and there are good metrics for success.

Challenges

- Sufficient high-quality data
- Accounting for bias in the data
- Bias in how the question is asked

Dissecting racial bias in an algorithm used to manage the health of populations

ZIAD OBERMEYER , BRIAN POWERS, CHRISTINE VOGELI, AND SENDHIL MULLAINATHAN   Authors Info & Affiliations
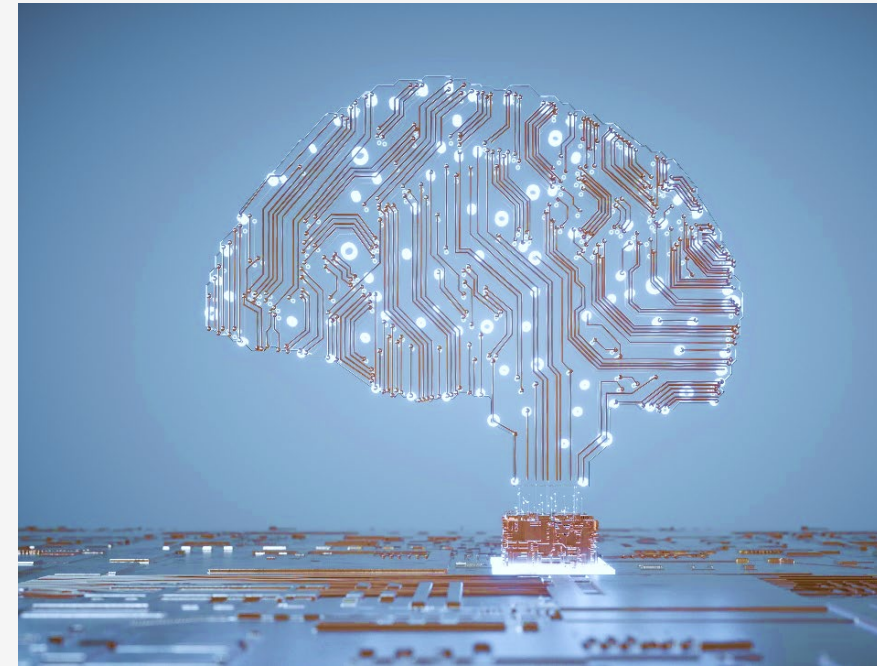
Writing the paper

Opportunities

Tools for background research and manuscript writing/editing are emerging. Will they level the playing field?

- ChatGPT
- Scite
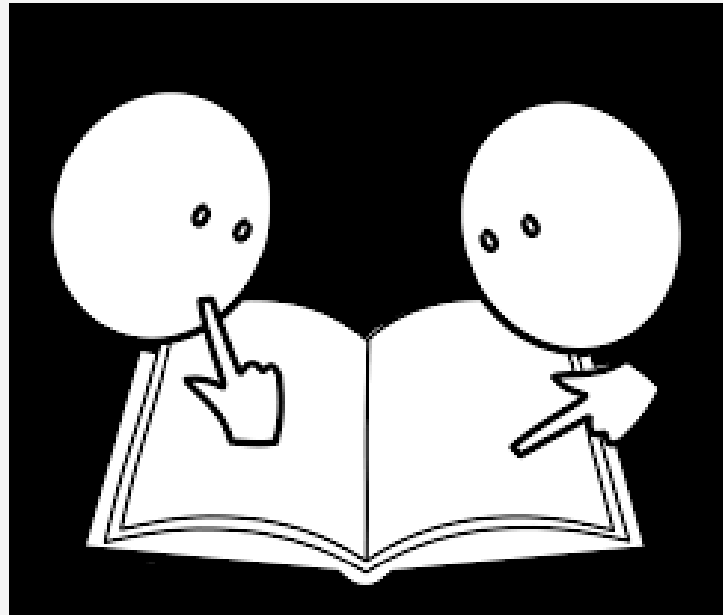- Consensus
- ResearchRabbit
- Perplexity

Challenges

- Completeness and accuracy of the paper
- Appropriate citation
- Accountability

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Food for thought

Will these tools help authors by improving the language in their papers?

Or will the tools ultimately hurt authors by introducing errors?

Evaluating the paper

Opportunities

- Detect plagiarism (iThenticate) and image manipulation (Proofig)
- Improve compliance with data policies (DataSeer)
- Scale-up potential
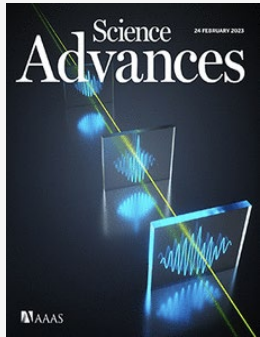- Enhance tools to find reviewers – could this improve diversity?

Challenges

- Transparency – authors expect review by an expert
- Quality and accuracy of review
- Confidentiality – many chatbots retain the input data

Communicating the science

Opportunities

Gold Open Access

Green Open Access – the author accepted manuscript can be deposited

AI could help contextualize the science and write summaries for a lay audience.

Challenges

Datasets used by chatbots will have biases and may include publications that are not peer reviewed. This could drive misinformation.

How it's going

November 2023: Revised policy at the *Science* Journals

- ChatGPT/LLMs cannot be an author or co-author
- Okay to use AI writing tools, but version and prompt must be declared
- No AI-generated images or multimedia (without editor permission)
- Authors are accountable for accuracy
- Authors must ensure that there is no plagiarism and that sources are properly cited
- No LLMs for peer review
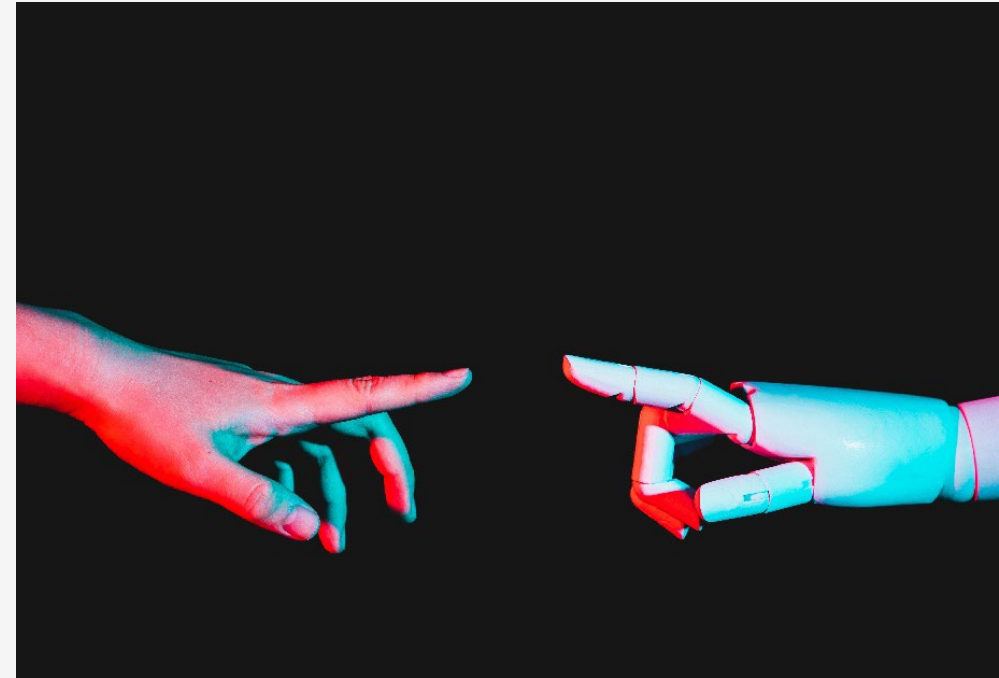
Future directions
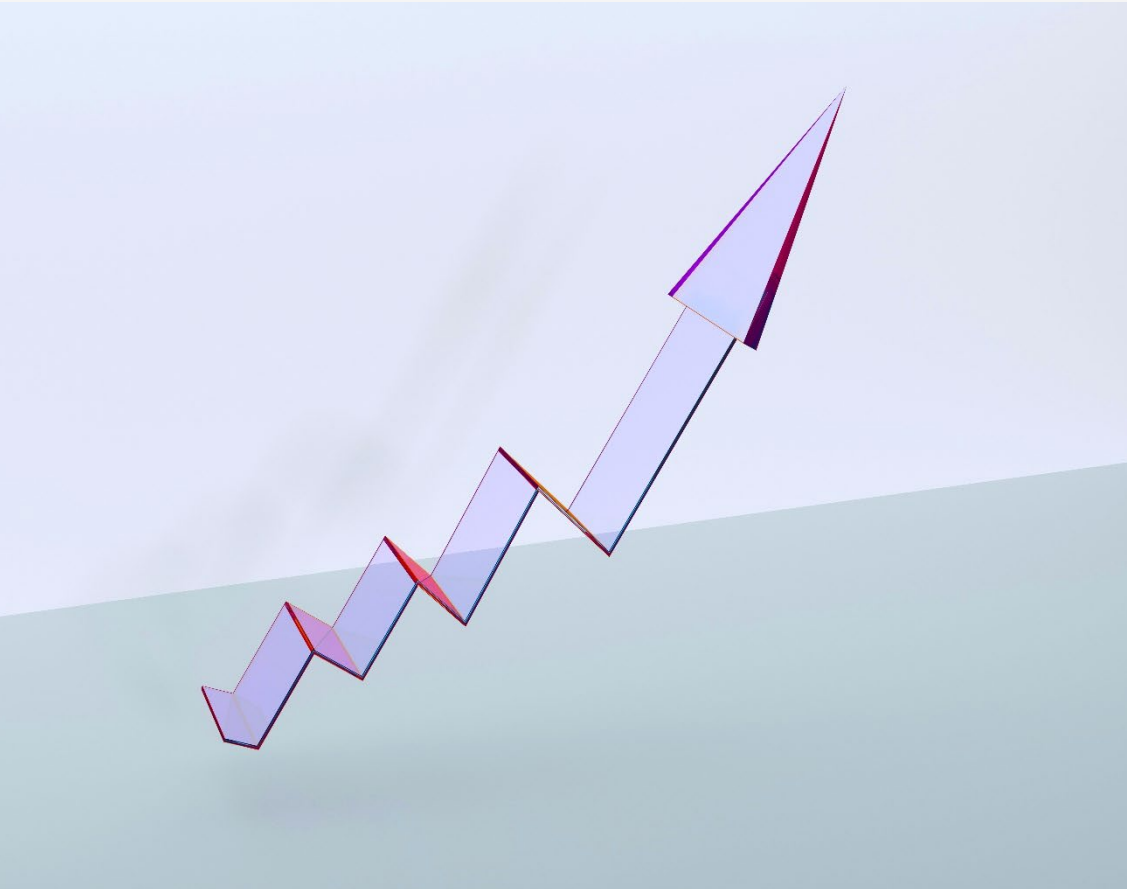
"Science will continue to follow this challenging landscape and cautiously adapt as needed."

Resources:
- CSE (Council of Science Editors)
- ICMJE (International Committee of Medical Journal Editors)
- WAME (World Association of Medical Editors)
- COPE (Committee on Publication Ethics)

Thank you!

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