



Ethics of Science and Research at the AI Age

September 16, 2024

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Funding acknowledgments

Gratitude expressed!

- Office of Data Science Strategy (3OT2DB000013-01S1)
- National Center for Advancing Translational Sciences(5UL1TR001422-08)
- Network of the National Library of Medicine Evaluation Center (U24 LM013751)

The ethics of using AI in research

AI and Ethics, Bioethics Today

AI and Ethics

<https://doi.org/10.1007/s43681-024-00493-8>

ORIGINAL RESEARCH



The ethics of using artificial intelligence in scientific research: new guidance needed for a new tool

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Received: 14 December 2023 / Accepted: 7 May 2024

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Abstract

Using artificial intelligence (AI) in research offers many important benefits for science and society but also creates novel and complex ethical issues. While these ethical issues do not necessitate changing established ethical norms of science, they require the scientific community to develop new guidance for the appropriate use of AI. In this article, we briefly introduce AI and explain how it can be used in research, examine some of the ethical issues raised when using it, and offer nine recommendations for responsible use, including: (1) Researchers are responsible for identifying, describing, reducing, and controlling AI-related biases and random errors; (2) Researchers should disclose, describe, and explain their use of AI in research, including its limitations, in language that can be understood by non-experts; (3) Researchers should engage with impacted communities, populations, and other stakeholders concerning the use of AI in research to obtain their advice and assistance and address their interests and concerns, such as issues related to bias; (4) Researchers who use synthetic data should (a) indicate which parts of the data are synthetic; (b) clearly label the synthetic data; (c) describe how the data were generated; and (d) explain how and why the data were used; (5) AI systems should not be named as authors, inventors, or copyright holders but their contributions to research should be disclosed and described; (6) Education and mentoring in responsible conduct of research should include discussion of ethical use of AI.



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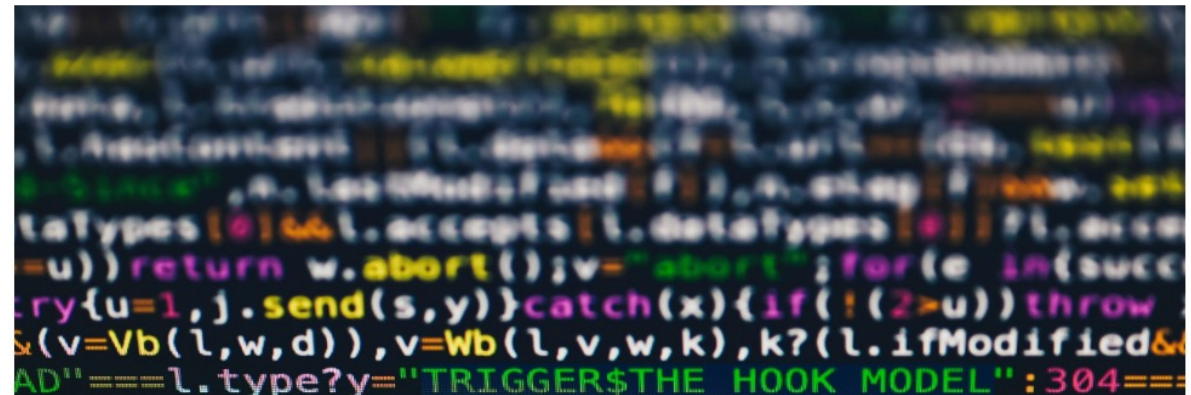
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Publish date

29th July 2024



Ethics of Science and Research

What ethical norms are we talking about?

Ethical norms of science are derived from principles, values, or virtues that are essential for conducting good research.

- Some are expressed in codes of conduct and other sources
- Some are implicit in the practice
- Some are epistemic
- Some are moral
- Some are epistemic and moral

Ethical norms of science have changed over time, and are likely to continue to evolve.

Using AI in Research

It is affecting many aspects of our research culture

- Increasing use of AI in research
- Different tasks
- Range of use cases in different contexts

AI and the ethics of science

Ethical issues that we are currently dealing with

1. AI biases
2. AI random errors
3. AI and research misconduct
4. The black box problem
5. AI and confidentiality
6. AI and moral agency
7. AI and research ethics education

The appropriate use of AI in research

We should use AI responsibly

1. Researchers are **responsible** for identifying, describing, reducing, and controlling AI-related biases and random errors.
2. Researchers should **disclose**, describe, and explain their use of AI in research, including its limitations, in language that can be understood by non-experts.
3. Researchers should use AI only in situations in which they have **sufficient expertise** or judgement to use it responsibly.

The appropriate use of AI in research

We should use AI responsibly

4. Researchers should engage with **impacted communities**, populations, and other stakeholders concerning the use of AI in research to obtain their advice and assistance and address their interests and concerns, such as issues related to bias.
5. Researchers who intentionally, knowingly, or recklessly use AI to fabricate or falsify data or commit plagiarism are **liable for misconduct**.

The appropriate use of AI in research

We should use AI responsibly

6. Researchers who use **synthetic data** should I) indicate which parts of the data are synthetic; II) clearly label the synthetic data; III) describe how the data were generated; and IV) explain how and why the data were used.
7. AI systems should not be named as **authors**, but their contributions to research should be disclosed and described.

The appropriate use of AI in research

Given these challenges, we should use AI responsibly

8. AI systems should not be used in situations that are likely to involve unauthorized disclosure of **confidential information** related to human research subjects, unpublished research, potential intellectual property claims, or proprietary or classified research.
9. **Education** and mentoring in responsible conduct of research should include discussion of ethical use of AI.

Using AI in clinical research

Specific challenges, specific concerns

1. Using AI to prepare submissions to ethics committees
2. Using data from human participant research to train AI
3. Uploading human research data to AI systems
4. The scope of ethics committee responsibilities



Thanks so much

Any feedback is welcome & appreciated

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