



Living guidelines on the responsible use of generative AI in research

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Generative AI in research

The use of Generative AI and in particular Large Language Models (LLMs) for research has been debated intensively:

Powerful research assistants, but...

Hallucinations, bias, accountability, research integrity, transparency,...

Viewpoint | [Published: 26 April 2023](#)

Science in the age of large language models

“Researchers need to collaborate with journals, publishers, conference organizers, the press and the wider scientific community to develop best practices, standards and detection methods to ensure that **the benefits of GenAI can be realized without fundamentally undermining science** and its role in society.”

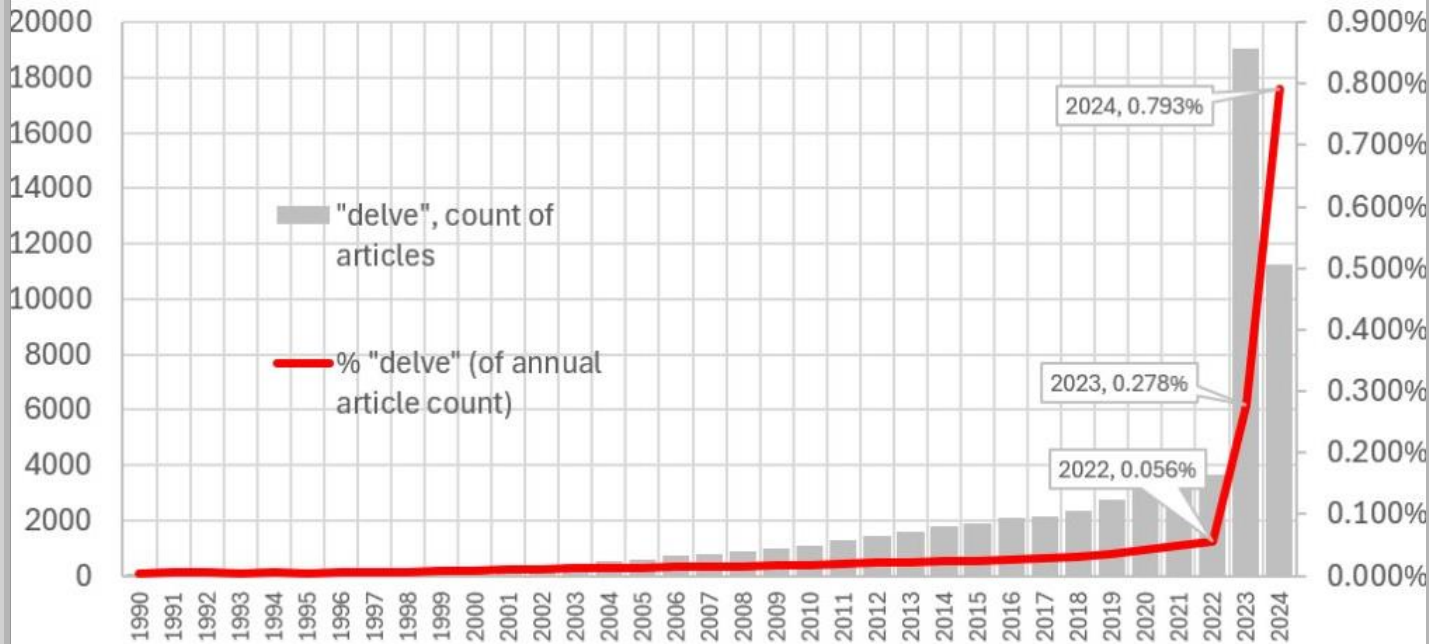
ChatGPT: five priorities for research

Conversational AI is a game-changer for science. Here's how to respond.

Adoption of generative AI in research

Papers with "delve" in title or abstract

Source: Analysis of OpenAlex, type=articles



Analysis using OpenAlex by Philip Shapira, March 31, 2024.

<https://pshapira.net/2024/03/31/delving-into-delve/>

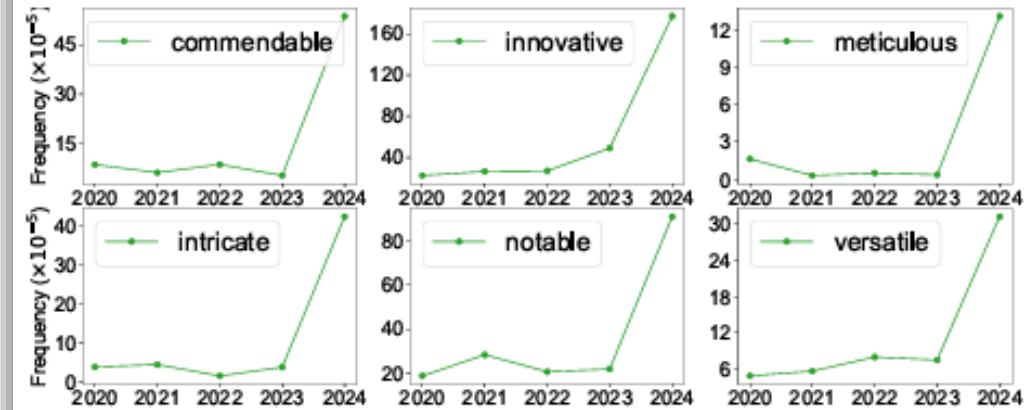


Figure 1: Shift in Adjective Frequency in *ICLR 2024* Peer Reviews. We find a significant shift in the frequency

arXiv:2403.07183v1 [cs.CL] 11 Mar 2024

Adoption of generative AI in research (II)

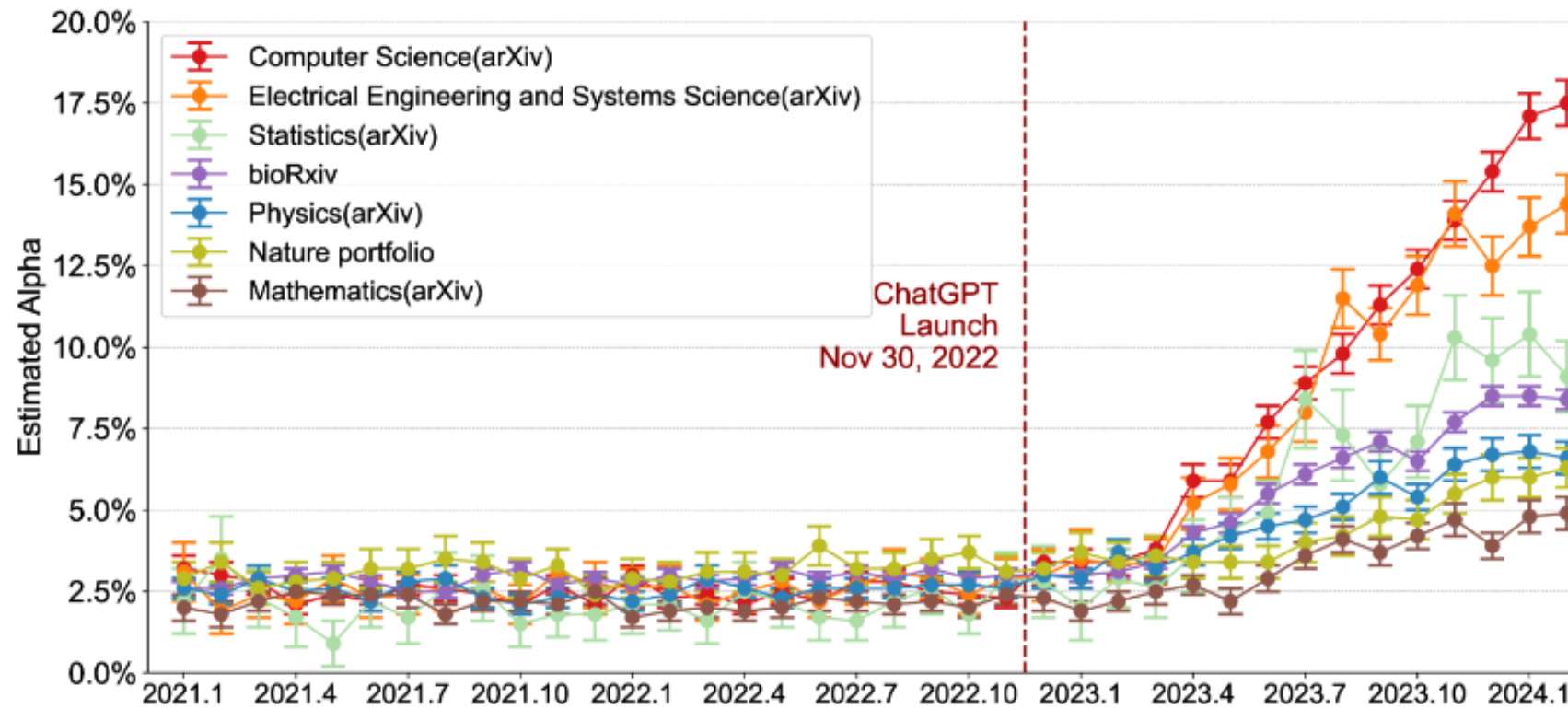


Figure 1: **Estimated Fraction of LLM-Modified Sentences across Academic Writing Venues over Time.** This figure displays th

Proliferation of guidelines

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Responsible use of Generative Artificial Intelligence (GenAI) in research



The European Code of Conduct for Research Integrity

REVISED EDITION 2023



Aalto University



NATIONAL ACADEMIES
Sciences
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National Institute of Environmental Health Sciences



JAMA Network™

A European approach



GOALS

- 1) Accelerate responsible uptake of generative AI
- 2) Avoid a fragmented landscape of ideas

ADDED VALUE

- 1) Align across EU
- 2) Reach larger population of stakeholders
- 3) Increase visibility
- 4) Influence international practice

The Process

Drafted in co-creation

ERA Forum: Countries
R&I Stakeholders

Consultation

Different actors

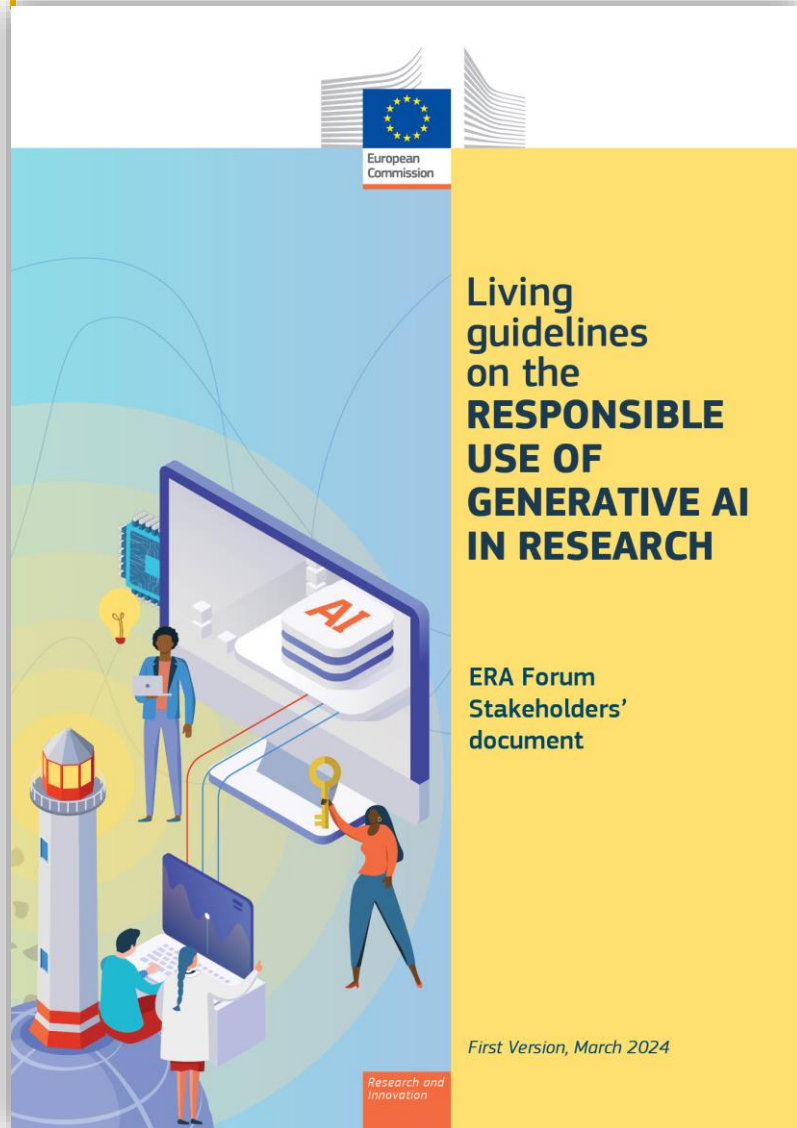
Improving

Feedback form

Updating

ERA Forum & scientific
community

The Guidelines



Simple and actionable

Inclusive

Iterative and dynamic

The Recommendations

RESEARCHERS should...

- 🔍 Follow key principles of research integrity, use GenAI transparently and remain ultimately responsible for scientific output.
- 🔒 Use GenAI preserving privacy, confidentiality, and intellectual property rights on both, inputs and outputs.
- 🧠 Maintain a critical approach to using GenAI and continuously learn how to use it responsibly to gain and maintain AI literacy.
- 🚫 Refrain from using GenAI tools in sensitive activities e.g. peer reviews or evaluations.

RESEARCH ORGANISATIONS should...

- 📋 Guide the responsible use of GenAI and actively monitor how they develop and use tools.
- 📄 Integrate and apply these guidelines, adapting or expanding them when needed.
- 🧑‍🔬 Deploy their own GenAI tools to ensure data protection and confidentiality.

FUNDING ORGANISATIONS should...

- 👏 Support the responsible use of GenAI in research.
- 📋 Use GenAI transparently, ensuring confidentiality and fairness.
- 🧑‍🔬 Facilitate the transparent use of GenAI by applicants.

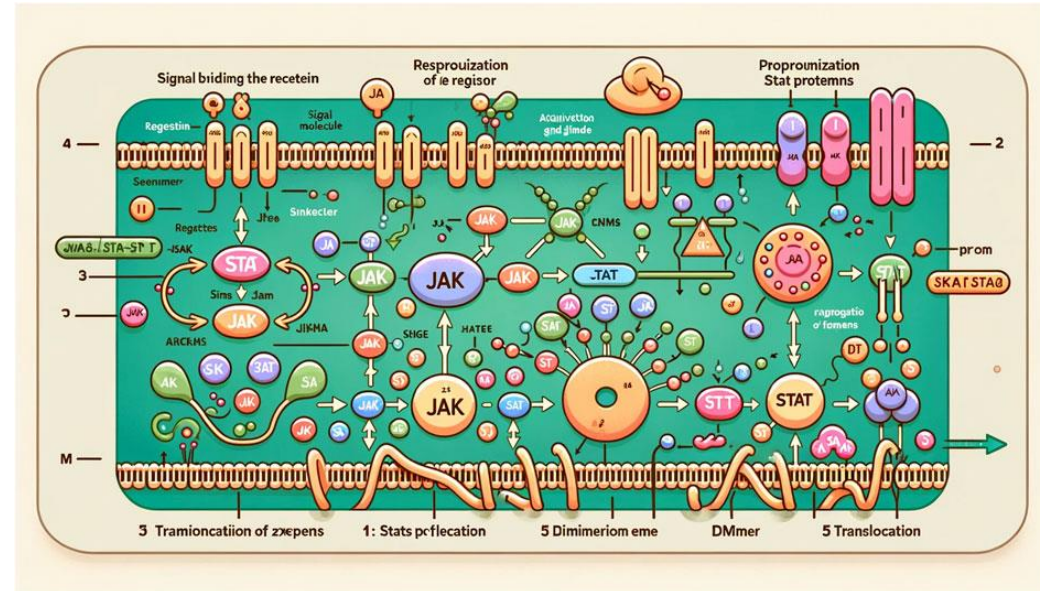
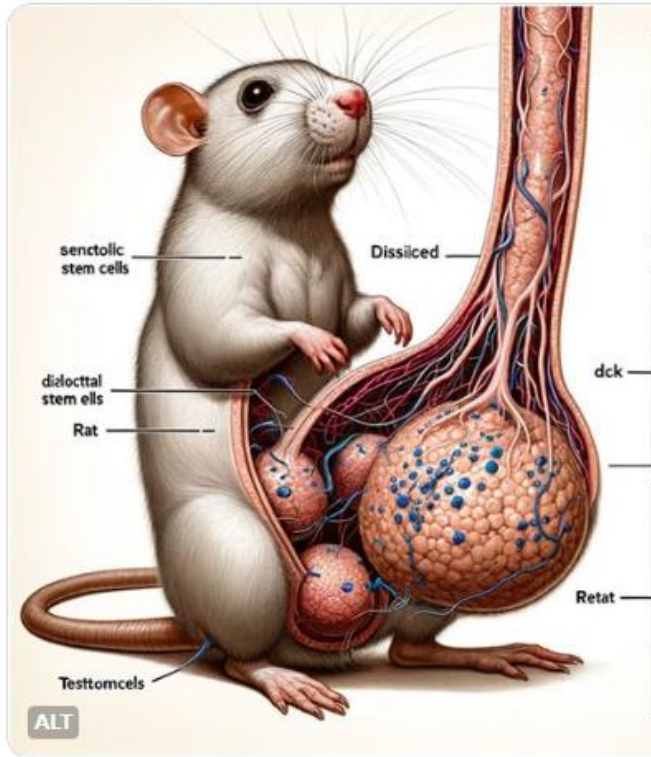
2024 Autumn update

- Collecting feedback: Feedback mechanism, meeting different stakeholders, participation in events, literature review,..
- Aiming to a targeted update
- Work planned with the ERA Forum
- Keeping in mind the political calendar
- Used it as an opportunity for further dissemination

Examples of bad use of generative AI

Dr CJ Houldcroft 
@DrCJ_Houldcroft

Erm, how did Figure 1 get past a peer reviewer?!
frontiersin.org/articles/10.33... H/T @aero_anna



A Retraction of the Review Article

Cellular functions of spermatogonial stem cells in relation to JAK/STAT signaling pathway

by Guo X, Dong L and Hao D (2024). *Front. Cell Dev. Biol.* 11:1339390. doi: 10.3389/fcell.2023.1339390

Following publication, concerns were raised regarding the nature of its AI-generated figures. The article does not meet the standards of editorial and scientific rigor for *Frontiers in Cell and Developmental Biology*; therefore, the article has been retracted.

Examples of bad use of generative AI (II)



The three-dimensional porous mesh structure of Cu-based metal-organic-framework - aramid cellulose separator enhances the electrochemical performance of lithium metal anode batteries

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ARTICLE INFO

Keywords:

Lithium metal battery
Lithium dendrites
CuMOF-ANFs separator

ABSTRACT

Lithium metal, due to its advantages of high theoretical capacity, low density potential, is used as a negative electrode material for batteries and brings great energy storage systems. However, the production of lithium metal dendrite poor safety, so lithium dendrites have been the biggest problem of lithium metal. The larger specific surface area and more pore structure of Cu-based metal-organic (CuMOF-ANFs) composite separator can help to inhibit the formation of lithium metal. The discharge capacity retention rate of the Li-Cu battery using the CuMOF-ANFs composite separator is 95.2% after 2000 cycles. The Li-Li batteries can continue to maintain low hysteresis for 2000 h at the 0.1C rate, which shows that CuMOF-ANFs composite membrane can inhibit the generation of lithium dendrites and improve the cycle stability and cycle life of the battery. The three-dimensional (3D) porous separator provides a new perspective for the practical application of lithium

1. Introduction

Certainly, here is a possible introduction for your topic: Lithium metal batteries are promising candidates for high-energy-density rechargeable batteries due to their low electrode potentials and high theoretical capacities [1,2]. However, during the cycle, dendrites forming on the lithium metal anode can cause a short circuit, which can

chemical stability of the separator is equal to that of the electrolyte or other battery components. The CuMOF-ANFs composite separator helps to prevent the formation of lithium dendrites and further promotes dendrite growth. Research on different materials and designs for separators with high mechanical strength and chemical stability

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