

Summer 2025

Lib4RI Training Series: Module 8b – AI in Research & Scientific Writing

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Introduction

AI Tools in Scientific Writing: An Overview

- Examples
 - general LLMs (e.g. ChatGPT)
 - grammar checkers (e.g. Grammarly)
 - translation software (e.g. DeepL)
 - specialized systems (e.g. SciteAI)
- Growing adoption in academia
 - drafting
 - editing
 - data analysis
 - literature review
 - ?

Opportunities

- Automates tasks like grammar checks, translations, formatting
- Improved writing
 - Enhance language quality, style, length
 - Better structuring
 - Avoid writer's block
- Literature discovery
 - Streamlined literature search
 - View connectivity map
- Data analysis support
 - Data extraction
 - Plotting
 - Vibe coding, code documentation

Downsides

- Accuracy concerns
 - Incorrect
 - Inconsistent
 - Biased
- Writing style
 - Might not be able to maintain intended / initial style
 - Inconsistent abbreviation or introducing same abbreviation multiple times
- Might lead to over-reliance
 - Reduce critical thinking
- Inconsistent rules across scientific journals
 - Varying policies create confusion

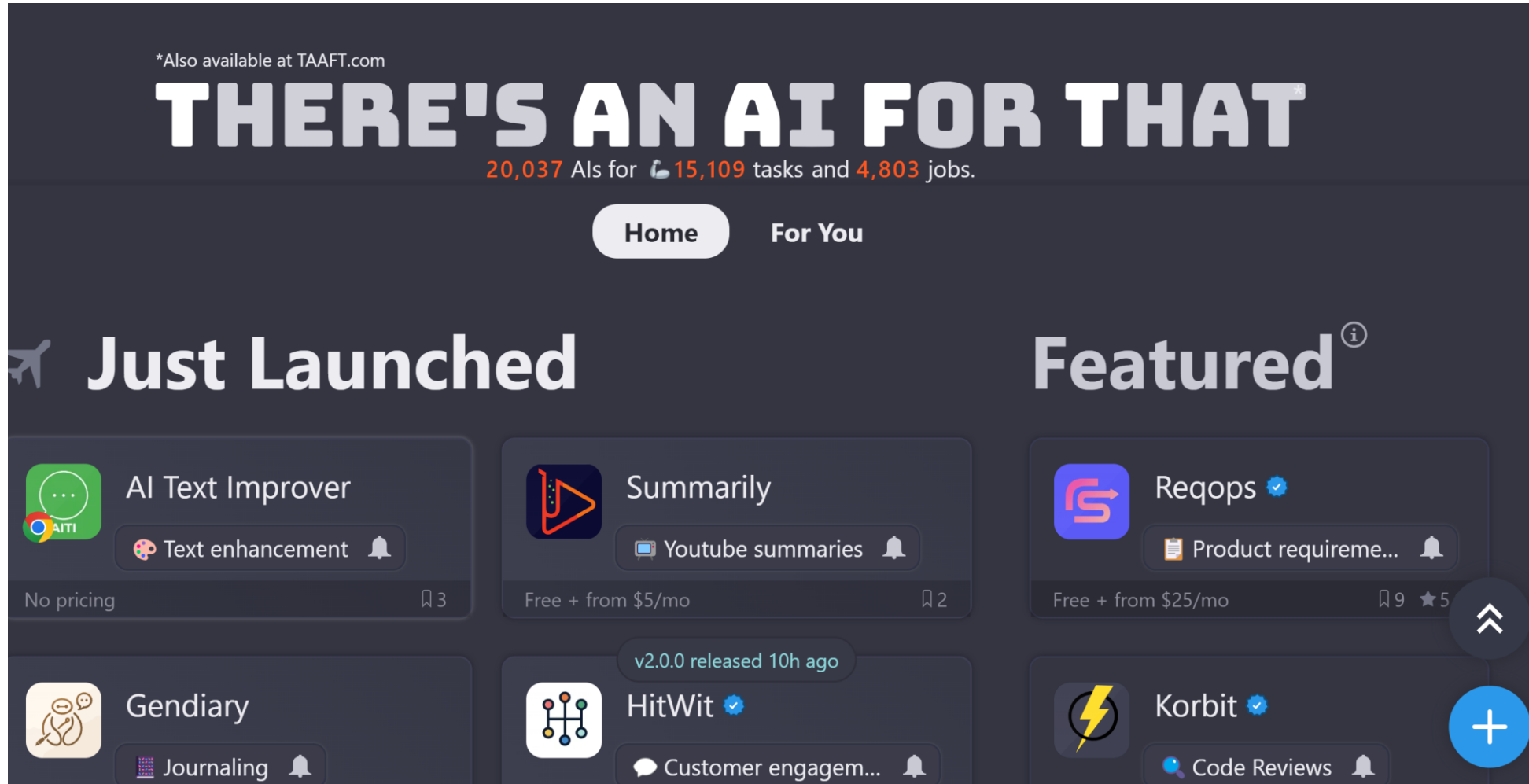
Ethical Concerns

- Plagiarism risks
 - May lead to unintentional plagiarism or copyright violations
- Data privacy and confidentiality breaches (e.g. in peer review)
 - AI use by reviewers' risks breaching manuscript confidentiality
- Environmental impact



<https://theresanaiforthat.com/>

- Database with latest AI tools



AI Scientific Writing Guidelines

European commission guidelines on the responsible use of generative AI in research

- Remain ultimately responsible for scientific output
- Use generative AI transparently
- Pay attention to *privacy*, *confidentiality* and *intellectual property rights*
- Respect national and international law (e.g. export control)
- Continuously learn to use AI tools proficiently
- Refrain from using generative AI tools substantially in sensitive activities that could impact other researchers or organizations
 - Peer review
 - Evaluation of research proposals

https://research-and-innovation.ec.europa.eu/document/2b6cf7e5-36ac-41cb-aab5-0d32050143dc_en

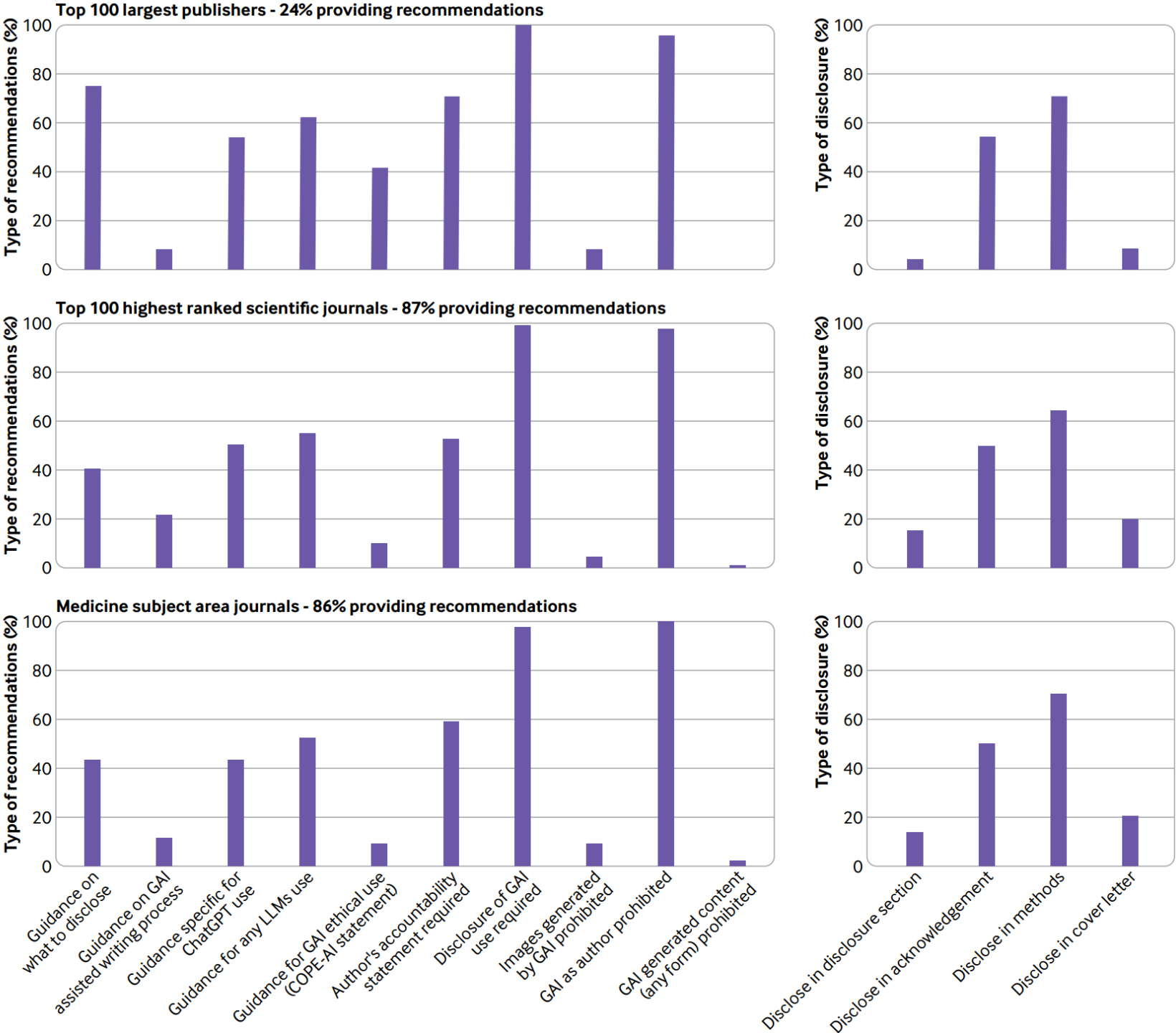
ETH Zurich guidelines

- Responsibility
 - You are responsible for the contents of your work
- Transparency
- Fairness
 - Respect data privacy
 - Copyright

https://ethz.ch/content/dam/ethz/main/eth-zurich/education/ai_in_education/Generative%20AI%20in%20Teaching%20and%20Learning%20-%20Guidelines%20ETH.pdf

Publishers' and journals' instructions to authors on use of genAI in scientific writing

Ganjavi, Conner, et al. "Publishers' and journals' instructions to authors on use of generative artificial intelligence in academic and scientific publishing: bibliometric analysis." *bmj* 384 (2024).



Citing Generative AI

ETH Zurich Guidelines

Generative artificial intelligence

Output created by generative artificial intelligence cannot be attributed to any author. Because the output is not reproducible or reliable, it does not constitute a citable or citation-worthy scientific source⁶. If tools based on artificial intelligence are used, they must be declared or identified transparently. Failure to declare the use of such tools amounts to ghostwriting.

Authors of Bachelor's, Master's and doctoral theses must sign a declaration of originality stating whether generative artificial intelligence tools were used in their work. In this context, an individual agreement with the supervisor is decisive as to whether AI must be declared or not.

The content of these guidelines was developed by the ETH Library in consultation with Academic Services (Education Legislation) and the Scientific Integrity Office.
Last accessed: 10 February 2025

<https://ethz.ch/content/dam/ethz/main/education/rechtliches-abschluesse/leistungskontrollen/plagiarism-citationetiquette.pdf>

Citing Generative AI

ETH Zurich Guidelines

- ETH Zurich's declarations of originality for theses' adapted to include a passage on the use of AI
- Include three options on the use of generative artificial intelligence:
 - Generative AI technologies were *not* used
 - Generative AI was used and labelled
 - Generative AI was used and not labelled in consultation with the person in charge

<https://ethz.ch/content/dam/ethz/main/education/rechtliches-abschluesse/leistungskontrollen/declaration-originality.pdf>

Citing Generative AI - Elsevier

Please note this policy only refers to the writing process, and not to the use of AI tools to analyze and draw insights from data as part of the research process.

- AI tools can be used only for improving readability and language—not for generating content
- Authors must review and edit AI-assisted content to avoid errors, biases, or misleading information
- Authors are solely responsible for the accuracy and integrity of their work
- Disclosure is mandatory
- AI cannot be listed as an author
- Generative AI to create or alter images NOT permitted unless part of the research question (methods)

<https://www.elsevier.com/about/policies-and-standards/the-use-of-generative-ai-and-ai-assisted-technologies-in-writing-for-elsevier>

Library for the Research Institutes within the ETH Domain: Eawag, Empa, PSI & WSL

For example, if a study is specifically about AI-assisted biomedical imaging—such as using AI to enhance MRI scans – then it is permitted. However, the authors must document this usage clearly in the methods section and provide raw data.

Citing Generative AI - Springer Nature

accountability for the work, which cannot be effectively addressed. The work should be properly documented in the Methods section of the manuscript (or in a suitable alternative part) of the manuscript. The use of AI tool) for "AI assisted copy editing" purposes does not constitute AI-generated content. We define the term "AI assisted copy editing" as AI-generated texts for readability and style, and to correct grammar, spelling, punctuation and tone. These AI-generated texts are used for wordings and formatting changes to the texts, but not for autonomous content creation. In all cases,

Generative AI Images

The fast moving area of generative AI image creation has resulted in novel legal copyright and research integrity issues. As publishers, we strictly follow existing copyright law and best practices regarding publication ethics. While legal issues relating to AI-generated images and videos remain broadly unresolved, Springer Nature journals are unable to permit its use for publication.

Exceptions:

- Images/art obtained from agencies that we have contractual relationships with that have created images in a legally acceptable manner.
- Images and videos that are directly referenced in a piece that is specifically about AI and such cases will be reviewed on a case-by-case basis.
- The use of generative AI tools developed with specific sets of underlying scientific data that can be attributed, checked and verified for accuracy, provided that ethics, copyright and terms of use restrictions are adhered to.

<https://www.springer.com/gp/editorial-policies/artificial-intelligence--ai-/25428500>

Citing Generative AI - Science

may not be listed as authors or coauthors, nor may sources cited in *Science* journal content be authored or coauthored by AI tools. Authors who use AI-assisted technologies as components of their research study or as aids in the writing or presentation of the manuscript should note this in the cover letter and in the acknowledgments section of the manuscript. Detailed information should be provided in the methods section: The full prompt used in the production of the work, as well as the AI tool and its version, should be disclosed. Authors are accountable for the accuracy of the work and for ensuring that there is no plagiarism. They must also ensure that all sources are appropriately cited and should carefully review the work to guard against bias that may be introduced by AI. Editors may decline to move forward with manuscripts if AI is used inappropriately. Reviewers may not use AI technology in generating or writing their reviews because this could breach the confidentiality of the manuscript.

AI-generated images and other multimedia are not permitted in the *Science* journals without explicit permission from the editors. Exceptions may be granted in certain situations—e.g., for images and/or videos in manuscripts specifically about AI and/or machine learning. Such exceptions will be evaluated on a case-by-case basis and should be disclosed at the time of submission. The

<https://www.science.org/content/page/science-journals-editorial-policies#image-and-text-integrity>

Citing Generative AI - IEEE

The use of content generated by artificial intelligence (AI) in an article (including but not limited to text, figures, images, and code) shall be disclosed in the acknowledgments section of any article submitted to an IEEE publication. The AI system used shall be identified, and specific sections of the article that use AI-generated content shall be identified and accompanied by a brief explanation regarding the level at which the AI system was used to generate the content.

The use of AI systems for editing and grammar enhancement is common practice and, as such, is generally outside the intent of the above policy. In this case, disclosure as noted above is recommended.

<https://open.ieee.org/author-guidelines-for-artificial-intelligence-ai-generated-text/>

Citing Generative AI - Wiley

Disclosure: If an author has used AI Technology to develop any portion of a manuscript, its use must be described, transparently and in detail, in the **Methods section** (or via a disclosure or within the Acknowledgements section, as applicable). The author is fully responsible for the accuracy of any information provided by the tool and for correctly referencing any supporting work on which that information depends. GenAI tools must not be used to create, alter, or manipulate original research data and results. Tools that are used to improve spelling, grammar, and general editing are not included in the scope of these disclosure guidelines. The final decision about whether use of a GenAI tool is appropriate or permissible in the circumstances of a submitted manuscript or a published article lies with the journal's editor or other party responsible for the publication's editorial policy.

<https://authorservices.wiley.com/ethics-guidelines/index.html>

Citing Generative AI - SNF

In research these tools can be used, for example, **for literature reviews**, editorial tasks or **translations**. Researchers may also use them to **prepare their grant applications**. The SNSF for its part uses AI applications to help process funding applications and, moreover, is looking into their further potential.

Researchers are responsible for their own content

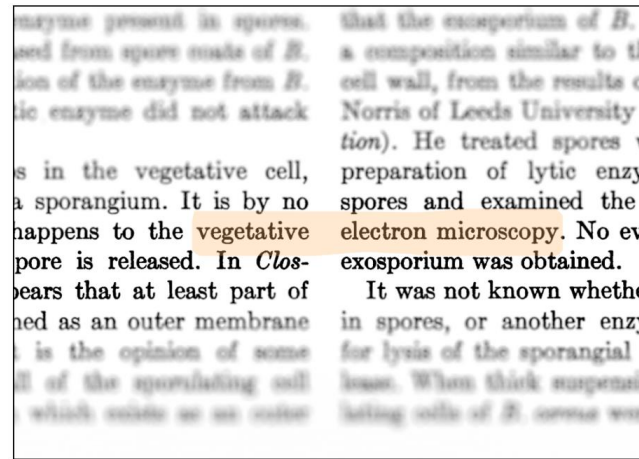
The SNSF would like to emphasise that researchers who use AI for their work are wholly **responsible for the results produced**. For research proposals, the basic principle is that the applicants are the sole authors and as such bear full responsibility for the content.

<https://www.snf.ch/en/Gz1VrJkLyay4H7z/news/the-snsfs-approach-to-the-use-of-artificial-intelligence-in-funding-applications>

AI generated papers: vegetative electron microscopy

- Term found in more than 20 papers published after 2022, including a paper from 2024 whose senior author is an editor at Elsevier.

The phrase was so strange it would have stood out even to a non-scientist. Yet “vegetative electron microscopy” had already made it past reviewers and editors at several journals when a Russian chemist and scientific sleuth noticed the odd wording in a now-retracted paper in Springer Nature’s *Environmental Science and Pollution Research*.



The origin of the phrase?

U.S. Copyright Office on AI and Copyrightability

- addresses the legal and policy implications of AI-generated content
- copyright law in the U.S. requires **human authorship**
- **purely AI-generated** works do not qualify for copyright protection
- **text prompts alone do not constitute authorship**, as they lack sufficient creative control over the output
- AI can be **used as a tool**, but copyright applies only to the human-authored portions – expressive inputs
- **case-by-case assessments** will determine whether a work has enough human authorship to qualify for copyright

<https://copyright.gov/ai/Copyright-and-Artificial-Intelligence-Part-2-Copyrightability-Report.pdf>

U.S. Copyright Office on AI and Copyrightability

Human expressive inputs

- human **modifies, selects, or arranges** AI-generated content in a creative way

Example 1

- A human artist creates an original illustration and then inputs it into an AI system, instructing the AI to modify aspects such as color or layering while retaining the essential composition of the original work

Example 2

- A user uploads a story written in the first person and instructs the AI to convert it into a third-person narrative

U.S. Copyright Office on AI and Copyrightability

Example 3

- A user inputs a prompt such as "a professional photo of a bespectacled cat in a robe, reading a newspaper, cinematic lighting."
- The AI system generates an image based on this input, but the user has no direct control over how the AI interprets the prompt. The resulting image is not copyrightable

Example 4

- A user refines a prompt multiple times to get a desired result (e.g., adjusting words or phrases to influence the AI output).
- Even though the user invests time and effort in refining the prompt, this process is not considered creative authorship because the final artistic decisions are made by the AI, not the user

U.S. Copyright Office on AI and Copyrightability

Example 5

- An artist provides a hand-drawn illustration as an input, along with a detailed prompt
- The final AI-generated image clearly retained elements of the original human drawing, such as the shape and placement of features
- The AI-enhanced aspects (like lighting and shadows) were not considered human-authored, and the copyright registration was limited to the human-created portions



U.S. Copyright Office on AI and Copyrightability

Example 6

- A person generates multiple AI images and chooses the best one.
- The selection process itself does not involve enough creative input to be considered authorship
- A film that includes AI-generated special effects or background.
- the inclusion of elements of AI-generated content in a larger human-authored work does not affect the copyrightability of the larger human-authored work as a whole, even if the AI effects by themselves are not

U.S. Copyright Office on AI and Copyrightability

International approaches

- most countries currently apply existing copyright laws to AI-generated content, similarly requiring human authorship
- some nations are exploring legal reforms to clarify AI-related copyrightability but have not yet enacted significant changes
- *Swiss copyright law* (like U.S. law) requires that a work be a literary and artistic intellectual creation with individual character

Do's and Don'ts

- ✓ Use AI tools and providers that provide the required data privacy
- ✓ Always review the output of the AI tool
- ✓ Integrate the output in your work in your own style
- ✓ Follow publisher's guideline in declaring the use of AI tools

- ✗ Upload your confidential work to AI provider
- ✗ Upload someone else's work without their consent
- ✗ Copy and paste AI output in your work without checking
- ✗ List AI as author on your scientific work

When Can You Upload Data to AI Tools?

Allowed

- Public content
- Non-Sensitive Internal Data

Not Allowed

- **Confidential Organizational Data**
 - Documents like meeting minutes or classified internal reports
- **Personal Data**
 - Information protected under data privacy laws, personal identifiers or sensitive details

Not Recommended

- **Unpublished Research Data**
 - Drafts, raw data, or findings from ongoing studies that are not yet public.

Key Rule:

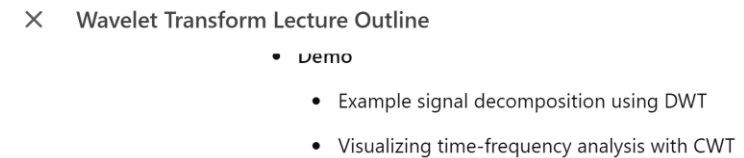
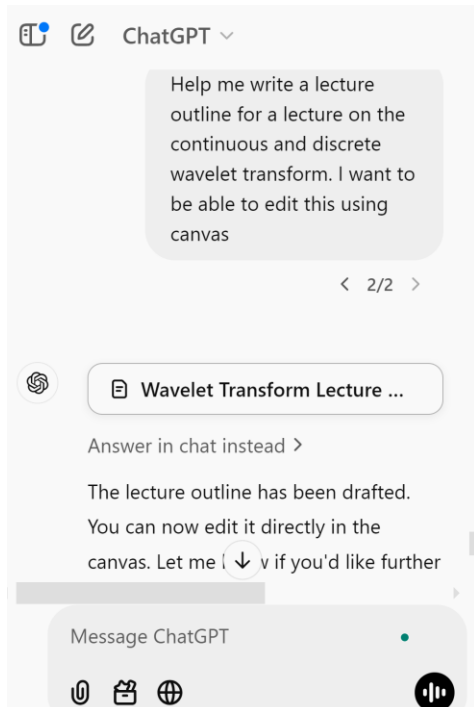
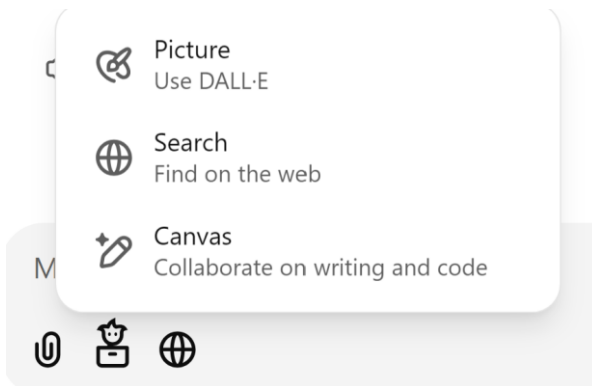
- If the data is confidential, includes personal information, or pertains to unpublished research, **do not upload it to AI tools, unless you know their privacy policy!**

Scientific writing AI tools

General AI tools

ChatGPT: Collaborative Writing and Coding with OpenAI Canvas

- Use canvas to streamline writing and coding with AI support (prompt “edit in canvas”)
- easier organization of ideas and iterative refinement of content
- develop and build on your work without switching between different applications



7. Challenges and Limitations






- CWT
 - Computational cost
 - Redundancy of coefficients
- DWT
 - Choice of wavelet and levels
 - Edge effects in decomposition

8. Summary and Q&A

- Recap of key points
- Open floor for questions

ChatGPT: Collaborative Writing and Coding with OpenAI Canvas

- Separate instructions from content
- Version Control (demo)
- Inline Feedback (demo)
- Others

Add emojis		Adds suitable emojis
Add final polish		It fixes typos, formatting, and structure
Reading level		Adjusts the reading level of the document from kindergarten level to graduate level
Adjust the length		Adjusts the length of the text by either condensing it by summarizing some parts of it or extending it by going into more details.
Suggest edits		Suggests edits but doesn't apply them automatically. Each suggestion will highlight the text and show the suggestion next to it, similarly to other collaborative text editors.

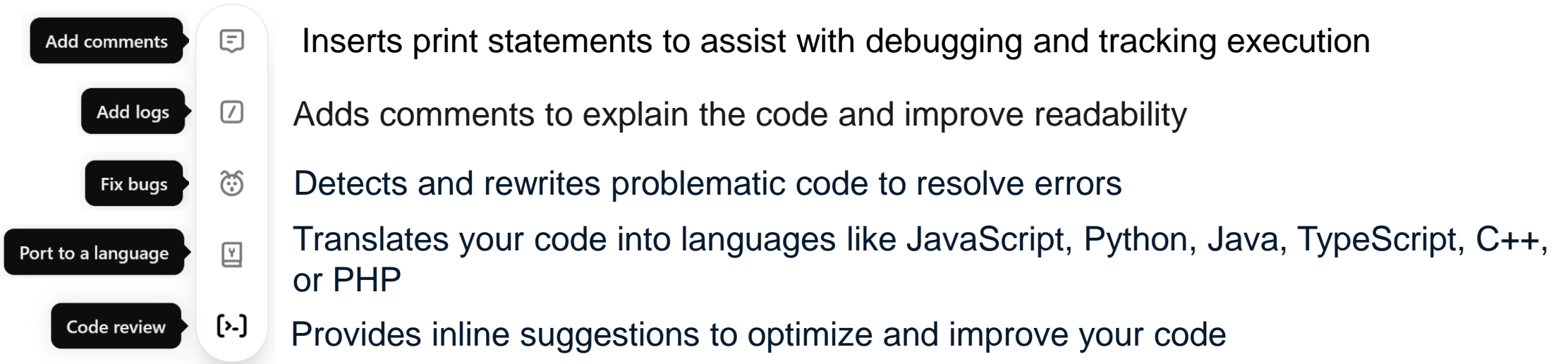
ChatGPT: Collaborative Writing and Coding with OpenAI Canvas






Reducing word count – often a necessity

- Help me shorten this discussion section for a journal paper. Use canvas for this. Please keep all quantitative data. #Insert text#
- Initial text: 948
- End text word count: 452
- Demo

ChatGPT: Collaborative Writing and Coding with OpenAI Canvas

- You can execute code canvas files for Python directly on your browser when you are using canvas by selecting the Execute button in your canvas



Add comments		Inserts print statements to assist with debugging and tracking execution
Add logs		Adds comments to explain the code and improve readability
Fix bugs		Detects and rewrites problematic code to resolve errors
Port to a language		Translates your code into languages like JavaScript, Python, Java, TypeScript, C++, or PHP
Code review		Provides inline suggestions to optimize and improve your code

Custom GPTs

They combine

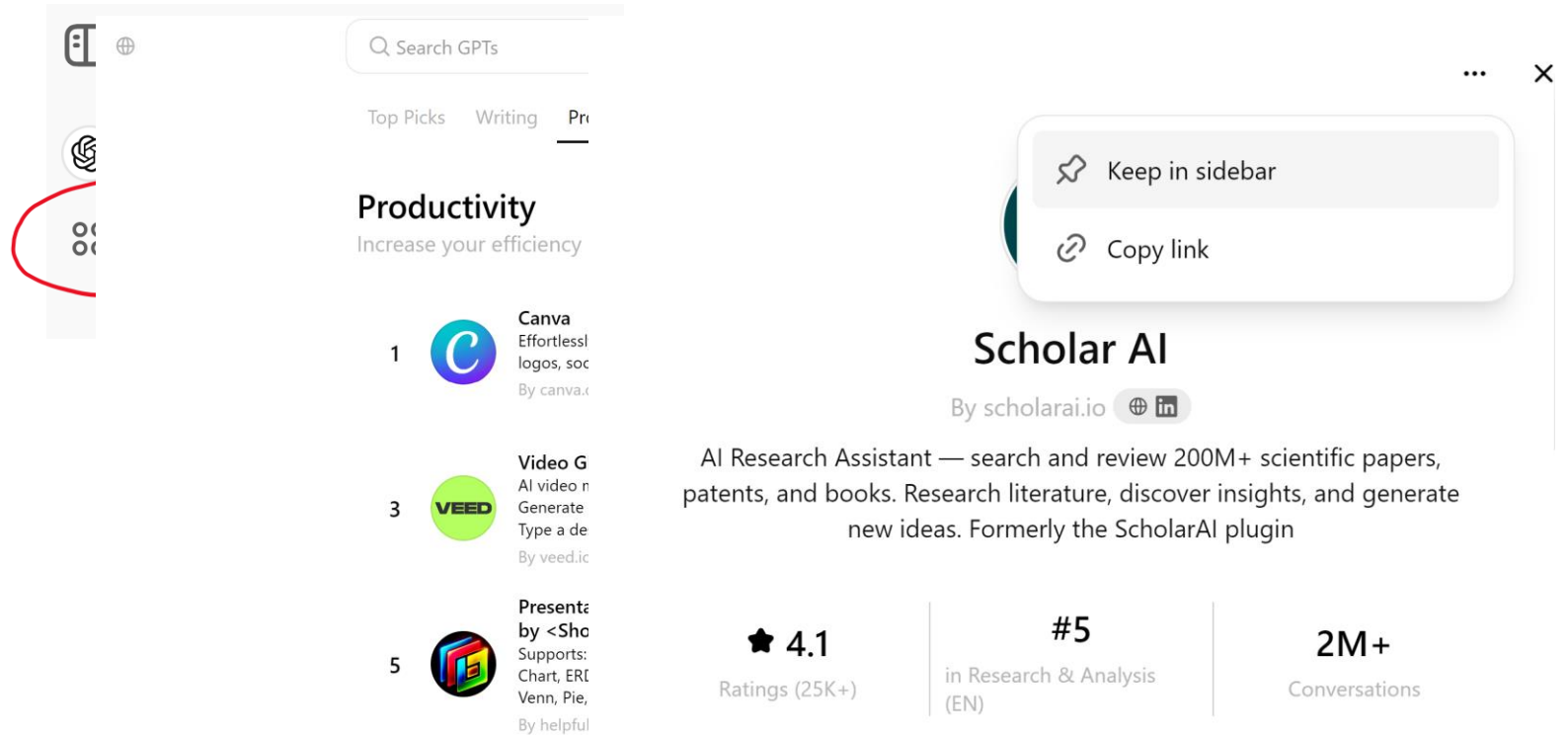
- instructions
- additional knowledge
- combination of skills

Examples

- Presentations: Canva, Presentation and Slides GPT
- Research articles: Scholar GPT, SciSpace, Consensus (access to 200m+ papers from Semantic scholar)

Use: @ and name of (pinned) customGPT

Demo



Custom GPTs

- Create a powerpoint slide deck based on this abstract ...

Answer

- **Title Slide:**
 - Title: *Advances in Machine Learning for Stress Detection Using Wearable Sensor Data*
 - Subtitle: *Generalization Challenges and Ensemble Model Solutions*
- **Slide 1: Introduction**
 - Importance of wearable sensors for stress detection.
 - Challenges: Generalization, physiological variance, and dataset limitations.
 - Objectives of the study.
- **Slide 2: Challenges in Stress Detection**
 - Physiological and psychological complexity of acute stress responses.
 - Lack of large, labeled public datasets for model training.
 - Generalization limitations of models trained on small datasets.

Demo

Would you like me to proceed with online research for images and create the first set of slides? I can create three slides initially, including visuals and speaker notes, and share them for review.



yes please, create all 8 slides

Great! I'll create all 8 slides, each with detailed content, visuals, and speaker notes. I'll generate the slides three at a time to ensure they're accurate and fit your needs. Let's start with the **Title Slide** and **Slides 1-2**.

○ Presentation and slides GPT: costs 10USD per month to download editable version

Introduction

Challenges and Objectives



Significance of Wearable Sensors

Wearable devices track biomarkers linked to stress, enabling real-time health insights.



Progress in Machine Learning
Machine learning models analyze sensor data to detect elevated stress levels.



Persistent Challenges
Generalization issues, dataset limitations, and physiological variance hinder robust model development.

Challenges in Stress Detection

Understanding Variability and Data Constraints



Physiological and Psychological Complexity

Stress responses vary widely, influenced by both measurable biological and subjective psychological factors.



Dataset Limitations

Publicly available datasets are often small and lack sufficient labeling for robust model development.



Generalization Issues

Models struggle to predict stress accurately on new, unseen data due to physiological variance.

Scientific writing AI tools

Specific AI Tools

AI Research Tools

○ Use cases

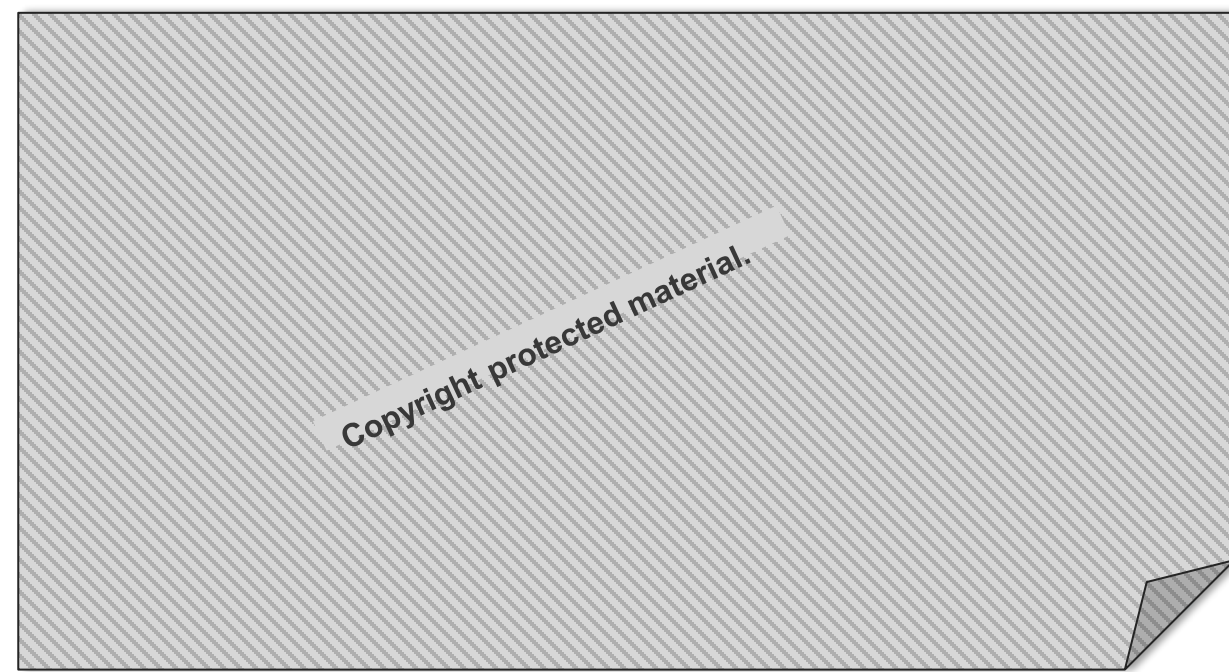
- translations and reformulations
- exploratory search for new perspectives
- paper summarization
- systematic reviews

○ Advanced Search Methods

- Combine traditional keyword search with AI-powered semantic search which accounts for word variation for comprehensive results

○ Curated Databases

- access structured databases of varying sizes and selection criteria, ensuring no hallucinations (data quality and relevance)



Translation and more: DeepL



Translate text
33 languages



Translate files
.pdf, .docx, .pptx



DeepL Write
AI-powered edits

Detect language ▼



English (American) ▼

Glossary

Type to translate.

Drag and drop to translate PDF, Word (.docx), and PowerPoint (.pptx) files with our document translator.

reset

apply

Translation and more: DeepL

Input text

Electroencephalogram (EEG) denoising is a critical preprocessing step aimed at enhancing the signal quality by removing artifacts and noise, which can obscure the neural information of interest. Artifacts such as eye movements, muscle activity, cardiac signals, and external electrical interference often contaminate EEG recordings, compromising their interpretability and the reliability of downstream analyses. Advanced denoising methods, including Independent Component Analysis (ICA), Wavelet Transform (WT), and machine learning-based approaches, have been developed to address these challenges.

Academic

Electroencephalogram (EEG) denoising is a critical preprocessing step aimed at enhancing the signal quality by removing artifacts and noise, which can obscure the neural information of interest. Artifacts such as eye movements, muscle activity, cardiac signals, and external electrical interference often contaminate EEG recordings, compromising their interpretability and the reliability of downstream analyses. **To address these challenges, researchers have developed advanced denoising methods,** including Independent Component Analysis (ICA), Wavelet Transform (WT), and machine learning-based approaches.

Exploratory search

Tool	Key Features	Notes
Research Rabbit	Visualizes citation & author networks, Zotero integration	Helps explore connections between papers and authors
Connected Papers	Generates visual graphs of related papers	Useful for identifying clusters of related work
Litmaps	Interactive citation maps, auto-updates, forward citation tracking	Ideal for visualizing and monitoring research field evolution over time
Semantic Scholar	AI-powered smart search, highlights influential papers	Enhances search relevance with citation and semantic analysis
Dimensions AI	Research database with publications, grants, patents, trials	Provides a comprehensive research landscape with funding and impact data

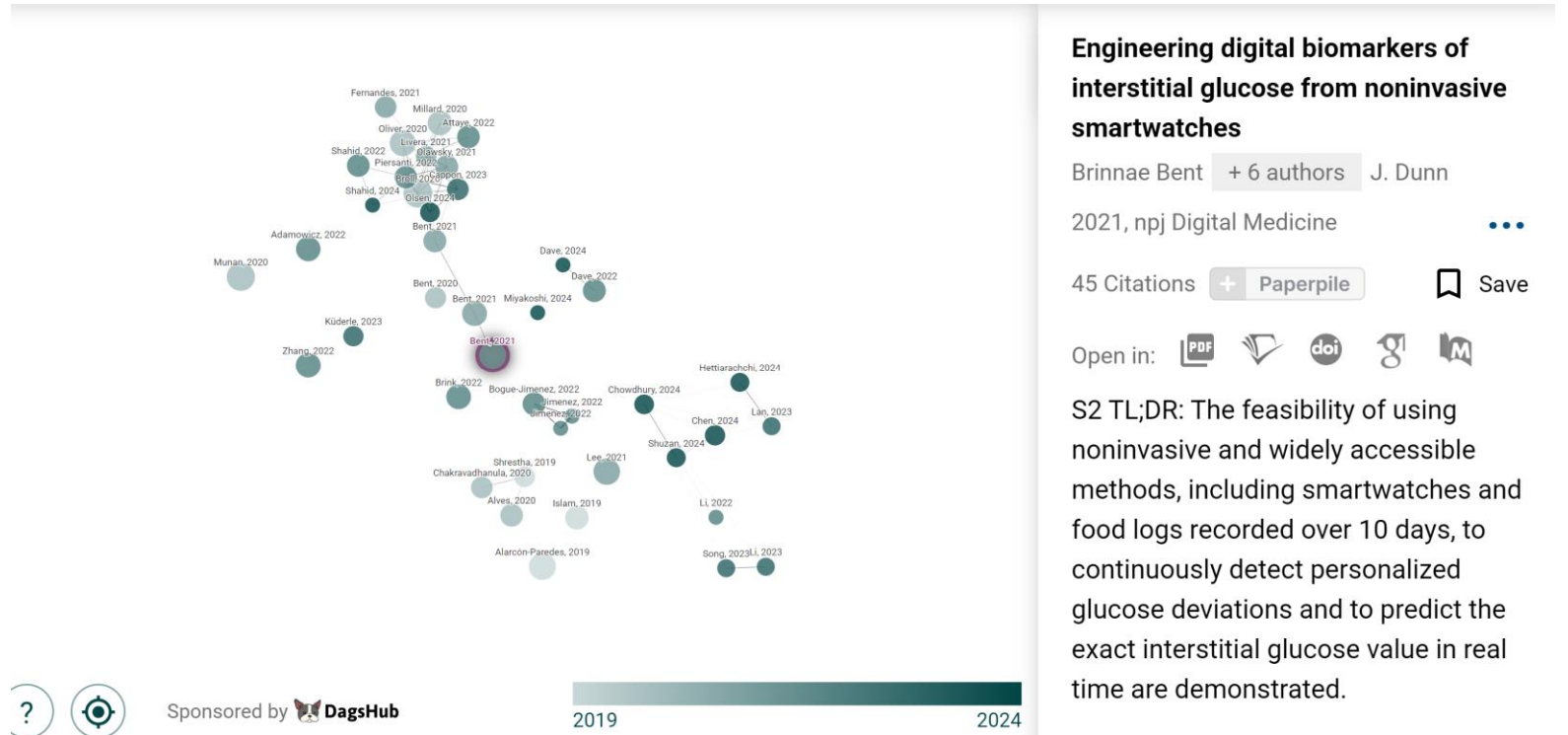
Connected papers

o <https://www.connectedpapers.com/>

How to read the graph

Each node is an academic paper related to the origin paper.

- Papers are arranged according to their similarity (this is not a citation tree)
- Node **size** is the number of citations
- Node **color** is the publishing year
- **Similar** papers have strong connecting lines and cluster together

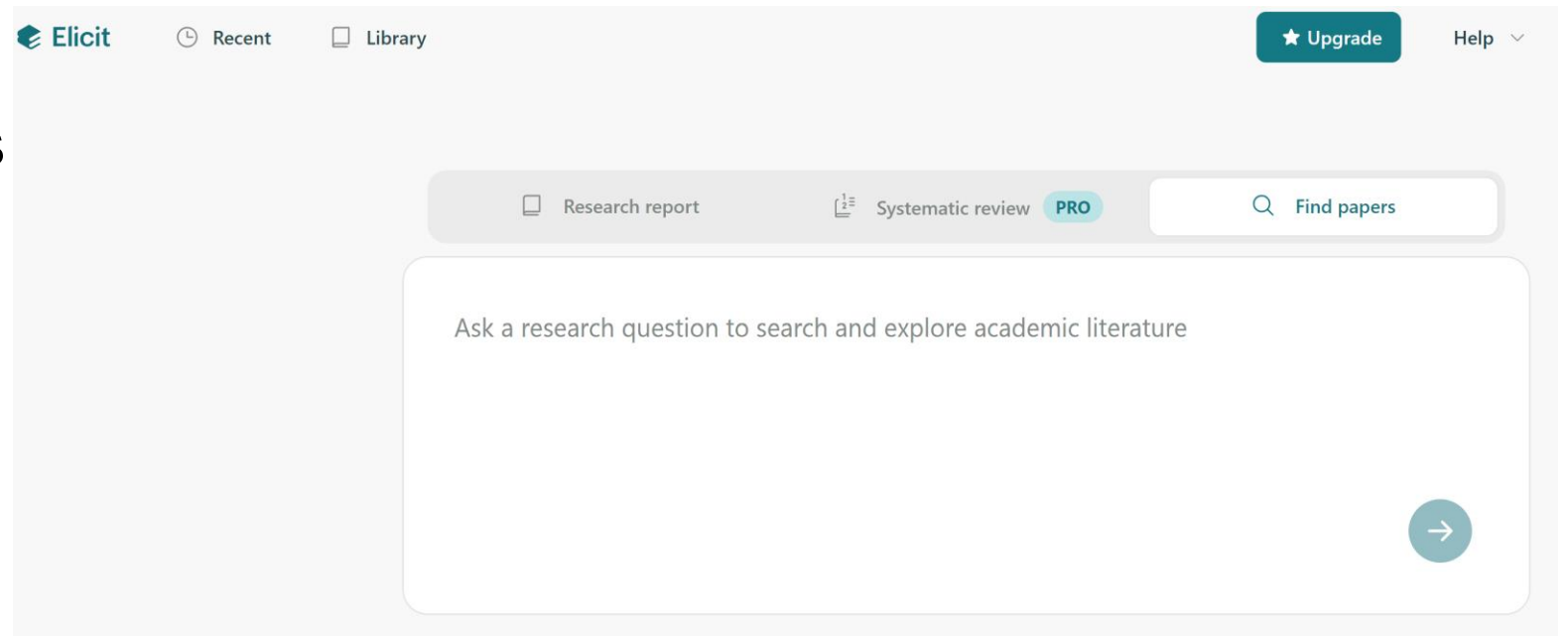


Summarization and understanding

Name	Key Features	Notes
Elicit	Research summarization and data extraction	Automated literature review, Finding relevant papers, Summarizing findings
Scite.ai	Helps evaluate citation credibility	Smart Citations with context, Browser extension
Consensus	Ideal for understanding consensus in literature	AI-powered search, Evidence-based answers, AI summarization
SciSpace	Streamlines research process	Semantic search, Interactive PDF analysis
Explainpaper	Simplifies complex papers	Highlight confusing text, AI explanations

Elicit

- Find and summarize papers
 - searches over 126 million academic papers from the Semantic Scholar
- Extract data from all papers
- Create research reports
- Create systematic reviews



Elicit find and summarize papers

- Navigate to Elicit's website (<https://elicit.com/>) and create a free account
- Prompt: "What are the latest developments in [your research area]?"
- Explore the summary, cited sources and refine your query if needed

Seizures and EEG Features in Post-Cardiac Arrest Outcomes

Share

▽

Summary of top
4 papers ▾

Copy


Seizures following cardiac arrest are associated with poor neurological outcomes ([Crepeau et al., 2013](#); [Jadeja, 2021](#); [Brooks & Park, 2018](#); [Lybeck et al., 2017](#)). Clinical seizures, particularly myoclonic seizures, are common post-arrest and highly predictive of poor prognosis ([Lybeck et al., 2017](#)). Other EEG features correlating with poor outcomes include nonreactive background, epileptiform discharges, and background suppression ([Crepeau et al., 2013](#); [Brooks & Park, 2018](#)). Additional clinical factors linked to poor outcomes are prolonged cardiopulmonary resuscitation, out-of-hospital arrest, abnormal arterial pH and lactate levels, and absent pupillary, motor, and brainstem reflexes ([Brooks & Park, 2018](#)). Early and late seizures are equally predictive of poor outcomes, and seizure treatment does not necessarily improve outcomes ([Crepeau et al., 2013](#); [Lybeck et al., 2017](#)). However, EEG should not be used in isolation to guide management. Patients with seizures or status epilepticus may still have favorable outcomes ([Jadeja, 2021](#); [Lybeck et al., 2017](#)).


↓ Add new step

Elicit extract data from papers

- Simply upload papers of interest
- Can extract up to two data metrics / columns in the free version

More tools

 Upload and extract

 Summarize concepts

Manage Columns

Search or create a column

Describe what kind of data you want to extract

e.g. Limitations, Survival time

CURRENT COLUMNS

Summary  >

Accuracy  >

ADD COLUMNS

+ Main findings

+ Methodology

+ Intervention

 Edit custom column

Tell Elicit more about this column to improve accuracy. [Get guidance and examples here.](#)

Column name

Accuracy

Instructions (optional)

What are the accuracy metrics and their values for evaluating the proposed approach

Answer Structure










Any answer

Specified

Yes/No/Maybe

Elicit extract data from papers

○ Demo


<input type="checkbox"/> Paper	Summary  	Accuracy  
<div data-bbox="63 506 104 544"><input type="checkbox"/></div> <div data-bbox="142 506 792 625"> Utilizing Mask R-CNN for Automated Evaluation of Diabetic Foot Ulcer Healing Trajectories: A Novel Approach </div> <div data-bbox="142 646 450 678">  Naveen Sharma +3 </div> <div data-bbox="142 696 450 728">  Traitement du signal </div> <div data-bbox="142 746 364 778">  ts_40.04_28.pdf </div> <div data-bbox="142 796 318 828"> 2023 · 1 citation </div>	<p>The paper presents a novel approach to automated evaluation of diabetic foot ulcer (DFU) healing trajectories using a Mask R-CNN model applied to fused thermal and visual images, which enables precise segmentation and characterization of the ulcer and surrounding regions to monitor the healing process.</p>	<ul style="list-style-type: none"> - Training loss and validation loss for the ulcer wound segmentation (Figure 6a, 6b) - Predicted validation accuracy for the ulcer wound segmentation (Figure 6c) - Training loss and validation loss for the plantar foot segmentation (Figure 7a, 7b) - Predicted validation accuracy for the plantar foot segmentation (Figure 7c) - Correlation between the proposed U:F ratio and the ground truth provided by the expert using the Woundly system, which was found to be at an average of 92.50%.
<div data-bbox="63 1019 104 1056"><input type="checkbox"/></div> <div data-bbox="142 1019 848 1093"> Affine Registration of Plantar Foot Thermal Images with Diagnosis </div> <div data-bbox="142 1115 450 1146">  Asma Aferhane +3 </div> <div data-bbox="142 1165 848 1196">  Affine Registration of Plantar Foot Thermal Images with Deep </div> <div data-bbox="142 1215 356 1246"> Citations unknown </div>	<p>The paper presents three deep learning methods for affine registration of plantar foot thermal images, with the goal of finding an accurate and fully convolutional neural network suitable for a database of thermal images of diabetic feet, and found that the Affine ConvNet and DLIR (affine part) models produced the best results with a Dice score of 95%.</p>	<ul style="list-style-type: none"> - Dice Similarity Coefficient (DSC): DLIR (Affine part) = 0.953, Affine ConvNet = 0.9512, AIRNet = 0.946 - Peak Signal-to-Noise Ratio (PSNR): DLIR (Affine part) = 28.85, Affine ConvNet = 28.62, AIRNet = 27.35

Elicit research reports



- fully automated, research-backed answers
 - based on literature review
 - search
 - screening
 - data extraction
 - to write the Report
 - each claim in the Report is supported by quotes from the underlying papers
 - hallucination free (but not misinterpretation free)
 - can chat with the report
- Can be edited in the pro version

Elicit research reports

Demo


Get a research report

How does blood flow restriction training compare to traditional resistance training exercise in muscle strength development?

Great question!

Choose the level of rigor and speed that best suits your research question.

- Fast

Screen top 50 papers · Extract from up to 10 papers
- Balanced **PLUS**

Screen top 500 papers · Extract from up to 25 papers
- Comprehensive **PLUS**

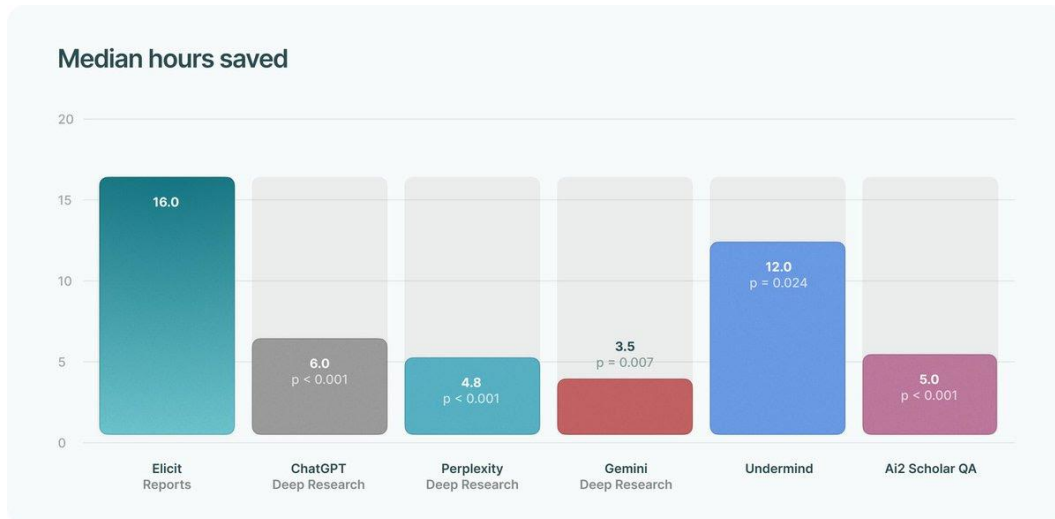
Screen top 500 papers · Extract from up to 40 papers

We are going to use up to **10 paper extractions** from your remaining **20** in this billing cycle to generate this report

Elicit research reports

- Formulate a Research Question
- Develop a specific research question pertinent to your field of study
 - For example: "How does blood flow restriction training compare to traditional resistance training exercise in muscle strength development?"
 - Analyze and rate results in terms of references, abstract and extracted data

Elicit research reports

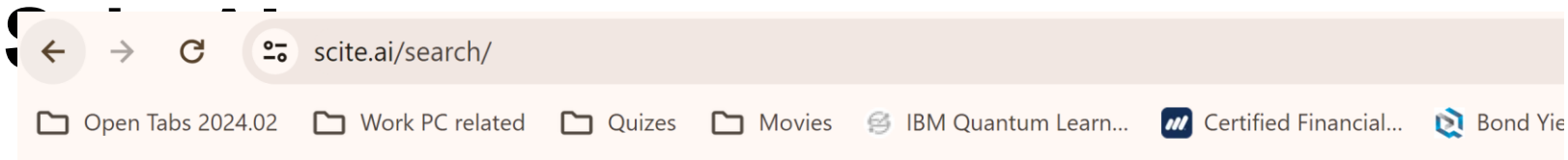


https://blog.elicit.com/elicit-reports-eval/?utm_source=email

SciteAI

Literature Review & Analysis

- global database with 100+ million research articles
- smart citations: see if a paper supports, mentions, or contrasts your work
- AI literature review: generates summaries of research topics
- extract data from papers
- Scite Index & Badges: papers with more supporting citations get a higher credibility index
- reference check: ensure the reliability of your own citations



scite_

Assistant Product

Search term(s)

Search mode

Search by title, author, keywords or DOI



▼ All

Authors ▼

Year ▼

Sections ▼

Types ▼

Citations ▼

Journal ▼

Affiliation ▼

Pub Type ▼

CASE REPORTS
PATENTS
STUDIES

Authors ▼

Year ▼

Sections ▼

Types ▼

Citations ▼

Journal ▼

Affiliation ▼

Pub Type ▼

Topics ▼

Editorial Notice



MeSH ▼

More

175,571,978 results (0.92 seconds)

[Help me](#)

“...Bereits zum 65. und 70. Geburtstag wurde Prof. Rolf Eligehausen in der Zeitschrift Beton- und Stahlbetonbau gewürdigt [1,2]. N vor ist er in der Normungsarbeit aktiv, in der Erarbeitung von Bemessungsvorschriften für den Eurocode 2, aber auch als Chairman Rahmen der fib-Arbeitsgruppe SAG 4....”

Section: Rolf Eligehausen – Der Pionier Der Befestigungstechnik Wird ...

☐ unclassified ⓘ

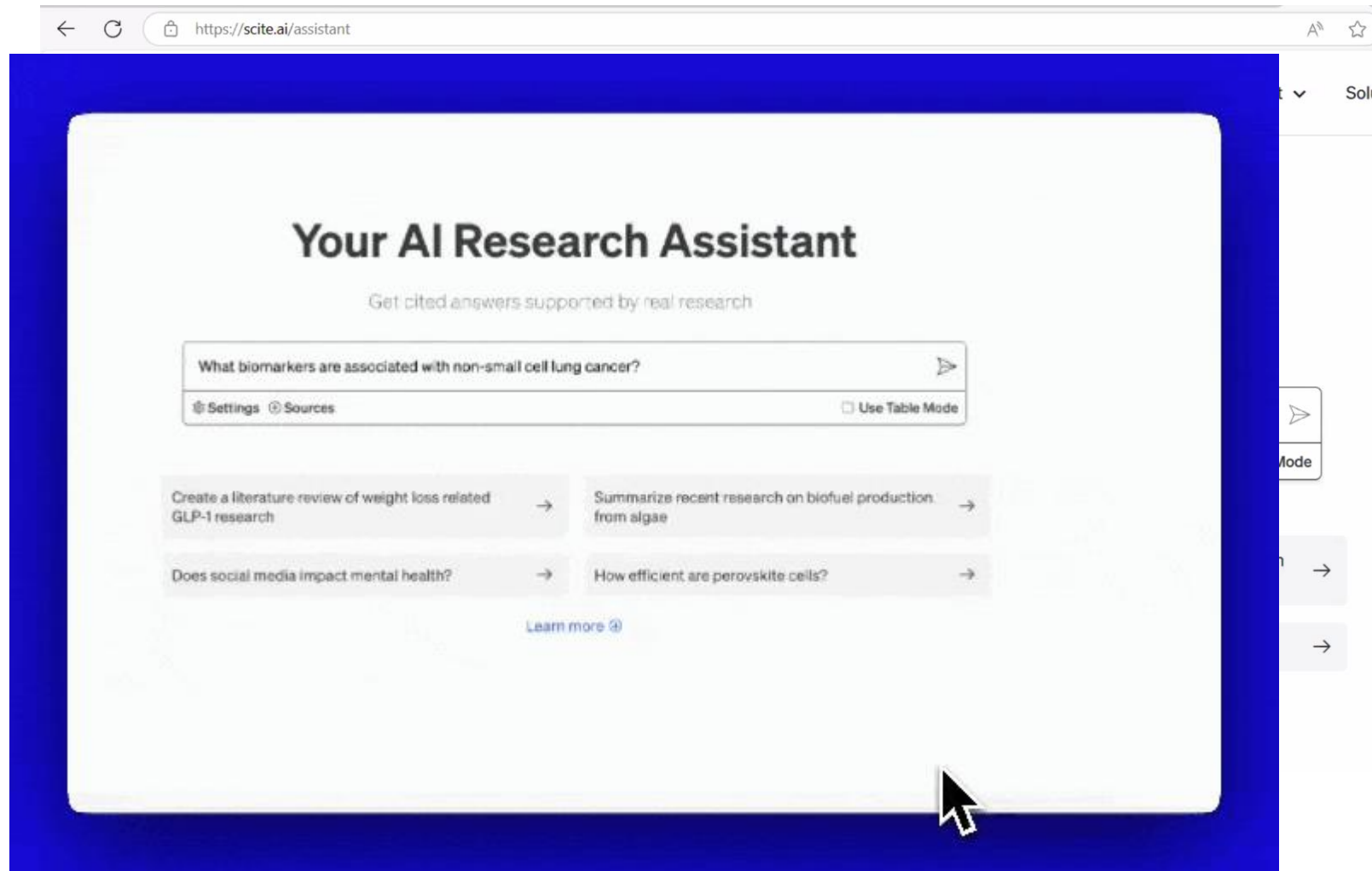
<input type="checkbox"/>	Retracted	74,186
<input type="checkbox"/>	Has Expression Of Concern	3,271
<input type="checkbox"/>	Has Correction	189,193
<input type="checkbox"/>	Has Erratum	238,582
<input type="checkbox"/>	Withdrawn	19,804

SciteAI

- Go to SciteAI search: <https://scite.ai/search/landing>
- Search for a claim in your field: Instead of just a broad concept, formulate a specific question or claim you're interested in. "E.g. Is vitamin D supplementation effective in preventing respiratory infections?".
- Explore the Citation Statements (supporting, contrasting, mentioning) Demo
- Go to SciteAI assistant: <https://scite.ai/assistant>
- Prompt: "What are the latest developments in [your research area]?"
- Explore the cited sources and refine your query if needed needed
- Rate both results

SciteAI

- Extract data from papers



SciteAI

- Upload pdf – do reference check
- Shows editorial concern references
- Main plus: citation statements

This publication referenced 40 papers in 46 statements Order By: Editorial concern

Plasmodium Circumsporozoite Protein Promotes the Development of the Liver Stages of the Parasite show abstract

[Singh¹](#), [Buscaglia²](#), [Wang³](#) et al, 2007 *Cell* Has erratum 2008-4-18

202 | 6 | 196 | 4 | 1

[View full text](#) [Add to dashboard](#) [Cite](#)

See how it was used (1 reference statement)

The Malaria Cell Atlas: Single parasite transcriptomes across the complete *Plasmodium* life cycle show abstract

[Howick¹](#), [Russell²](#), [Andrews³](#) et al, 2019 *Science*

269 | 36 | 397 | 2

[View full text](#) [Add to dashboard](#) [Cite](#)

See how it was used (1 reference statement)

Epidemiology and Infectivity of *Plasmodium falciparum* and *Plasmodium vivax* Gametocytes in Relation to Malaria Control and Elimination show abstract

[Bousema¹](#), [Drakeley²](#) 2011 *Clin Microbiol Rev*

665 | 43 | 787 | 2

[View full text](#) [Add to dashboard](#) [Cite](#)

SciteAI

○ Create custom dashboard

- From DOIs
- From Zotero
- From search

Create Custom Dashboard

You can fill out the form below to create a custom dashboard that aggregates information from scite on a group of DOIs. You may include for example a set of papers on a subject area, related to a drug, or anything else you wish. You can also [create a dashboard from a search](#).

Any dashboards you make will be saved and accessible directly from your user profile.

Import your zotero or  MENDELEY library

Name*

Description

(Optional) Tell us a little bit about the dashboard; what is it describing?

DOIs*

DOIs entered manually can be comma separated, or new-line separated (if for example you are copying over an Excel column). Please ensure that only DOIs are provided here (i.e. no headers or additional data).

Consensus

- Uses a research database of over 200 million articles
 - Included publishers: Springer Nature, Science, Wiley, IEEE, IOP, and other
 - Includes all of PubMed

- For a detailed overview, please see

<https://help.consensus.app/en/articles/10055108-consensus-research-database>

- Combines keyword search with vector (semantic) search
- Uses a relevance score with other parameters to rank results
 - citations count
 - study design

Last accessed 2025.05

Consensus

- Go to: <https://consensus.app/>
- Type a yes/no style research question

×

☐ Pro
 Filter
Share

Consensus Meter Beta

Results from 9 relevant papers

Yes 56%
Possibly 0%
Mixed 11%
No 33%

Some studies suggest that L-carnitine supplementation, especially when combined with other compounds like creatine and leucine, can increase muscle mass and improve physical performance, while other studies indicate that L-carnitine alone may not significantly affect muscle strength or composition.

2015

2010

2005

2000

1990

Exclude Preprints

Only show peer reviewed papers

Open access

Ask Paper available Beta

Citations \geq

Min 1

Methods

Journals

Consensus

do seizures correlate with poor clinical outcomes for brain recovery post-cardiac arrest? what other EEG clinical features correlate with poor clinical outcomes?



Consensus Meter

Beta

Results from 6 relevant papers



EEG Features Correlating with Poor Outcomes

- **EEG Background Suppression:** Suppression or burst-suppression patterns on EEG are highly specific indicators of poor outcomes, especially when not confounded by sedative use ^{1 9 10}.
- **Unreactive EEG:** Lack of EEG reactivity is a strong predictor of poor outcomes ².
- **Highly Malignant EEG Patterns:** These patterns, including suppression and burst-suppression, have high specificity for poor outcomes, although their sensitivity is limited ⁹.
- **Epileptiform EEG Patterns:** Early epileptiform EEG patterns often indicate poor prognosis, but specific features like background continuity and reactivity can help identify patients who might regain consciousness ⁸.

Demo

Seizures are indeed correlated with poor clinical outcomes. Several EEG features are associated with poor outcomes.

Seizures and Poor Outcomes

- Clinical seizures, including myoclonic and tonic-clonic seizures, are associated with poor neurological outcomes. Myoclonic seizures, although there are rare cases with good outcome ³.
- Status epilepticus (SE) and unreactive EEG backgrounds are strongly associated with poor functional outcomes and in-hospital mortality ^{2 4}.

Conclusion

Seizures and specific EEG features, such as background suppression and unreactive patterns, are significant predictors of poor neurological outcomes following cardiac arrest. While seizures are a grave sign, EEG provides a nuanced view that can help in prognostication, especially when combined with other clinical assessments.

↓ Results

Consensus

Research Hub

Uploaded Papers

Lists

5 uploads

Cardiac physiology for biomedical engineering

Early identification of gradual ST segment distance may prevent cardiac arrest, and bioimpedance can help differentiate between normal changes and arrhythmias in implantable devices.

Ask this paper

2019 · Gabriela Meira de Moura Rodrigues et al. · International Journal of Advanced Engineering Research and...

+ New List

Consensus

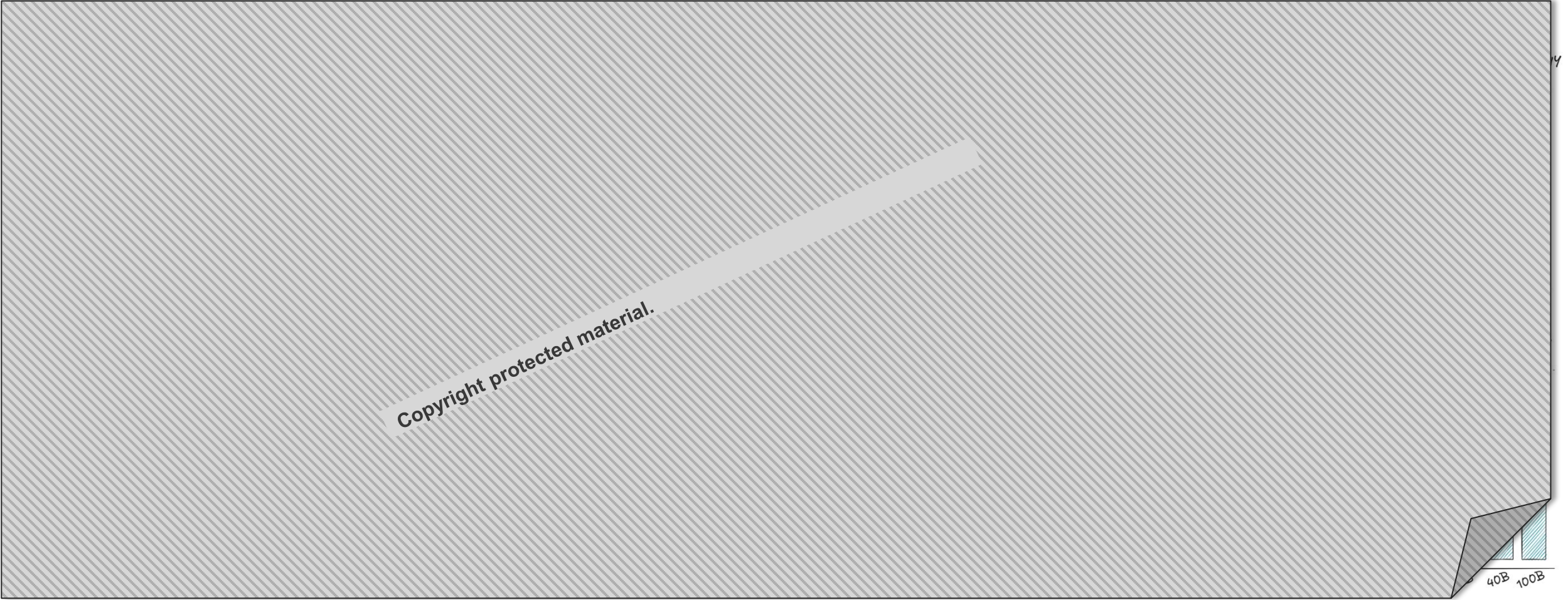
- Traditional literature search: search for a query, then refine, search again and so on
- Consensus Threads: a new way to interact with literature that transforms disconnected searches into flowing conversations

Example use case

- https://consensus.app/search/do-glp-1-agonists-reduce-addictive-behavior/eaA91k1mRAa_587GwS8FQw/
- https://consensus.app/search/does-social-media-use-affect-teenage-mental-health/dexHum9QRO-2uYc1iiKN_w/

Locally hosted LLMs

LLMs vs SLMs

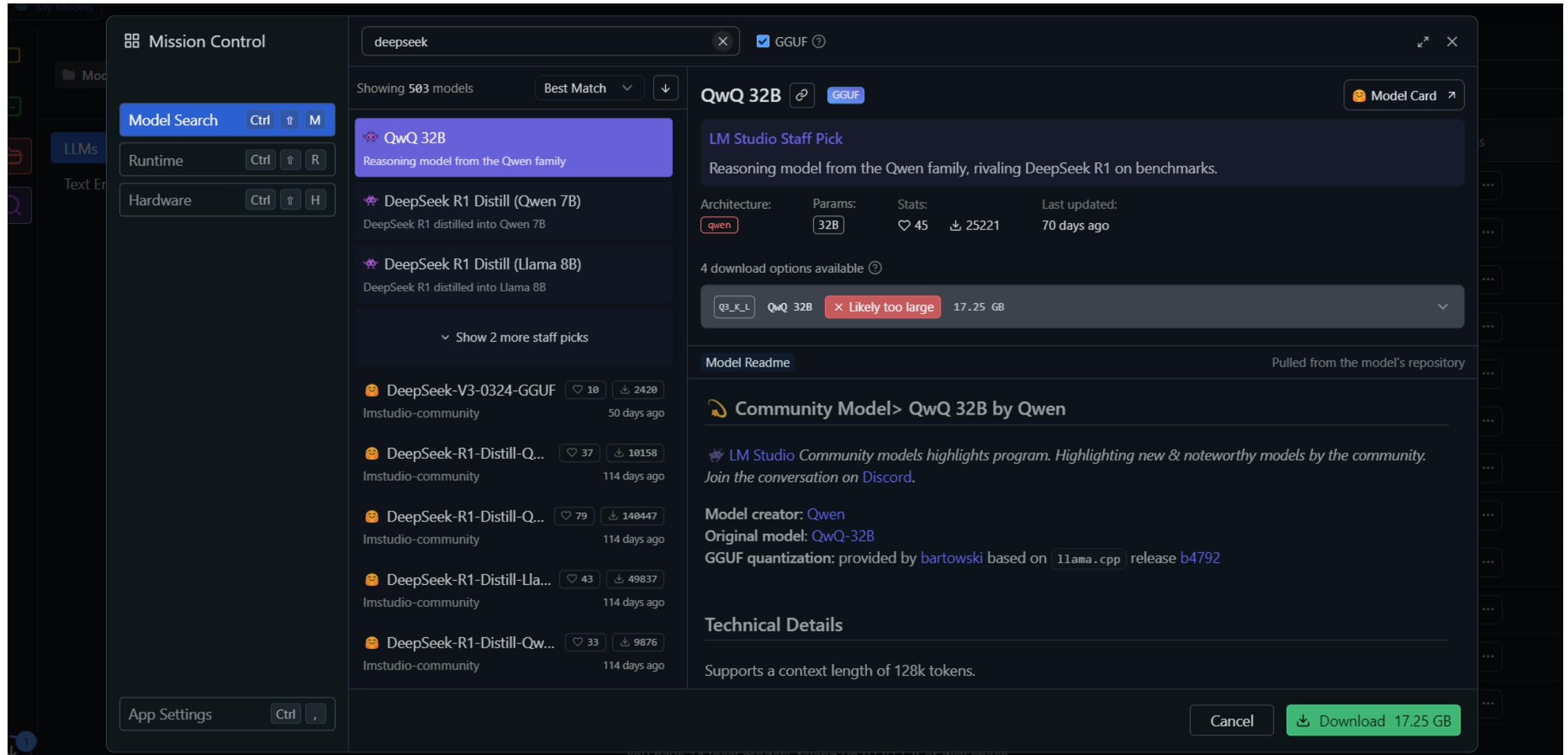


<https://towardsdatascience.com/your-company-needs-small-language-models-d0a223e0b6d9/>

Locally hosted models

- Running language models on your own hardware offers
 - privacy
 - offline access
 - customization
- Software Options:
 - LM Studio
 - Ollama
 - GPT4All
 - Nvidia ChatRTX
 - Jan

LM Studio: Model search



The screenshot displays the LM Studio Mission Control interface. On the left, a sidebar contains navigation options: 'Model Search' (highlighted), 'Runtime', and 'Hardware'. The main panel shows search results for 'deepseek' with 503 models found. The top result is 'QwQ 32B', a reasoning model from the Qwen family. Below it are several 'DeepSeek R1 Distill' models. The right panel provides detailed information for the selected 'QwQ 32B' model, including its architecture (qwen), parameters (32B), stats (45 hearts, 25221 downloads), and last update (70 days ago). It also shows 4 download options, with the first being 'Q3_K_L' (17.25 GB) and a warning 'Likely too large'. The bottom right features a 'Download 17.25 GB' button and a 'Cancel' button.

Mission Control

deepseek

Showing 503 models

Best Match

QwQ 32B

Reasoning model from the Qwen family

DeepSeek R1 Distill (Qwen 7B)

DeepSeek R1 distilled into Qwen 7B

DeepSeek R1 Distill (Llama 8B)

DeepSeek R1 distilled into Llama 8B

Show 2 more staff picks

DeepSeek-V3-0324-GGUF

Imstudio-community

50 days ago

DeepSeek-R1-Distill-Q...

Imstudio-community

114 days ago

DeepSeek-R1-Distill-Q...

Imstudio-community

114 days ago

DeepSeek-R1-Distill-Lla...

Imstudio-community

114 days ago

DeepSeek-R1-Distill-Qw...

Imstudio-community

114 days ago

QwQ 32B

LM Studio Staff Pick

Reasoning model from the Qwen family, rivaling DeepSeek R1 on benchmarks.

Architecture: qwen

Params: 32B

Stats: 45

Last updated: 70 days ago

4 download options available

Q3_K_L

QwQ 32B

Likely too large

17.25 GB

Model Readme

Pulled from the model's repository

Community Model> QwQ 32B by Qwen

LM Studio Community models highlights program. Highlighting new & noteworthy models by the community. Join the conversation on Discord.

Model creator: Qwen

Original model: QwQ-32B

GGUF quantization: provided by bartowski based on llama.cpp release b4792

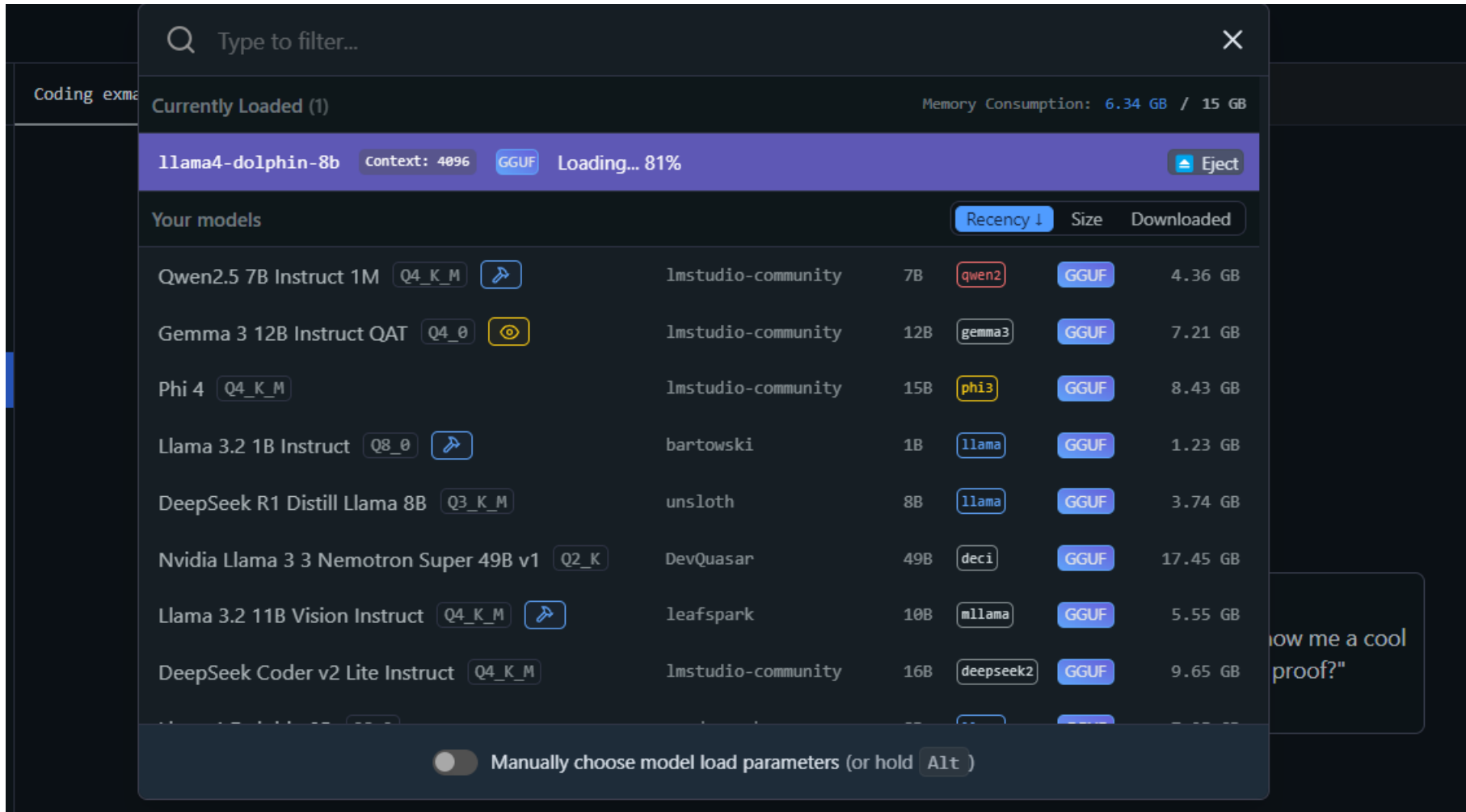
Technical Details

Supports a context length of 128k tokens.

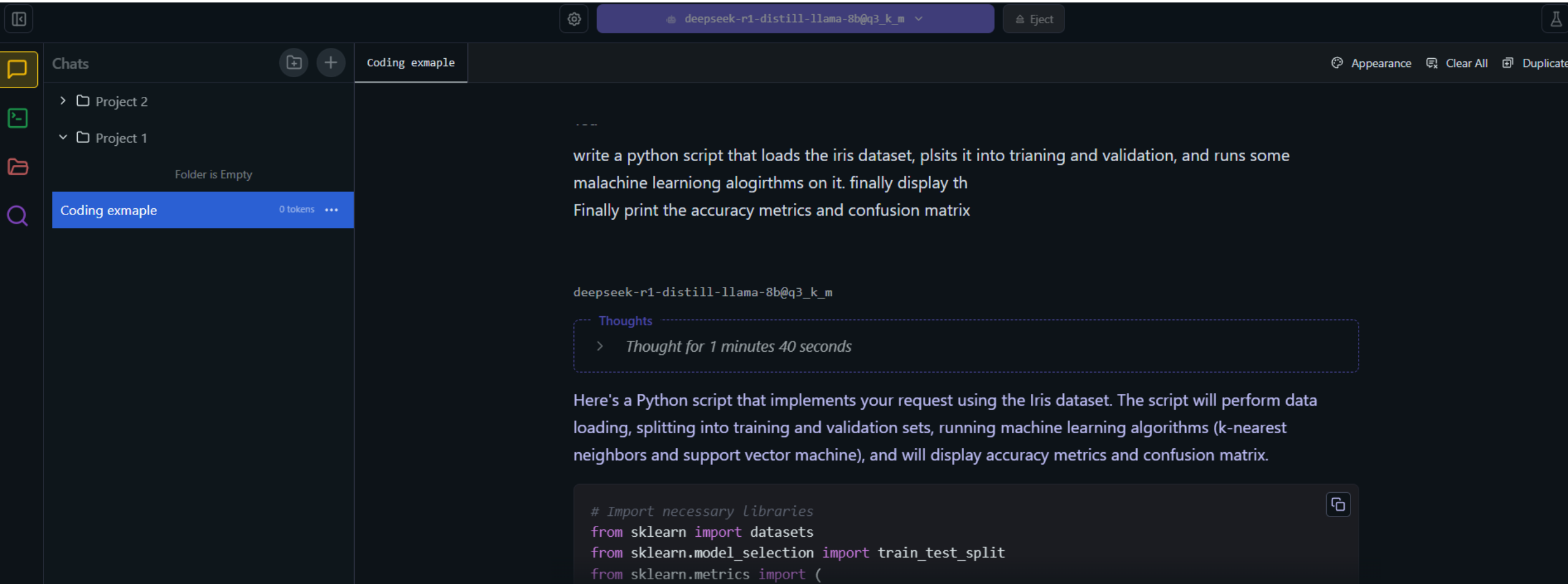
Cancel

Download 17.25 GB

LM Studio: Loading a downloaded models




LM Studio: Chat Example



The screenshot shows the LM Studio application interface. At the top, there's a header bar with a settings icon, a dropdown menu showing 'deepseek-r1-distill-llama-8b@q3_k_m', and an 'Eject' button. Below the header, the left sidebar contains a 'Chats' section with a folder tree showing 'Project 2' and 'Project 1'. The 'Coding exmaple' chat is selected, showing '0 tokens' and a menu icon. The main chat area displays a conversation with the model 'deepseek-r1-distill-llama-8b@q3_k_m'. The user's prompt is: 'write a python script that loads the iris dataset, plsits it into trianing and validation, and runs some malachine learniong alogirthms on it. finally display th Finally print the accuracy metrics and confusion matrix'. The model's response includes a 'Thoughts' section stating 'Thought for 1 minutes 40 seconds' and a detailed explanation: 'Here's a Python script that implements your request using the Iris dataset. The script will perform data loading, splitting into training and validation sets, running machine learning algorithms (k-nearest neighbors and support vector machine), and will display accuracy metrics and confusion matrix.' Below the text, a code block shows the start of a Python script: '# Import necessary Libraries', 'from sklearn import datasets', 'from sklearn.model_selection import train_test_split', and 'from sklearn.metrics import ('.

LM Studio: RAG

File Attachments and RAG



You can now chat with your own documents using Retrieval Augmented Generation (RAG). Here's how it works:

- **Attach Files:** Upload up to 5 files at a time, with a maximum combined size of 30MB. Supported formats include PDF, DOCX, TXT, and CSV.
- **Be Specific:** When asking questions, mention as many details as possible. This helps the system retrieve the most relevant information from your documents.
- **Get Responses and Experiment:** The LLM will look at your query and the retrieved excerpts from your documents, and attempt to generate a response. Experiment with different queries to find what works best.

Upload File

☐ Don't show this message again

Generative (image) models

Generative (image) Models

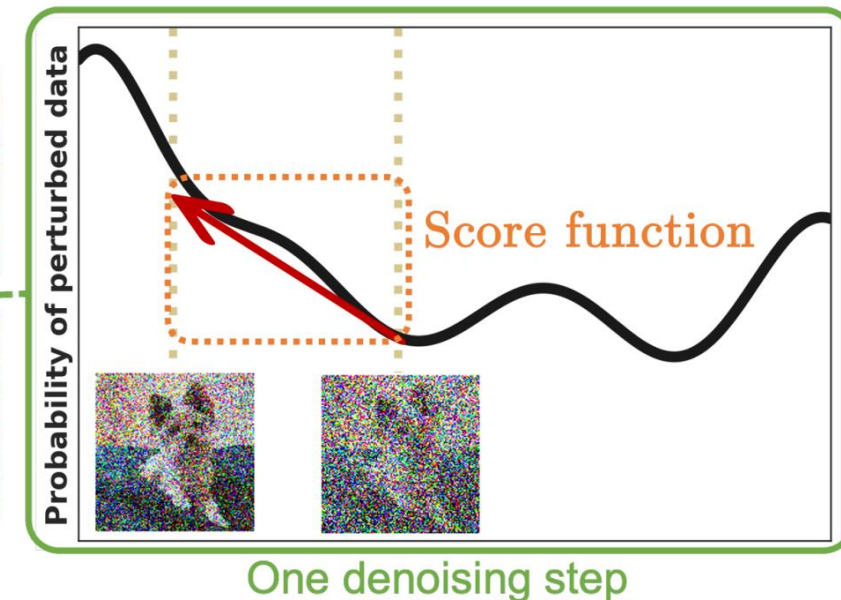
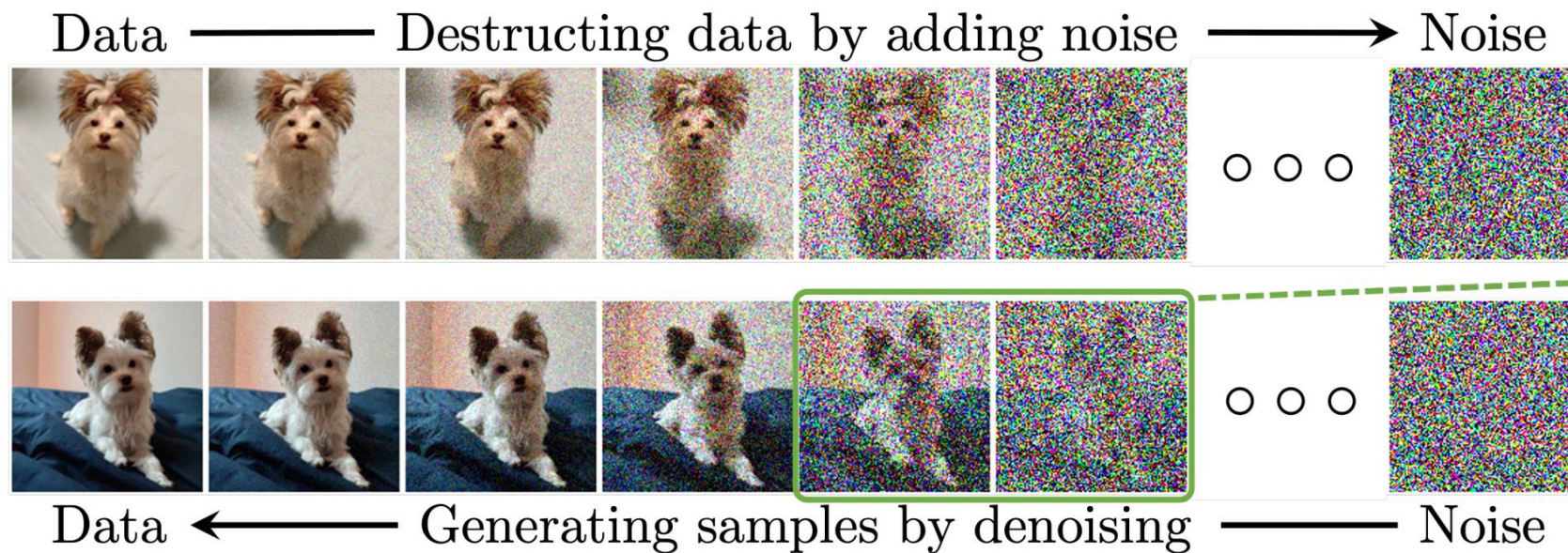
- aim to learn or approximate the underlying probability distribution of the data
 - (e.g. image data)
- primarily designed to generate new data samples that are similar to the training data (or to estimate the likelihood of data)

Examples

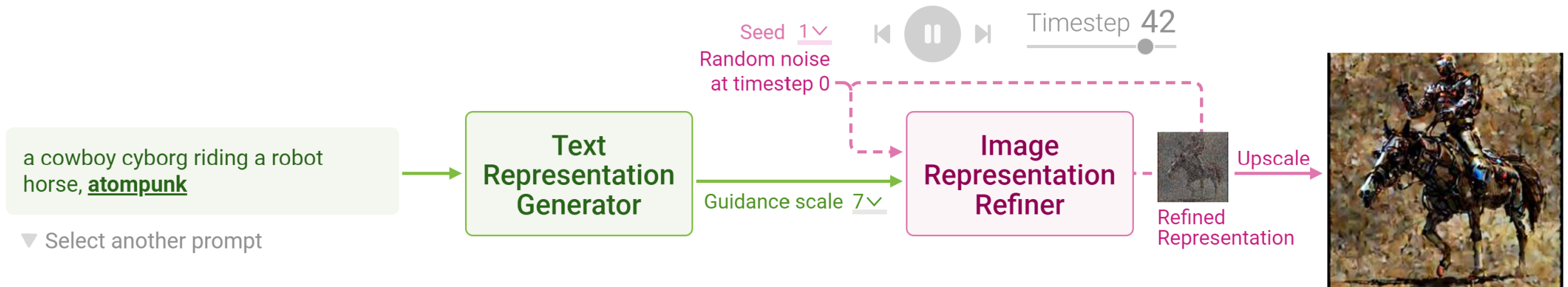
- Variational autoencoders
- Generative Adversarial Networks
- Probabilistic Diffusion Models

Generative Models: Diffusion Models

- aim to learn or approximate the probability distribution of the data
 - (e.g. image data)
- primarily designed to generate new data samples that are similar to the training data (or to estimate the likelihood of data)



Diffusion models explained <https://poloclub.github.io/diffusion-explainer/>



Lee, Seongmin, et al. "Diffusion explainer: Visual explanation for text-to-image stable diffusion." *arXiv preprint arXiv:2305.03509* (2023).

Comparison of GenAI for image generation

Name	Free	Advantages
DALL·E	Limited	Easy to use, integrated with ChatGPT, great prompt adherence and understanding, high-quality outputs
Stable Diffusion	Yes	Open-source, highly customizable, can be run locally. Online @ https://stablediffusionweb.com/app/image-generator or https://huggingface.co/spaces
Imagen (Google)	Yes	Easy to use, integrated with Gemini, high-quality outputs
Meta AI	Yes	Easy to use, integrated in WhatsApp, high-quality outputs
Leonardo.AI	Limited	Easy to use, high-quality outputs
Midjourney	Free trial	Strong community support, excels in artistic styles

Some parameters for image generation

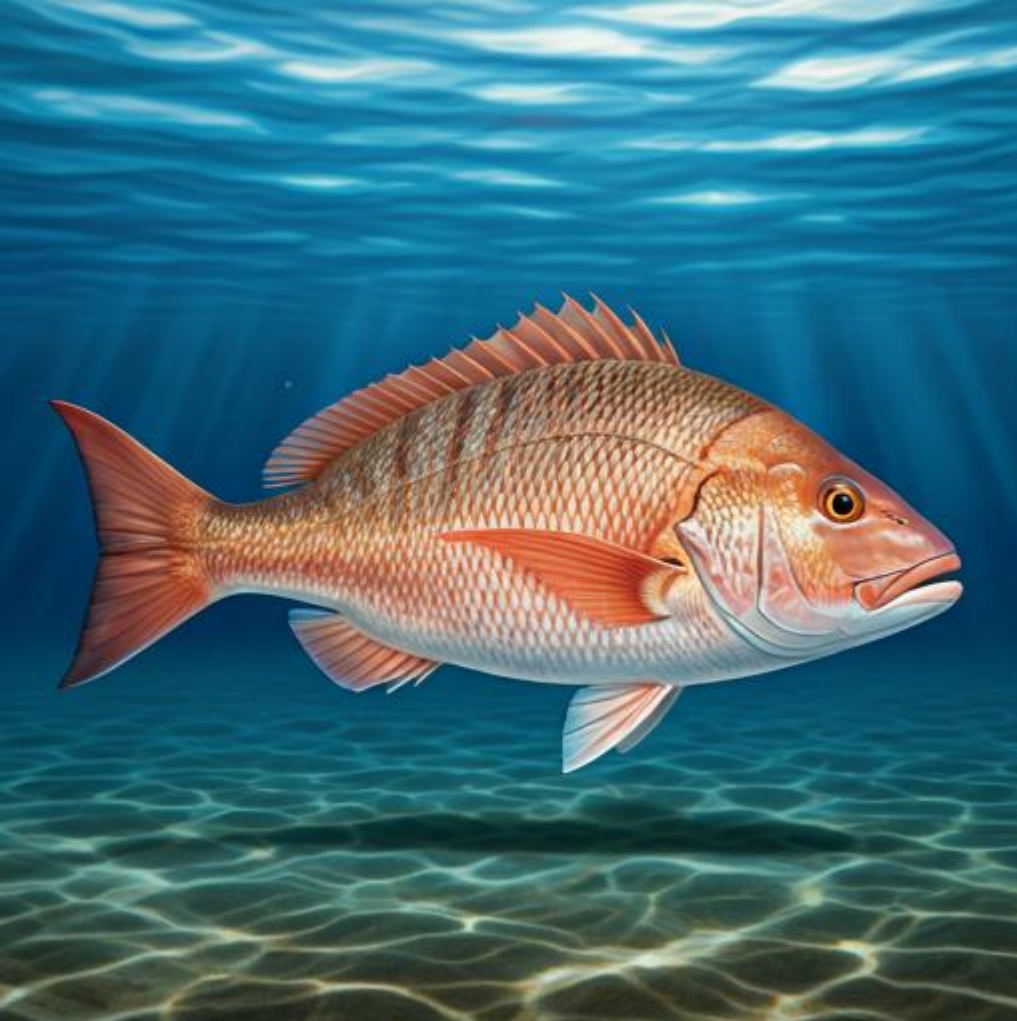
- Prompt: The input text guiding the model on what image to generate
- Negative Prompt: Specifies what elements should be excluded from the generated image
- Style: The visual or artistic genre applied to the generated image. Specified in prompt or by selecting a variation of the gen ai model
- Guidance Scale: Controls how closely the model follows the prompt versus adding creative freedom
- Steps: The number of iterations the model uses to refine and improve image quality
- Seed: A number ensuring reproducibility, producing the same image with the same input
- Aspect Ratio: The width-to-height ratio defining the shape of the generated image

Prompt good practice

- Similar rules to LLM prompting apply.
 - Be specific, clear in the image description
- Subject
 - Specify subject, e.g., animal, landscape, object
- Setting
 - Outdoor, indoor, city
- Style
 - Choose style, e.g., realistic, abstract, impressionist
- Attributes
 - Add attributes, e.g., colors, textures, lighting
- Composition
 - Define composition, e.g., close-up, wide-angle, portrait
- Background
 - Specify background, e.g., solid color, gradient, scene

Image generation in scientific writing – Gemini Imagen3

create a realistic image depicting a red snapper fish underwater



generate a realistic image of a bean sprout



Image generation in scientific writing – Imagen3



c What type of fish is this?

This appears to be a Red Snapper (*Lutjanus campechanus*), which is recognizable by its characteristic pinkish-red coloring, pointed snout, triangular-shaped dorsal fin with spines, and relatively large scales. Red snappers are popular among both commercial and recreational fishers and are known for their tender, white meat. They're common in the Gulf of Mexico and along the southeastern Atlantic coast of North America, typically living near reefs and other underwater structures.

Reply to Claude...

Claude 3.5 Sonnet  Choose style 

Image generation in publications

Example

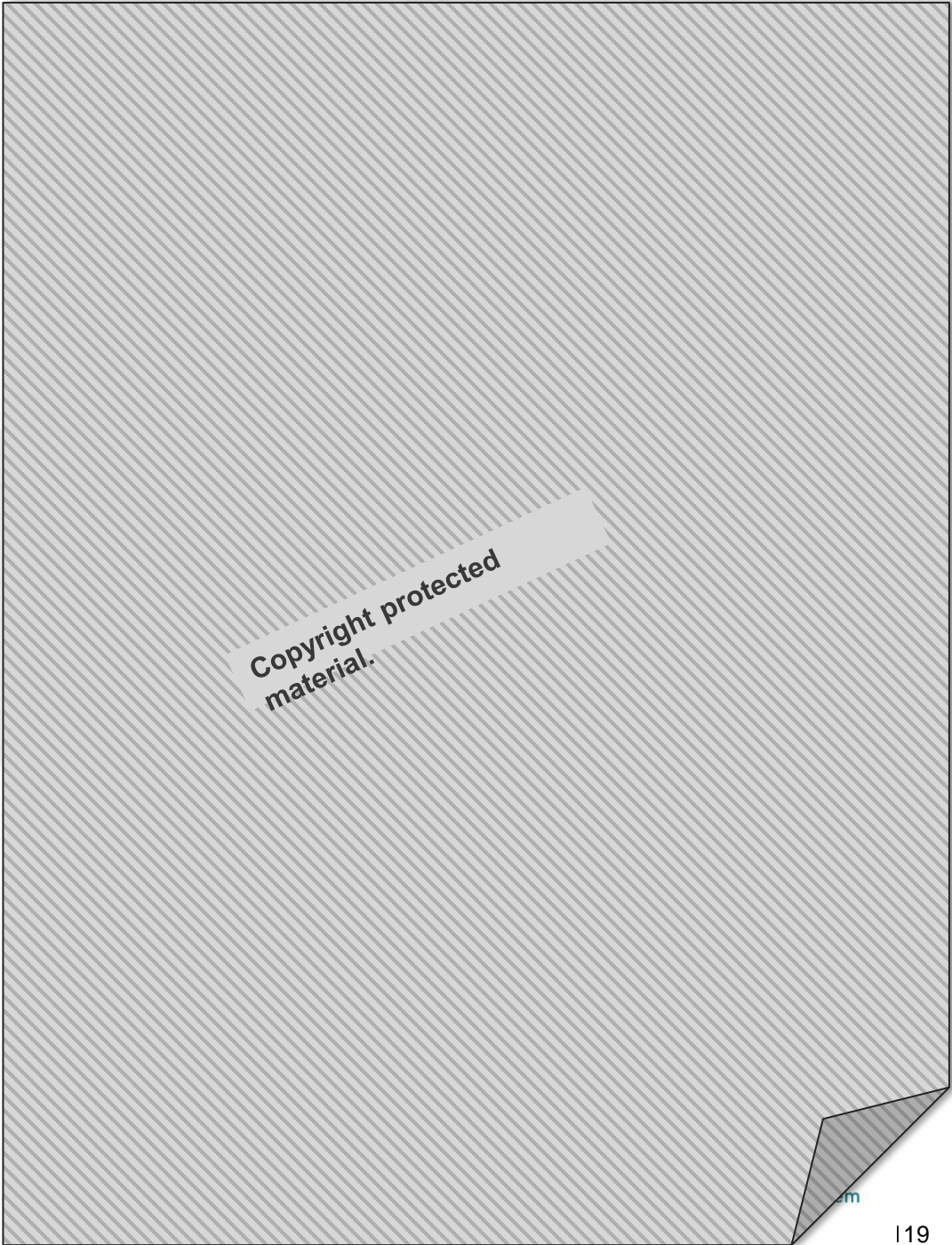
- study explores the use of generative AI to enhance public understanding of nuclear energy, by evaluating how well AI text-to-image models communicate complex information



Comparative analysis of text to image tools.pdf

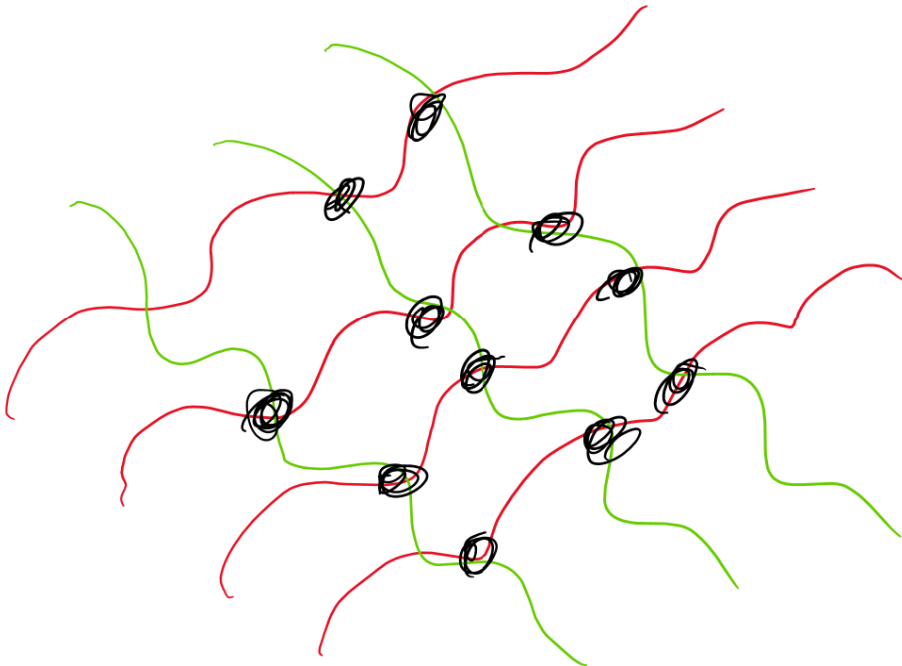
Joynt, Veda, et al. "A comparative analysis of text-to-image generative AI models in scientific contexts: a case study on nuclear power." *Scientific Reports* 14.1 (2024): 1-23.

Example AI image in Poster presentation



Sketch to image – for schematic figures

- GUI: <https://huggingface.co/spaces/HiDream-ai/HiDream-E1-Full>
- Download model and run it on you PC: <https://github.com/HiDream-ai/HiDream-E1>
- Prompt: Editing Instruction: Transform the illustration into a polished image with



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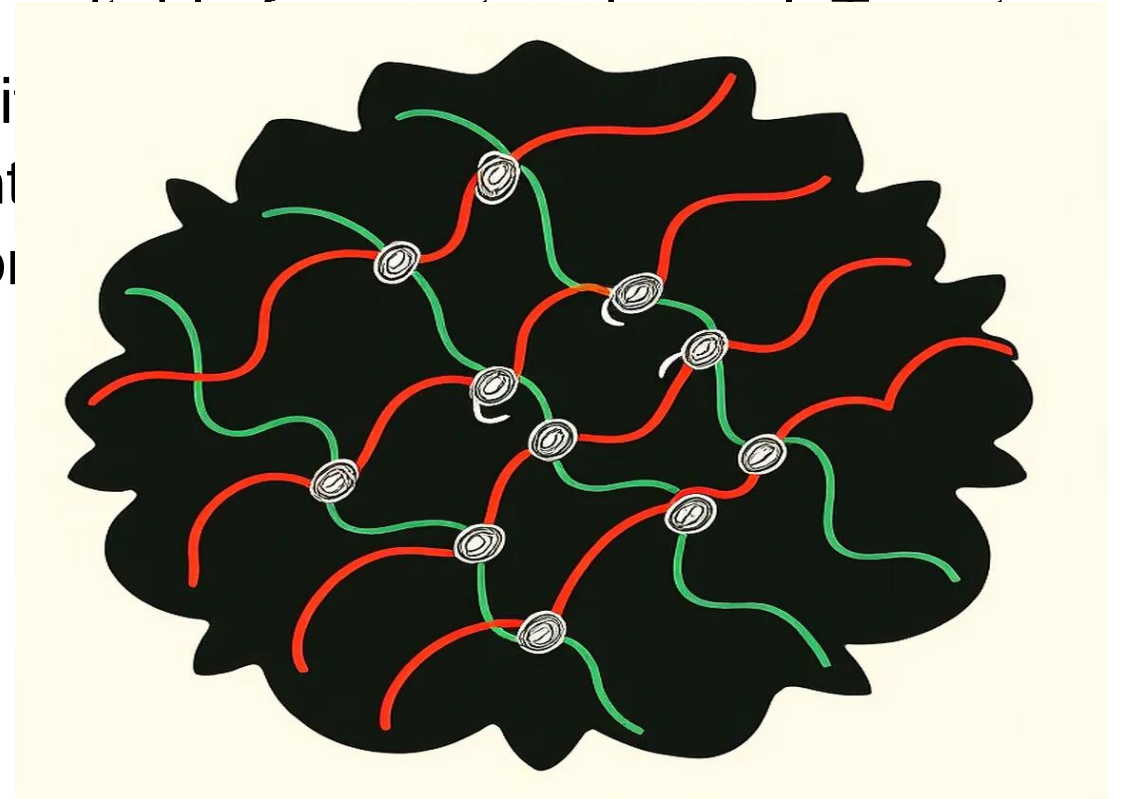
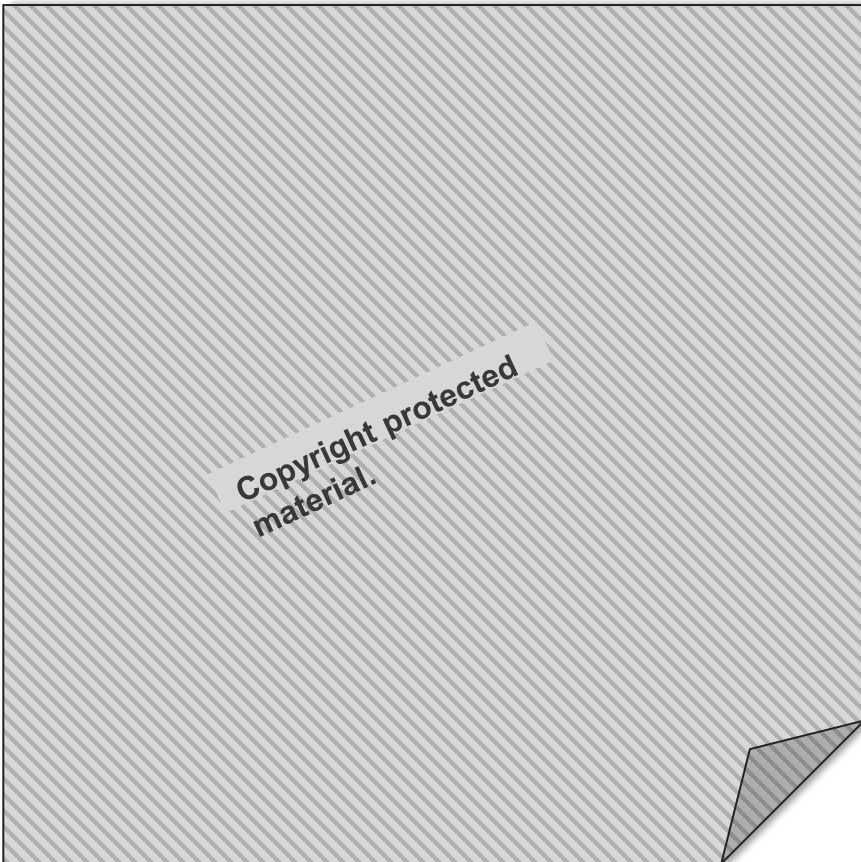


Image generation for cover illustration

- Prompt: Keep it simple. Textile glove, thin black rubber tubes on each finger. A smartphone should be close by, which has a transparent 3d hand model and highlights a particular finger



Generated with Gemini 2.5

Image generation describing (research) projects

○ Anxiety detection

○ Glucose monitoring

○ Sleep quality assessment



Example – image generation describing (research) projects

Exercise

- Generate an image that illustrates one of the following
 - your general research or work
 - a catchy image for a student thesis
 - a catchy image for a workshop or presentation related to your work
- Rate the generate images on a scale from 1 – 10
 - how accurately it followed prompt
 - lack of distortions/artifacts
 - overall quality

Limitations

- Prompt: generate an image with a frog standing on a cat standing on a cow standing on an elephant



Limitations

- Prompt: generate an image of a person with the left hand raised up, right hand tucked in the pocket, right leg raised up.



Conclusion

Conclusion

- Modern AI tools can be powerful and productivity increasing
- Chose the right tool for the right task
- Keep up to date – new tools are emerging fast
 - the best tool today might not be the best tool tomorrow
- Take data privacy in account before uploading your data to an AI model
- Critically evaluate the answer of the AI model
- AI cannot be listed as an author
- Always follow publisher guidelines on AI use
- You are responsible for using the output generated by the AI models

Thank you for your attention

Please direct any (future) questions to

Dr. Corin Otesteanu



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