

AI

ChatGPT and other tools

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Artificial Intelligence

The term 'artificial intelligence' (AI) was first coined by John McCarthy at a conference in Dartmouth in 1956. Since then, a lot has happened.

Large language models (LLM) are a type of AI and have enormous value across the entire value chain of research.

They have potential applications in the *automation of research techniques*

- Generating a hypothesis ([ChatGPT](#))
- Searching for content and get the sources ("grey" literature, laws, scientific publications; [perplexity.ai](#))
- Searching scientifically published content ([scite](#), [connectedpapers](#))
- Assist in writing scripts for QGIS (Quantum GIS) and R programming, and Excel-questions ([ChatGPT](#))
- Detecting plagiarism ([quillbot](#))
- Improving readability ([Grammarly](#), [ChatGPT](#))
- Translating ([deepl](#))
- Creating pictures for presentations / posters ([Image Creator from Bing](#))



Picture: Made with Image Creator from Bing.com

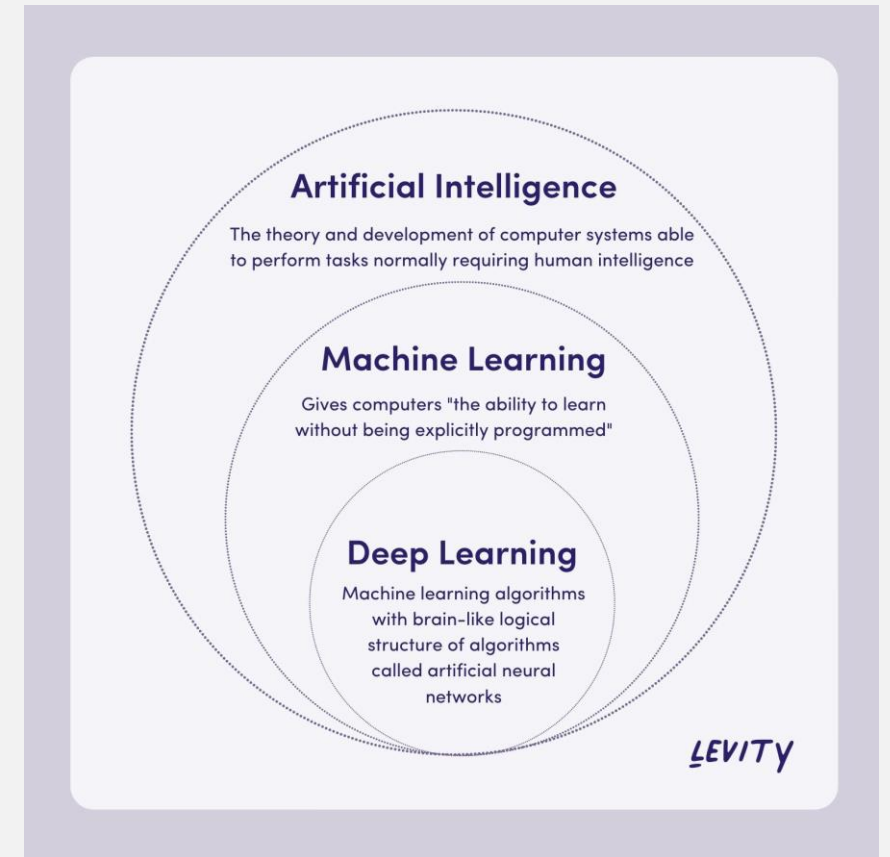
Limitations

AI relies heavily on the quality of input data and researchers need to be mindful of this fact.

Biased or incomplete datasets can lead to inaccurate insights.

Additionally, it can be extremely difficult – and sometimes impossible – to know how complex machine learning models have arrived at a particular decision.

This is known as the **‘black box’** problem and means it can be challenging for humans to understand how the model arrived at a particular conclusion or prediction based on its input data.

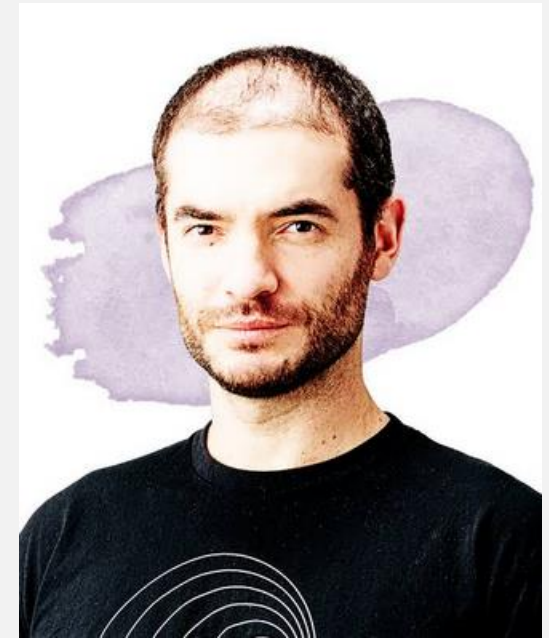


ChatGPT?

OpenAI announced the groundbreaking release of ChatGPT in 2022, an online chatbot that enables users to interact with the GPT-3.5 language model.

ChatGPT is a type of **narrow AI** (also known as weak AI) because it is designed to perform specific tasks, such as natural language processing and generation, within a defined scope. It does not possess general intelligence or self-awareness, and **its capabilities are limited to the tasks it's trained on, such as answering questions and generating text based on input.**

ChatGPT creators include **Ilya Sutskever**, chief scientist and cofounder OpenAI. His company was showered with billions of dollars by Microsoft. Among founders are Elon Musk and Amazon Web Services.



[TedTalk](#)

Trying ChatGPT

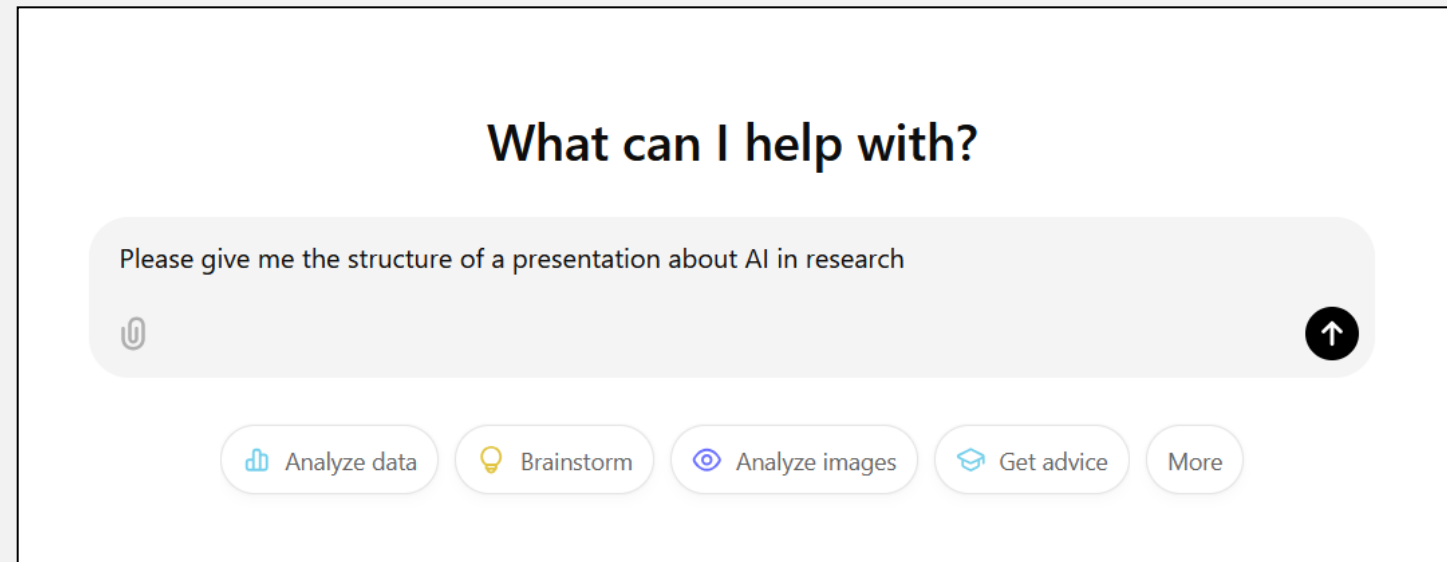
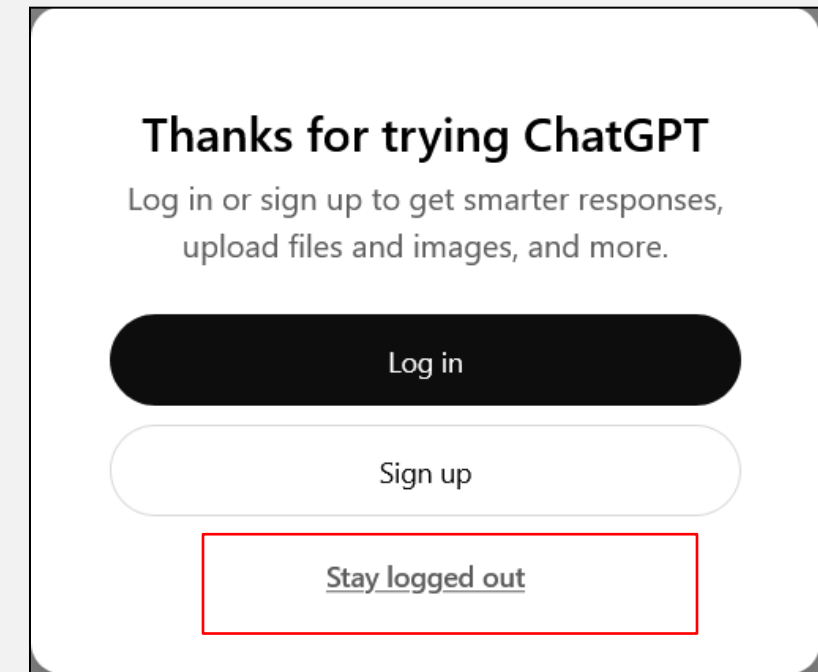
Options:

- (1) Link: webpage <https://chatgpt.com/>
- Newest update: Jan. 2025 (Version ChatGPT 4omini)
- Free

Why „Log in?“

→ More personalised and continuous support (timeline).

Not really necessary.



Trying ChatGPT

Options:

(1) Link: webpage <https://chatgpt.com/>

(2) ChatGPT Plus:

- Necessary to lock in
- 23 EUR
- Always newest ChatGPT version possible
- More “thinking processes” before answering
- Still fast and working when too many people use ChatGPT

The image shows the ChatGPT pricing page with three columns representing different subscription tiers. Each column has a title, a description, a list of features with checkmarks, a price, and a button to get the tier.

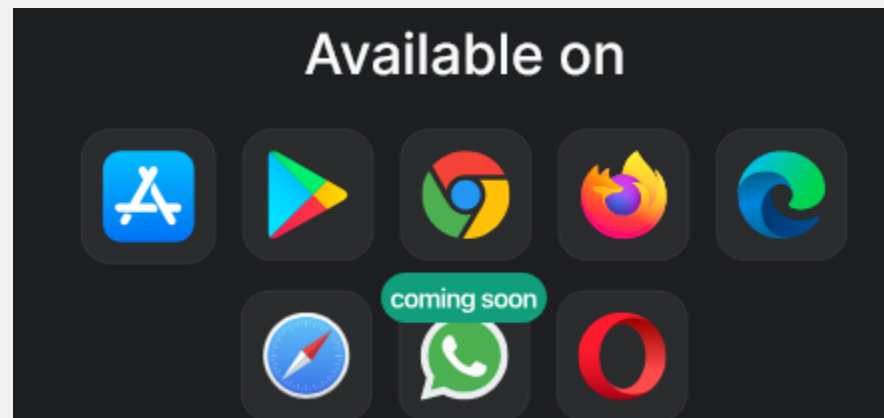
Free	Plus	Pro
Explore how AI can help with everyday tasks	Level up productivity and creativity with expanded access	Get the best of OpenAI with the highest level of access
<ul style="list-style-type: none">✓ Access to GPT-4o mini✓ Real-time data from the web with search✓ Limited access to GPT-4o and o3-mini✓ Limited access to file uploads, data analysis, image generation, and voice mode✓ Use custom GPTs <small>Have an existing plan? See billing help</small>	<ul style="list-style-type: none">✓ Everything in Free✓ Extended limits on messaging, file uploads, data analysis, and image generation✓ Standard and advanced voice mode with video and screensharing✓ Access to multiple reasoning models (o3-mini, o3-mini-high, and o1)✓ Create and use projects, tasks, and custom GPTs✓ Limited access to Sora video generation✓ Opportunities to test new features	<ul style="list-style-type: none">✓ Everything in Plus✓ Unlimited access to all reasoning models and GPT-4o✓ Access to deep research and o1 pro mode, which uses more compute for the best answers to the hardest questions✓ Unlimited access to advanced voice, with higher limits for video and screensharing✓ Extended access to Sora video generation✓ Access to research preview of Operator (U.S. only)
\$0 / month	\$20 / month	\$200 / month
Get Free	Get Plus Limits apply >	Get Pro

Trying ChatGPT

Options:

- (1) Link: webpage <https://chatgpt.com/>
- (2) ChatGPT Plus
- (3) App:

Just nicer to handle on smartphone. Same functions as web version.



Trying ChatGPT

For tutorials and problem solving:

- Incredibly helpful and time saving

Can I open an .mxd in QGIS? Please short answer, about 50 words.



No, you cannot directly open an .mxd file (ArcMap project file) in QGIS. However, you can export the .mxd to a format QGIS supports, like a QGIS project (.qgz), or manually recreate the project by adding the same data layers in QGIS.

Ah, I didn't get that. Can you explain in detail?



Sure! An .mxd file is a project file used by ArcMap, part of ArcGIS, which stores maps, layers, symbology, and other settings. Unfortunately, QGIS doesn't support opening .mxd files directly. However, there are a few workarounds:

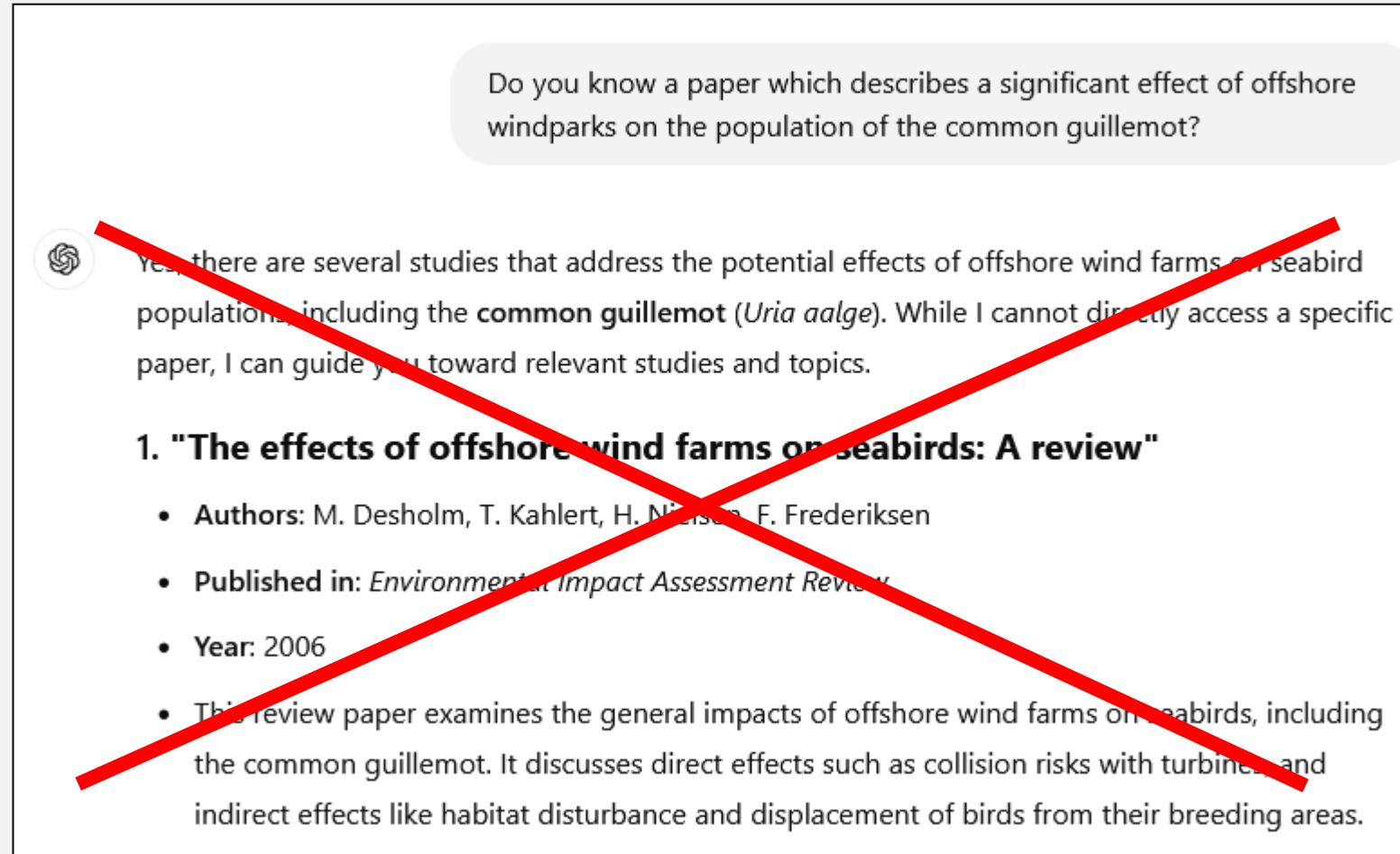
1. **Manual Recreation:** You can open the .mxd in ArcMap, export the data layers (e.g., shapefiles, GeoTIFFs, or other formats) to a folder, and then manually add those layers into QGIS. You'll have to recreate the map layout and symbology in QGIS.
2. **Using QGIS Plugins:** There are some third-party plugins, like the "ArcMap Project Importer" or "MxdReader", which attempt to convert certain aspects of an .mxd file into QGIS-readable layers.

Mistakes in ChatGPT

For literature search:

- Journal exists
- Authors exist

Paper: Doesn't exist



The screenshot shows a chat interface. At the top, a user asks: "Do you know a paper which describes a significant effect of offshore windparks on the population of the common guillemot?". Below this, the ChatGPT response is displayed, starting with a circular icon containing a stylized 'G'. The response text is: "Yes, there are several studies that address the potential effects of offshore wind farms on seabird populations, including the **common guillemot** (*Uria aalge*). While I cannot directly access a specific paper, I can guide you toward relevant studies and topics." This is followed by a numbered list item: "1. **'The effects of offshore wind farms on seabirds: A review'**". Under this title is a bulleted list: "• **Authors:** M. Desholm, T. Kahlert, H. Nielsen, F. Frederiksen", "• **Published in:** *Environmental Impact Assessment Review*", "• **Year:** 2006", and "• This review paper examines the general impacts of offshore wind farms on seabirds, including the common guillemot. It discusses direct effects such as collision risks with turbines, and indirect effects like habitat disturbance and displacement of birds from their breeding areas." A large, thick red 'X' is drawn across the entire response area, from the top of the text to the bottom, indicating that the information is incorrect or unreliable.

Do you know a paper which describes a significant effect of offshore windparks on the population of the common guillemot?

Yes, there are several studies that address the potential effects of offshore wind farms on seabird populations, including the **common guillemot** (*Uria aalge*). While I cannot directly access a specific paper, I can guide you toward relevant studies and topics.

1. "The effects of offshore wind farms on seabirds: A review"

- **Authors:** M. Desholm, T. Kahlert, H. Nielsen, F. Frederiksen
- **Published in:** *Environmental Impact Assessment Review*
- **Year:** 2006
- This review paper examines the general impacts of offshore wind farms on seabirds, including the common guillemot. It discusses direct effects such as collision risks with turbines, and indirect effects like habitat disturbance and displacement of birds from their breeding areas.

Perplexity.ai

For literature search:

- Includes grey literature
- Peer-review and **grey literature** seem to be considered equally relevant




Do you know a paper which describes a significant effect of offshore windparks on the population of the common guillemot?

❖ Quellen

[PDF] Auks in the German North Sea: Effects of Offshore Wind Farms - bwo-offshorewind

[PDF] A new method for quantifying redistribution of seabirds within ... - frontiersin

How do auks behave towards offshore wind farms? - BWO - bwo-offshorewind

   Quellen ausblenden

✎ Antwort

Yes, there are papers describing significant effects of offshore wind farms on common guillemot populations. A recent study titled "Auks in the German North Sea: Effects of Offshore Wind Farms" found notable impacts on guillemot distribution ¹ ³. The research revealed:

1. Strong seasonal differences in guillemot behavior near offshore wind farms.
2. In autumn (July to September), guillemots showed pronounced avoidance within a radius of several kilometers from wind farms.
3. Common Guillemots exhibited a 65-76% reduction in density inside wind farms and up to 1 km distance in autumn.
4. Within 5 km of wind farms, guillemot densities were reduced by 49-66% in autumn.




Another study by Peschko et al. (2024) reported even more substantial effects ¹:

1. An effect radius of 15-18 km in winter and 18-21 km in autumn for guillemots.
2. A reduction in habitat use of 67% (up to 1 km distance to offshore wind farms) in winter.
3. A 91% reduction in habitat use in autumn.

These findings indicate significant displacement and habitat loss for common guillemots due to offshore wind farms, particularly during certain seasons.

Teilen

Umschreiben

   ...

↓

+

 Fragen Sie nach

Pro

↑

❖ 8 Quellen

bwo-offshorewind - 1

The analysis of the regions separately revealed a similar seasonal pattern for both species. Model results revealed that in both species a large part of the individuals avoid...

2. [PDF] A new method for quantifying redistribution of seabirds within ...

frontiersin - 2

Four RPM subsets were defined, <2.5, >=2.5 & <5.0, >=5.0 & <7.5 and >=7.5 (the maximum recorded RPM during the study was 10.3) with bird observations assigned to one of these...

3. How do auks behave towards offshore wind farms? - BWO

bwo-offshorewind - 3

The study "Auks in the German North Sea: Effects of Offshore Wind Farms", commissioned by the German Offshore Wind Energy Association, examined the effects of...

4. [PDF] Standard-Investigation-impacts-offshore-wind-turbines-marine ...

bsh - 4

5. [PDF] Common Guillemots and offshore wind farms - Noordzeeloket

noordzeeloket - 5

Some studies have reported displacement in this species (e.g., Leopold et al. 2013; Vanermen et al. 2014; Skov et al. 2016) but others reported little or no displacement in...

6. Assessing displacement of seabirds from offshore wind farms

researchgate - 6

7. (PDF) Cumulative effects of offshore wind farms on common ...

researchgate - 7

Scite.ai

For literature search:

-Helpful but **limited** in the number of free prompts

→ Do you know a paper which describes a significant effect of offshore windparks on the population of the common guillemot?

1 free prompt(s) left. [Start your free trial](#) to get unlimited prompts.

The impact of offshore wind farms (OWFs) on the population dynamics of common guillemots (*Uria aalge*) has garnered significant attention in recent ecological studies. Research indicates that these structures can lead to substantial displacement of guillemot populations from their preferred foraging habitats, which can have cascading effects on their survival and reproductive success.

One of the critical findings is that guillemots exhibit varying degrees of avoidance of OWFs, with studies showing significant reductions in guillemot density following the construction of offshore wind farms. For instance, a study in the southern North Sea reported a 68% reduction in guillemot density at the Thorntonbank OWF and a 75% reduction at the Bligh Bank OWF (Vallejo et al., 2017). This displacement is particularly concerning as it may prevent access to vital foraging areas, which are essential for their energy intake during the non-breeding season (Buckingham et al., 2023). The non-breeding season is crucial for guillemots, as they rely on these areas for sustenance before returning to breeding colonies (Buckingham et al., 2023).

Furthermore, the cumulative effects of multiple OWFs in a region can exacerbate these challenges. Peschko highlights that the interference caused by OWFs is particularly pronounced for top predators like guillemots, which are sensitive to environmental changes and anthropogenic activities (Peschko, 2024). The displacement from foraging grounds can lead to increased energetic costs and reduced survival rates, as guillemots may have to travel further to find food, thereby increasing their vulnerability during critical periods (Trinder, 2024).

In addition to direct displacement, the ecological implications of OWFs extend to the broader marine ecosystem. The presence of wind farms can alter local prey availability and distribution, further impacting guillemot populations. For example, the interactions between guillemots and their prey species can be disrupted by changes in habitat structure and foraging dynamics induced by wind farm installations (Dunn et al., 2022). This interplay between guillemots and their environment underscores the

→ Ask a question... (type '/' for menu)

References

Search Strategy

Seabird species, are prone to interference with offshore wind farms (OWFs)...">>>

Section: Abstract

Cumulative effects of offshore wind farms on common guillemots (*Uria aalge*) in the southern North Sea - climate versus biodiversity?
Verena Peschko 2024 *Biodivers Conserv*

4

0

0

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

“...The climate crisis is driving a rapid increase in size and number of offshore wind farms to reduce carbon emissions from electricity generation. However, there are concerns about the potential impact of offshore wind farms on the marine environment. Seabirds are considered to be at risk of being displaced from preferred foraging habitat, by construction and operation of offshore wind farms, resulting in reduced energy intake or elevated energetic costs and consequent decreases in survival and/or productivity...”">>>

Section: Abstract

A new method for quantifying redistribution of seabirds within operational offshore wind farms finds no evidence of within-wind farm displacement
Mark Trinder 2024 *Front. Mar. Sci.*

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

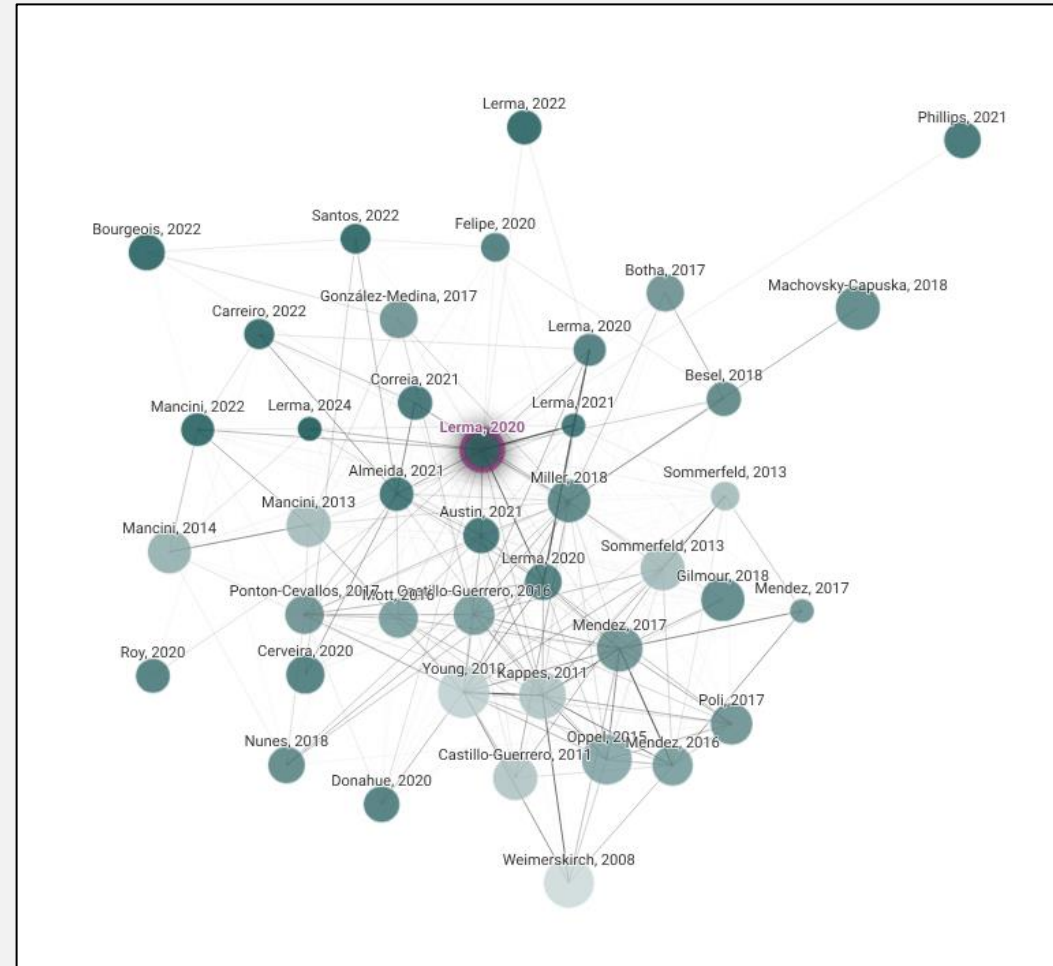
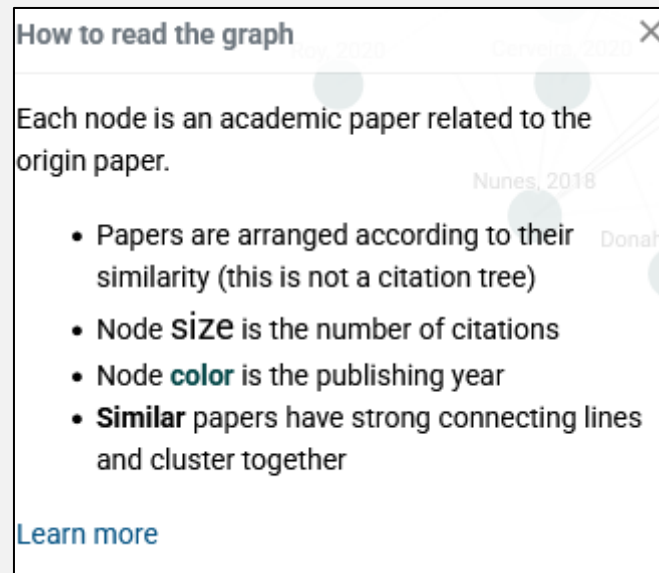
“...Locations where guillemots were lighter tended not to overlap with high energy gain areas and were instead at the edge of the...”">>>

Section: Discussion

Connected papers

For literature search:

- Helpful for literature search, but most (if not all) literature must have a **doi**.



AI Europe alternatives

- [Mistral AI](#) (France)
- [Aleph alpha](#) (Germany)



In Research: Journals

Declaration of generative AI in scientific writing

Authors must declare the use of generative AI in scientific writing upon submission of the paper. The following guidance refers only 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:

Generative AI and AI-assisted technologies should **only be used** in the writing process **to improve the readability** and language of the manuscript.

The technology must be applied **with human oversight and control** and authors should carefully review and edit the result, as AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. Authors are ultimately responsible and accountable for the contents of the work.

Authors must **not** list or cite AI and AI-assisted technologies **as an author** or co-author on the manuscript since authorship implies responsibilities and tasks that can only be attributed to and performed by humans.

The use of generative AI and AI-assisted technologies in scientific writing **must be declared** by adding a statement at the end of the manuscript when the paper is first submitted. The statement will appear in the published work and should be placed in a new section before the references list.

In Research: Reviewers

Reviews can be **discarded** if they are found to be primarily generated by an AI software.

Journals are using AI detectors to identify if the review was human generated. For example: [gptzero](#)

GPTZero's Research Contributions

GPTZero has its roots in the academic community - we started in the Princeton NLP lab in 2022 as a research initiative. We have grown since to power research in computer science, natural language processing, computational social science, pedagogy, and so on.

Researchers have used us to uncover the uncontrolled and harmful use of machine-generated text and spam in all facets of the internet, from medical research, news journalism, data labeling, news journalism, and corporate audits. We continue to support academics and researchers through scholarly access to our AI detector.



Was this text written by AI or a Human?

Try an example:

ChatGPT

Claude

Human

AI + Human

Paste your text

0/5000 characters

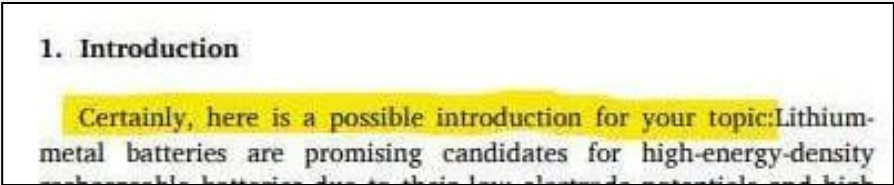
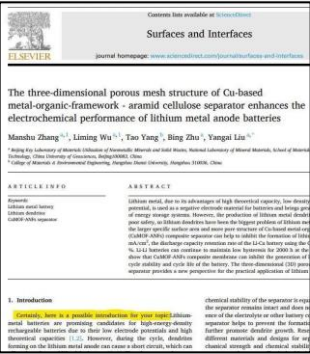
⚡ Upgrade

📁 Upload

Scan for AI →

In Research: Authors

Authors should be careful when using this technology and carefully **review and edit the result**. Authors are ultimately **responsible and accountable** for the contents of the work.



This article has been retracted: please see Elsevier Policy on Article Withdrawal (<https://www.elsevier.com/about/policies/article-withdrawal>).

In addition, there are concerns that the authors appear to have used a Generative AI source in the writing process of the paper without disclosure, which is a breach of journal policy.

The journal sincerely regrets that these issues were not detected during the manuscript screening and evaluation process and apologies are offered to readers of the journal.



access to real-time information or patient-specific data, as I am an AI language model. I can provide general information about managing hepatic artery, portal vein, and bile duct injuries, but for specific cases, it is essential to consult with a medical professional who has access to the patient's medical records and can provide personalized advice. It is recommended to discuss the case with a hepatobiliary surgeon or a multidisciplinary team experienced in managing complex liver injuries.

In Research: Authors

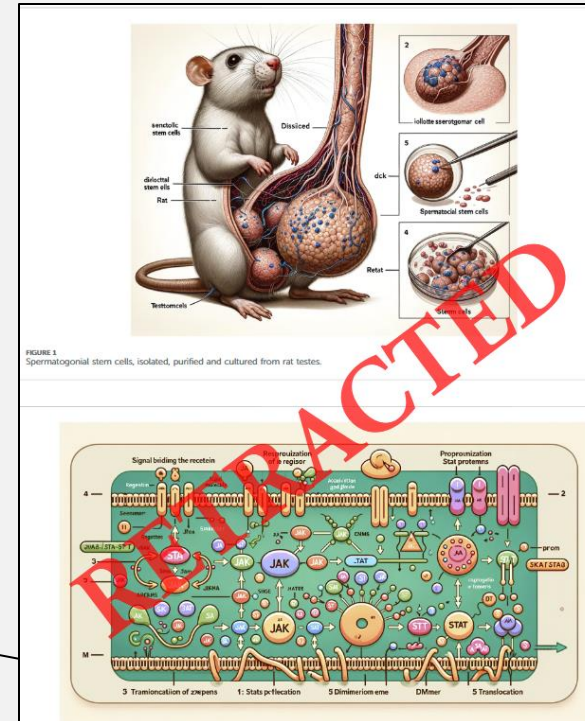
Images generated using AI also had been retracted.

3 Translocation of sperms

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

There are negative implications while using misleading images.

Generative-AI technologies can create convincing scientific data with ease – publishers and integrity specialists fear a torrent of faked science.



Source: [Frontiers](#), [Nature](#).

Potential

ChatGPT and its counterparts are here to stay. For this reason, it is crucial to understand its capabilities in the research field, as well as its limitations and potential ethical shortcomings.

AI and science: what 1,600 researchers think

A *Nature* survey finds that scientists are concerned, as well as excited, by the increasing use of artificial-intelligence tools in research.

ARTIFICIAL INTELLIGENCE >

Humans are already repeating words learned from ChatGPT, such as ‘delve’ and ‘meticulous’

An analysis of 300,000 conferences reveals that the influence of generative artificial intelligence goes beyond the written word and is now impacting what we say

Source: [Nature](#)

Source: [ResearchToAction](#)

Change in language

CHATGPT >

Excessive use of words like ‘commendable’ and ‘meticulous’ suggests ChatGPT has been used in thousands of scientific studies

A London librarian has analyzed millions of articles in search of uncommon terms abused by artificial intelligence programs

ARTIFICIAL INTELLIGENCE >

Humans are already repeating words learned from ChatGPT, such as ‘delve’ and ‘meticulous’

An analysis of 300,000 conferences reveals that the influence of generative artificial intelligence goes beyond the written word and is now impacting what we say

Environmental impacts

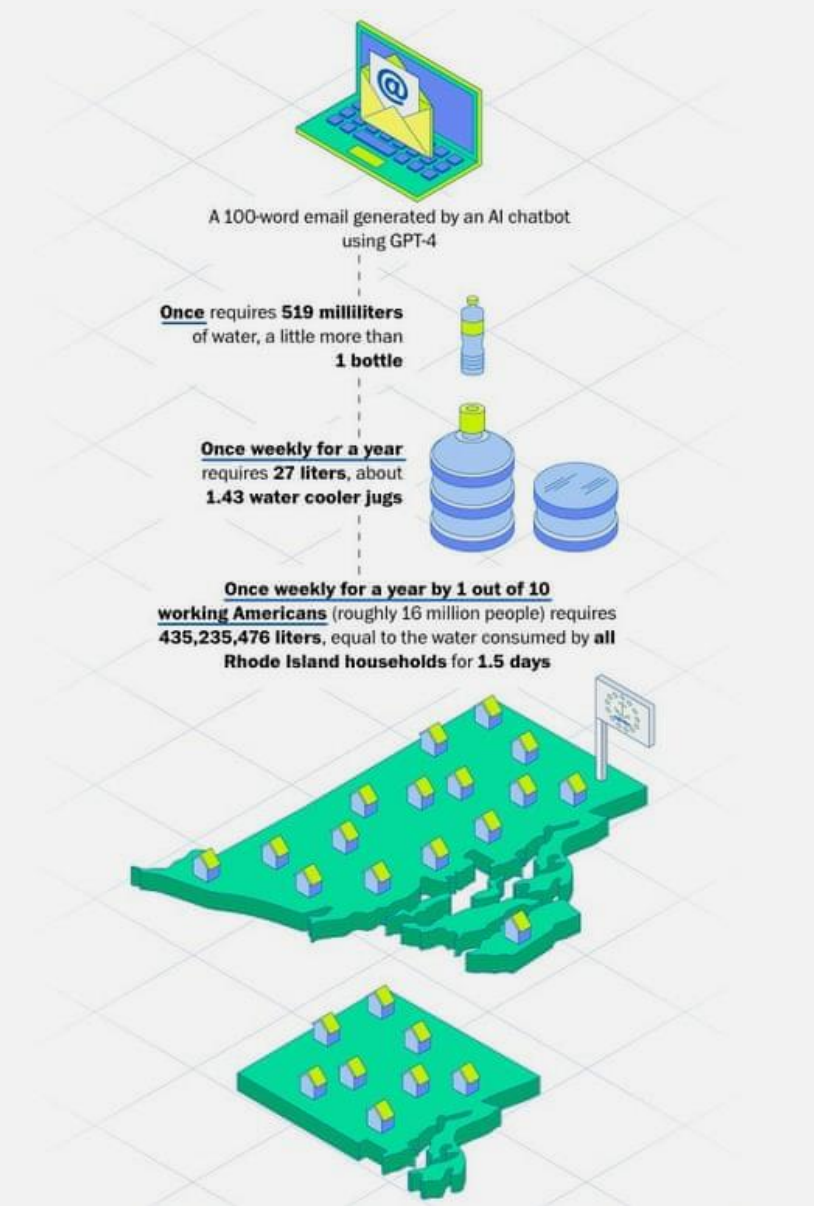
There is a negative side to the explosion of AI and its associated infrastructure, according to a growing body of research.

The proliferating data centers that house AI servers **produce electronic waste**.

They are **large consumers of water**, which is becoming scarce in many places.

They rely on critical minerals and rare elements, which are often **mined unsustainably**.

And they use **massive amounts of electricity**, spurring the emission of planet-warming greenhouse gases.



Source: [UNEP](#)

Source: [The Guardian \(Washington post\)](#)

Take-home messages

AI tools are **here to stay**, and many researchers are already using them.

AI tools **save us a lot of time**, but we must be careful when evaluating the responses they give us; critical thinking becomes key. Do not blindly trust the information—always double-check.

We must also be **mindful** of using these technologies, as they have a real impact on the environment.

