

Threats and Opportunities to deploying AI in the Research Ecosystem

Jürgen Wastl

2nd December 2024

Universitätsbibliothek Universität Wien



Objective of today's talk:

The Technologist's Dilemma

What is responsible AI

Our existing contributions to AI and transparency

Chatbots in Research; further examples of AI in use

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Before we start... Last week(s) in AI



npj | digital medicine

Published in partnership with Seoul National University Bundang Hospital

News & Views



<https://doi.org/10.1038/s41746-024-01345-9>

Artificial Intelligence awarded two Nobel Prizes for innovations that will shape the future of medicine

Ben Li & Stephen Gilbert

Check for updates

John J. Hopfield and Geoffrey E. Hinton were awarded the 2024 Nobel Prize in Physics for developing machine learning technology using artificial neural networks. In Chemistry it was awarded to Demis Hassabis and John M. Jumper for developing an AI algorithm that solved the 50-year protein structure prediction challenge. This highlights AI's impact on science, medicine and society; however, the winners acknowledge ethical aspects of AI that must be considered.

aggregation with other ML methods and architectures brought us to the ML technologies of today, including the overlapping concepts and implementations of deep learning, convolution neural networks, transformer and attention-based architectures (advanced neural networks that excel at, for example, natural language processing), large language models and large multimodal models¹. This is an evolving landscape of multipurpose foundation technologies, that some have compared to the printing press or the Internet in terms of reach and impact². As an example of this, and maybe as a portent of what is to come, the ML of the 2024 Nobel Prize in Physics even enabled the groundbreaking discovery associated with the 2024 Nobel Prize in Chemistry³.

2024 Nobel Prize in Chemistry

Hassabis and Jumper developed an AI model that accurately predicts pro-

<https://deepmind.google/public-policy/ai-for-science/>

[link](#)

TL;DR Shorts: Professor Lord Martin Rees on Artificial Intelligence

Artificial Intelligence (AI)

Community Engagement

Following yesterday's engaging and inspiring AI For Science Forum hosted by Google DeepMind and The Royal Society, this week's TL;DR Shorts episode features Professor Lord Martin Rees. A physicist, Astronomer Royal, former President of The Royal Society and author of many books that focus on the future, Martin shares his thoughts on the rise of AI in science and society.



<https://www.digital-science.com/tldr/article/tldr-shorts-professor-lord-martin-rees-on-artificial-intelligence/>

Research on Artificial Intelligence – the global divides

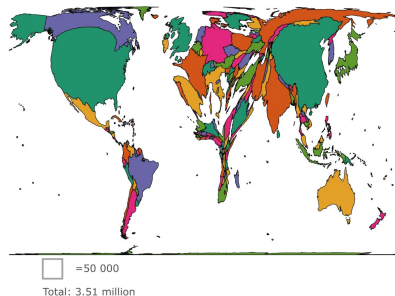
Artificial Intelligence (AI)

Global Challenges

Research Evaluation

There is a large global divide in AI research and development, with the vast majority of research publications and funding coming from the US, China, and EU27.

Geographic distribution



Deep Minds: Reflections from the AI for Science Forum

Artificial Intelligence (AI)

Community Engagement

Last week, Suze attended the AI for Science Forum, a gathering of incredible minds from across disciplines, each sharing perspectives on how AI is transforming research and impacting society. Organised by Google DeepMind and The Royal Society, the event brought together invited guests from across all segments of the research community to share their experiences and expertise, while also giving opportunities for attendees to meaningfully discuss how we can best wrangle this novel technology to increase the impact and reach of research with the resources currently at our disposal. Here's a reflection on the day's proceedings.

<https://www.digital-science.com/tldr/article/ai-for-science-forum/>

<https://www.digital-science.com/tldr/article/research-on-artificial-intelligence-the-global-divides/>



We believe
that research is the
single most powerful
transformational force
for the long-term
improvement of
society





**We help
research make
a positive
difference in
our world**





Brave in the pursuit of better

Collaborative and inclusive

Always open-minded

From and for the community





Brave in the pursuit of better

Collaborative and inclusive

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From and for the community

AI ?



The Technologist's Dilemma



The narrowing route to academic populism



We need to think broadly about “technology” - each of the following is a technology that changes a set of established societal norms.

- Impact Factor
- H-Index
- Rankings
- Alternative metrics
- Evaluation mechanisms
- Impact (e.g. UK REF, Australia E&I)

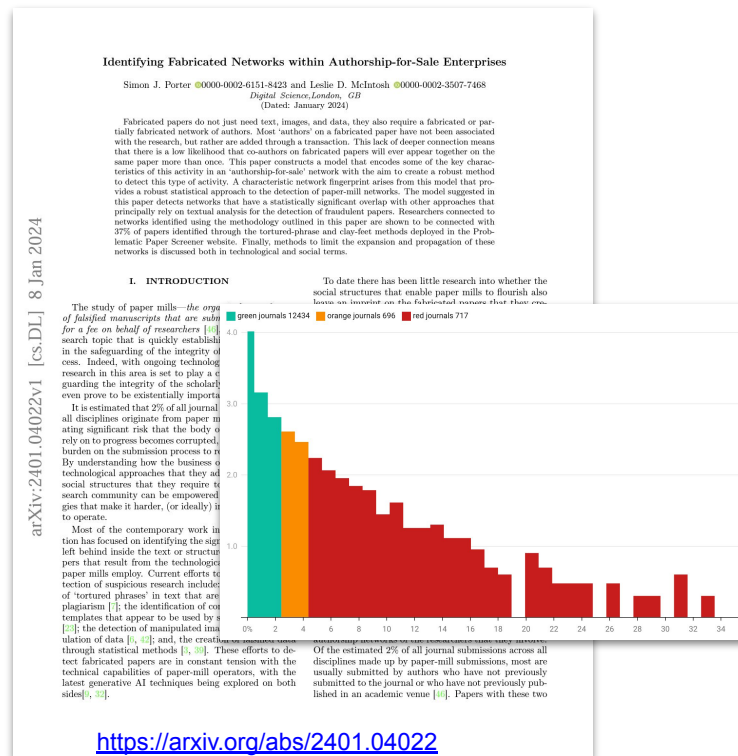
Measurement changes behaviour and these technologies have had a significant impact on our community

What establishes and what undermines trust?

- We are used to the technology underlying research moving slowly but we are entering a phase where there is much greater change and systems in flux are more at risk
- We have seen how other areas can be changed by technology:
 - News & Fake News
 - Social media and echo chambers
 - Alternative facts
- What are similar technology mechanisms in research?
 - Recommender algorithms?
 - Automated peer review?
 - Paper mills?

Paper mills and faking research

- Why engage with a paper mill?
 - Misaligned incentives: Pressure of needing produce for evaluation / career
 - Interest / Lobbying: Wanting to insert a particular perspective in the research literature
 - Delegitimising research



We use AI and data science to work on these

Key takeaways

- Forced citations unfairly inflate academic impact and harm research integrity.
- Citation-per-publication trends expose rapid, atypical impact growth.

Fong and Wilhite (2017) found that 14.1% of the 110,000 scholars they survey had been coerced into citing non relevant work. They also found that coercion occurred more often for:

- lower ranked academic
- fewer authors on the manuscript
- journals with high impact factor and published by private and profit-oriented companies

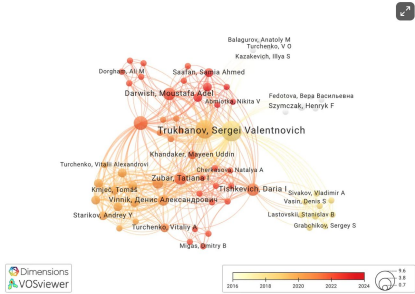
Yet, this behaviour is rarely highlighted publicly.. until last week when **pubpeer users spotted the following** in a peer reviewed publication:

As strongly requested by the reviewers, here we cite some references [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47]] although they are completely irrelevant to the present work.

This post investigates who might have requested these citations and how such cases could be identified in the future. For a complementary discussion, see **Leslie McIntosh's post on Forensic Scientometrics about vanity journals**, which explores how the current publishing model facilitates the existence of journals that enable such practices.

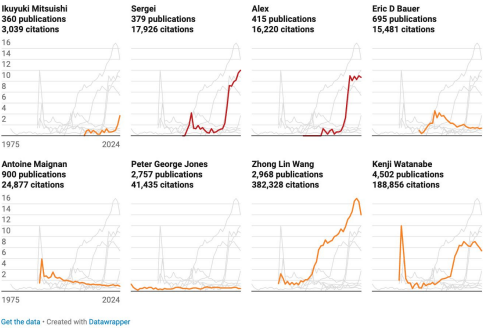
A Dimensions' network to start..

Some researcher sleuth had already suggested that Alex V Trukhanov was the obvious beneficiary of the citation dump by the time I became aware of the scandal. Nevertheless, I put the 12 citations listed in the PubPeer analysis into Dimensions, which revealed the co-authorship network below.



Trend in citations per publication-to-date

Number of citations received each year divided by the number of publications published until that year, in a random sample of researchers in the field of condensed matter physics and materials science, with a focus on magnetic materials, crystallography, and their applications in physics and engineering, and with a high number of publications.



Most loyal co-authors for Alex and Sergei Trukhanov

Researcher	Shared publications	Total publications	First publication	Earliest collaboration	Latest collaboration
Alex Trukhanov	438			2005	2024
Sergei Trukhanov	379			1999	2024
Daria I Tishkevich	112	129	2017	2017	2024
Tatiana I Zubov	88	99	2017	2019	2024
Данил Александрович Винник	74	217	2008	2017	2024
Abdullahi Baykal	68	639	1992	2018	2024
Yassine Abdelhamid Slimani	67	426	2013	2018	2024
Vitalii Alexandrovich Turchenko	62	125	2002	2015	2023
Munirah Abdullah Almesiereh	61	401	2015	2018	2024
Larissa V Panina	54	327	1990	2016	2024

Get the data - Created with Dataswapper

This investigation reveals how forced citation practices can artificially boost academic metrics, benefiting specific researchers at the expense of integrity. Citation-per-publication trends highlighted here these irregularities, emphasising the need for transparency and ethical practices in scholarly publishing.

<https://researchmusings.substack.com/p/a-case-of-forced-citations>

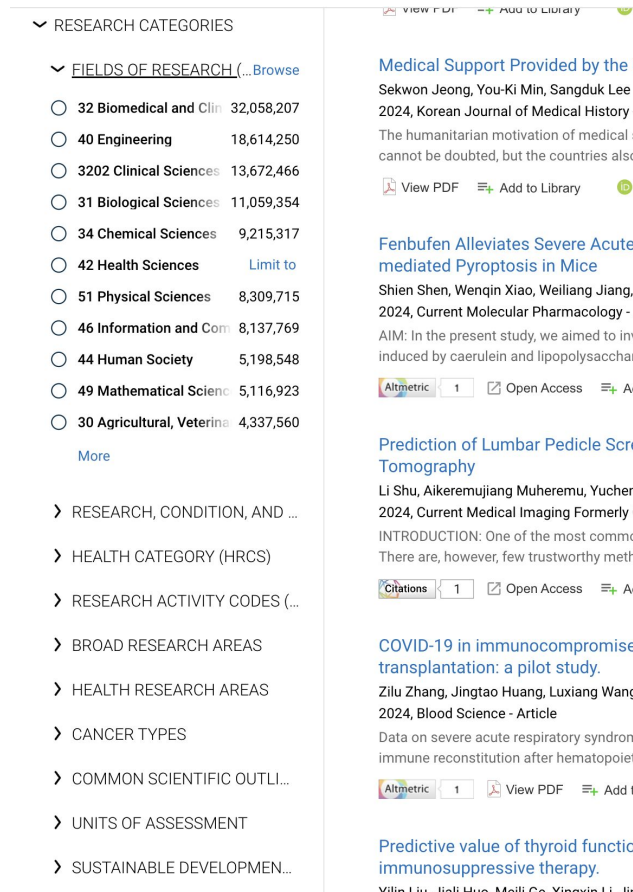
What is responsible AI?



We can start by asking, what is AI?

- Machine Learning
 - Categorisation & Clustering
 - Prediction & Recommendation
- Large Language Models
- “As data science is to statistics; AI is to data science”

It is a statistical science that is starting to power an exponential technology revolution that will change everything.



The screenshot displays a digital library interface. At the top right is the 'DIGITAL science' logo. Below it, a navigation bar includes links for 'view PDF', 'Add to Library', and a user profile icon. The main content area is titled 'RESEARCH CATEGORIES' and features a list of 'FIELDS OF RESEARCH' with corresponding article counts. The categories listed are: 32 Biomedical and Clinical (32,058,207), 40 Engineering (18,614,250), 3202 Clinical Sciences (13,672,466), 31 Biological Sciences (11,059,354), 34 Chemical Sciences (9,215,317), 42 Health Sciences (Limit to), 51 Physical Sciences (8,309,715), 46 Information and Communication (8,137,769), 44 Human Society (5,198,548), 49 Mathematical Sciences (5,116,923), and 30 Agricultural, Veterinary (4,337,560). A 'More' link is provided below the list. To the right of the categories, there are three article preview cards. The first card is titled 'Medical Support Provided by the' and lists authors 'Sekwon Jeong, You-Ki Min, Sangduk Lee' from '2024, Korean Journal of Medical History'. It includes a brief abstract about humanitarian motivation and links for 'View PDF', 'Add to Library', and 'Altmetric'. The second card is titled 'Fenbufen Alleviates Severe Acute mediated Pyroptosis in Mice' by 'Shien Shen, Wenqin Xiao, Weiliang Jiang' from '2024, Current Molecular Pharmacology'. It includes an abstract snippet and links for 'Altmetric', 'Open Access', and 'Add to Library'. The third card is titled 'Prediction of Lumbar Pedicle Scre Tomography' by 'Li Shu, Aikeremujiang Muheremu, Yuchen' from '2024, Current Medical Imaging Formerly'. It includes an introduction snippet and links for 'Citations', 'Open Access', and 'Add to Library'. The bottom of the screenshot shows a list of other research categories: 'RESEARCH, CONDITION, AND ...', 'HEALTH CATEGORY (HRCS)', 'RESEARCH ACTIVITY CODES (...)', 'BROAD RESEARCH AREAS', 'HEALTH RESEARCH AREAS', 'CANCER TYPES', 'COMMON SCIENTIFIC OUTLI...', 'UNITS OF ASSESSMENT', and 'SUSTAINABLE DEVELOPMEN...'. Each category has a corresponding icon and a brief description.

RESEARCH CATEGORIES

FIELDS OF RESEARCH (...Browse)

- 32 Biomedical and Clin 32,058,207
- 40 Engineering 18,614,250
- 3202 Clinical Sciences 13,672,466
- 31 Biological Sciences 11,059,354
- 34 Chemical Sciences 9,215,317
- 42 Health Sciences Limit to
- 51 Physical Sciences 8,309,715
- 46 Information and Com 8,137,769
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- 49 Mathematical Scienc 5,116,923
- 30 Agricultural, Veterin 4,337,560

More

RESEARCH, CONDITION, AND ...

HEALTH CATEGORY (HRCS)

RESEARCH ACTIVITY CODES (...)

BROAD RESEARCH AREAS

HEALTH RESEARCH AREAS

CANCER TYPES

COMMON SCIENTIFIC OUTLI...

UNITS OF ASSESSMENT

SUSTAINABLE DEVELOPMEN...

Medical Support Provided by the
Sekwon Jeong, You-Ki Min, Sangduk Lee
2024, Korean Journal of Medical History
The humanitarian motivation of medical
cannot be doubted, but the countries also

View PDF Add to Library Altmetric

Fenbufen Alleviates Severe Acute
mediated Pyroptosis in Mice
Shien Shen, Wenqin Xiao, Weiliang Jiang,
2024, Current Molecular Pharmacology -
AIM: In the present study, we aimed to im
induced by caerulein and lipopolysacchar

Altmetric 1 Open Access Add to Library

Prediction of Lumbar Pedicle Scre
Tomography
Li Shu, Aikeremujiang Muheremu, Yuchen
2024, Current Medical Imaging Formerly
INTRODUCTION: One of the most comm
There are, however, few trustworthy meth

Citations 1 Open Access Add to Library

COVID-19 in immunocompromise
transplantation: a pilot study.
Zilu Zhang, Jingtao Huang, Luxiang Wang
2024, Blood Science - Article
Data on severe acute respiratory syndrom
immune reconstitution after hematopoiet

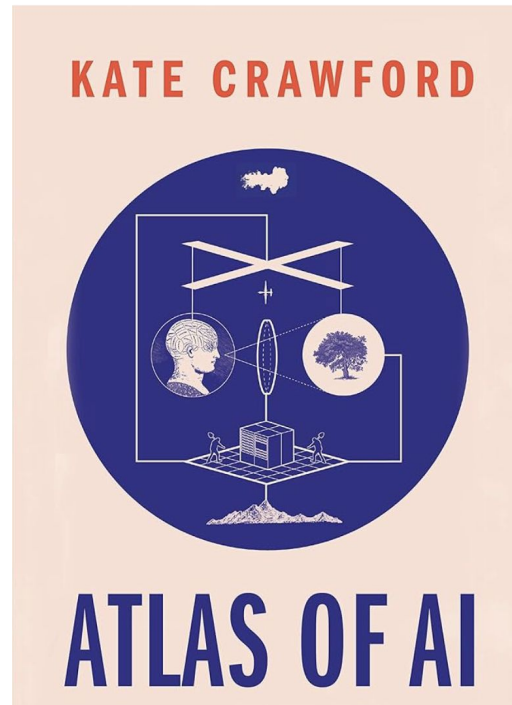
Altmetric 1 View PDF Add to Library

Predictive value of thyroid function
immunosuppressive therapy.
Yilin Liu, Jiali Huo, Meili Gu, Xingxin Li,

Taking responsibility in AI means many things

- Environmental Impact
 - Working on the architecture of AI
 - Work with and developing models that are scalable and appropriate
- Societal Impact
 - Considering the potential impacts of the technologies that you introduce and seeking to mitigate those impacts where they are negative

None of this is simple!



Some principles to consider

Think ahead

Engineer with feedback

Give people what they need, not what they want

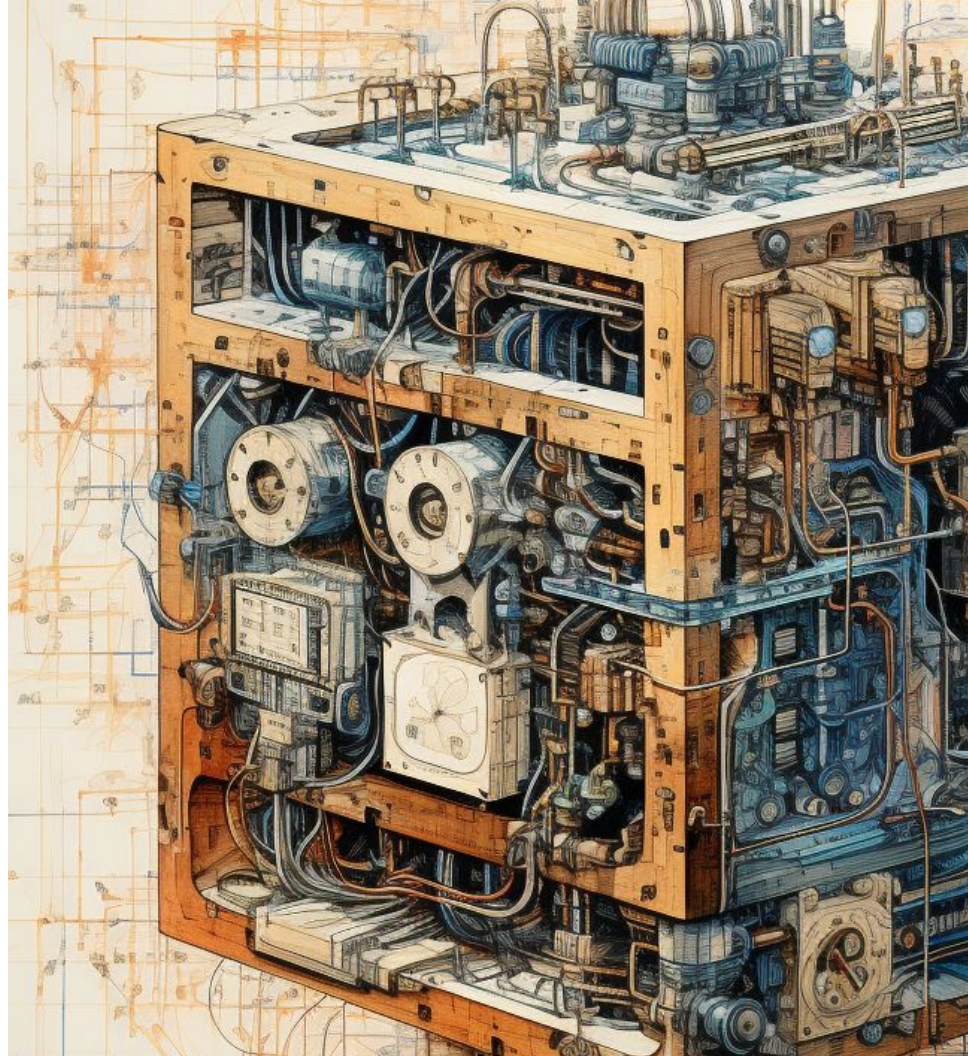
(i.e. there is responsibility to question and research what users need at a deep level)

Be transparent

Be sustainable

Be equitable

***Digital
Science's
existing AI
work
(Transparency!)***



Products & Experiments

Products

Dimensions

- Overall data approach
- Classification schemes: RCDC, SDGs, FoR Codes
- Research integrity data (Ripeta)

Readcube / Papers

Writefull

Experiments

AI Assistants

needs to be further investigated - 99% ACCEPT

need to be investigated more - 1% REJECT

Although the study has ~~no~~not shown any lasting ~~affects~~ effects, the method ~~need to be investigated more.~~ needs to be further investigated.

ACCEPT ALL

REJECT ALL

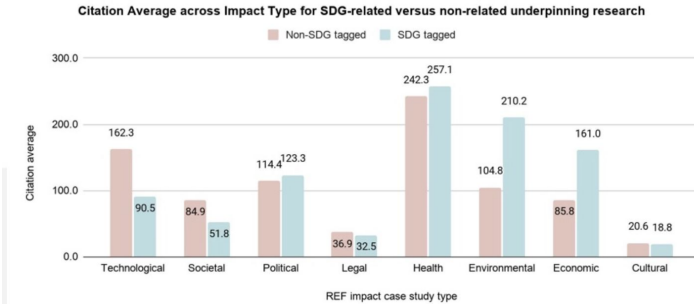
Contextualising Research & Analysis



Keyword search strings for each of the goals were defined in order to produce training sets based on publications from the *Dimensions* platform. Key phrases and terminology were based on UN definitions of SDGs, including the target and indicator definitions, and narratives.

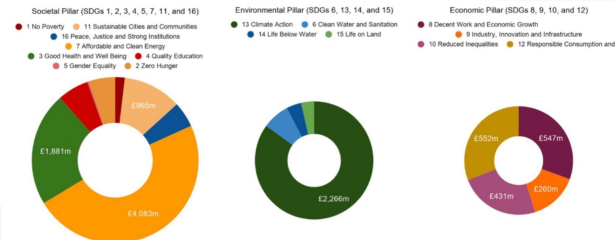
The aim was to create high-quality training sets with a minimum of false positives. To further improve the quality of the resulting training sets we repeatedly examined the results by checking the publications to ensure that they fitted the description of the SDG definition.

For each of the 17 created training sets, Natural Language Processing and Machine Learning was applied resulting in the classification scheme. A quality assurance (QA) process was also built in to improve the search string. Because of this, the resulting lists of publications for the training sets did not have to be adjusted manually by adding or removing individual publications.



<https://www.digital-science.com/blog/2021/03/sdgs-in-ref-impact-case-studies/>

How is funding allocated to support research in the context of SDG



<https://www.digital-science.com/blog/2021/05/ukri-sustainability-funding/>

Community & Transparency



<https://www.digital-science.com/tldr/article/the-lone-banana-problem-or-the-new-programming-speaking-ai/>



https://doi.org/10.1162/qss_a_00244

Dimensions Research GPT



What is it and how did we apply our principles?



- December 2022: Started development on AI Assistants in two separate teams without cross pollination
- April / May 2023: Initial community engagement
- August 2023: Took each of two separate approaches to market to test interactions and challenges
- Gathered feedback and considered the pitfalls
- 28th February 2024: Launched initial Dimensions Research GPT

What Dimensions Research GPT is and is not



- It is (obviously) a chat interface to the world of research.
- It is powered by ChatGPT and comes in two variants
- The first variant is Dimensions Research GPT, which is powered by an Open Access corpus indexed by Dimensions
- The second variant is Dimensions Research GPT Enterprise, which is powered by all the full text in Dimensions, plus grants, clinical trials and patents data

You

Speculate on the potential applications of PT symmetry to medical device development, providing references to appropriate supporting literature

Dimensions Research GPT

Talked to ai-api.dimensions.ai

The exploration of PT symmetry in medical device development reveals intriguing potential applications, particularly in the fields of ultrasonic medical devices and wireless power transfer (WPT) technologies. Based on an analysis of 26064 documents, several key studies offer insights into how PT symmetry principles are being applied to innovate in medical technologies.

1. **Ultrasonic Medical Devices:** PT symmetry principles have been applied in the development of high-performance piezocrystals, like Mn:PIN-PMN-PT piezocrystals, for use in ultrasonic scalpels for robotic minimally invasive surgery. These materials, with high electromechanical coupling efficiency, enable the miniaturization of ultrasonic devices, offering potential improvements in surgical tools by making them smaller, lighter, and more efficient (Fenu et al., 2020).
2. **Wireless Power Transfer (WPT) for Medical Implants:** The robustness of WPT systems, crucial for powering medical implants, can be significantly improved by adopting PT symmetry and asymmetry principles. These systems demonstrate enhanced efficiency and stability against varying operating conditions, such as fluctuations in transfer distance or orientation, which is critical for the reliable operation of implanted medical devices (Zhang et al., 2023).
3. **Material Advances for WPT:** Innovations in 2D materials for WPT, influenced by PT symmetry concepts, highlight the potential for advancements in wearable and implanted bioelectronics. These materials contribute to the development of novel antennas, transparent devices, and wireless brain-machine interfaces, offering future possibilities for more efficient and flexible medical devices (Gao et al., 2023).

In conclusion, PT symmetry is playing a pivotal role in advancing medical device development, from enhancing the performance of ultrasonic medical tools to enabling more efficient and reliable wireless power solutions for medical implants. These studies underscore the diverse applications of PT symmetry in healthcare technologies, contributing to a total of 26064 related findings.

To help answer your question or prompt, data related to Open Access publications has been retrieved from Dimensions to inform the generated statements. For information on the Enterprise version of the Dimensions Research GPT and for further exploration and discovery via the Dimensions web app, visit <https://www.dimensions.ai/products/artificial-intelligence/>



What Dimensions Research GPT is and is not



- It is not an analysis system or analytical tool - searching for your H-Index or to summarise your work will leave you disappointed in most cases.
- It is not a system for ranking - asking it for the top researchers in a field by citation, by proliferation is not what it is optimised for.
- It is a system based around language and hence it optimised for learning about a field in conversation.

You

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Dimensions Research GPT

By Dimensions 

The Dimensions Research GPT brings Dimensions' scientific evidence and ChatGPT's powerful generative AI capabilities together - get summaries and insights for research-related topics in seconds. Subject to terms at <https://www.dimensions.ai/dimensions-end-user-terms-for-gpts/>



Dimensions Research GPT Enterprise (Demo)

By Dimensions 

The Dimensions Research GPT brings Dimensions scientific evidence and ChatGPTs' powerful genAI capabilities together - get in seconds insights and summaries for complex research-related questions.



ChatGPT



Dimensions Research ... 



You
is glutamate bad for human health



Dimensions Research GPT

Talked to ai-api.dimensions.ai

In examining the impact of glutamate on human health, we retrieved data on 192,847 publications. The current discussion on glutamate's safety and health implications reveals varied perspectives and findings.

Monosodium Glutamate (MSG) and Health Risks: A significant focus has been on monosodium glutamate (MSG), a common food additive. Research by Kazmi et al. (2017) highlights potential adverse effects of MSG, including obesity, diabetes, and neurotoxicity in animal studies, with limited human research suggesting similar concerns (Kazmi et al., 2017). Al-Agili (2020) also reviews MSG's impact, pointing to risks like metabolic syndrome and liver or kidney issues, based on both animal models and human clinical studies (Al-Agili, 2020).

Umami Taste and Health Benefits: Contrasting these findings, some research explores the benefits of glutamate, particularly its role in the umami taste and potential health advantages. A book published in 2024 discusses how umami could help in reducing salt intake, enhancing satiation, and supporting healthy aging, indicating glutamate's positive effects on nutrition and health (Author unknown, 2024).

Biochemical and Physiological Perspectives: Further investigations delve into the biochemical pathways and physiological implications of glutamate. Studies explore its critical role in disease diagnosis, food safety, and embryonic development, indicating a nuanced understanding of glutamate's functions and impacts on human health (Van Winkle et al., 2020), (Rietjens et al., 2020), (Cai et al., 2023).

Other Health Concerns: Additional research connects glutamate with mental health disorders and neurological conditions, suggesting the need for further exploration into its multifaceted roles in human health (Terbeck et al., 2015), (Zhang, 2022).

In conclusion, the investigation into glutamate's effects on human health presents a complex picture with both potential risks and benefits, underscoring the necessity for more comprehensive human-based research to fully understand its impacts. The total of 192,847 results indicates a broad and diverse field of study surrounding glutamate and its implications for health.

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Demo ?
(later ?)



You
is glutamate bad for human health



ChatGPT

Glutamate, specifically in the form of monosodium glutamate (MSG), has been a subject of debate regarding its impact on human health. Glutamate is a naturally occurring amino acid found in many foods and is used by our bodies as a building block for proteins. It also serves as an important neurotransmitter in the brain. MSG is the sodium salt of glutamate and is commonly added to food as a flavor enhancer.

Most research indicates that MSG is safe for the majority of the population when consumed in reasonable amounts. The U.S. Food and Drug Administration (FDA) has classified MSG as "generally recognized as safe" (GRAS), a designation that applies to substances that are considered safe based on a long history of common use in food or on the results of scientific research.

However, some people may experience a condition known as MSG symptom complex, which can include symptoms like headache, sweating, facial pressure, numbness, tingling or burning in the face, neck and other areas, palpitations, nausea, and weakness. This condition, sometimes referred to as "Chinese Restaurant Syndrome," has been reported by some individuals following the consumption of foods containing MSG. Yet, scientific studies have not found a definitive link between MSG and these symptoms.

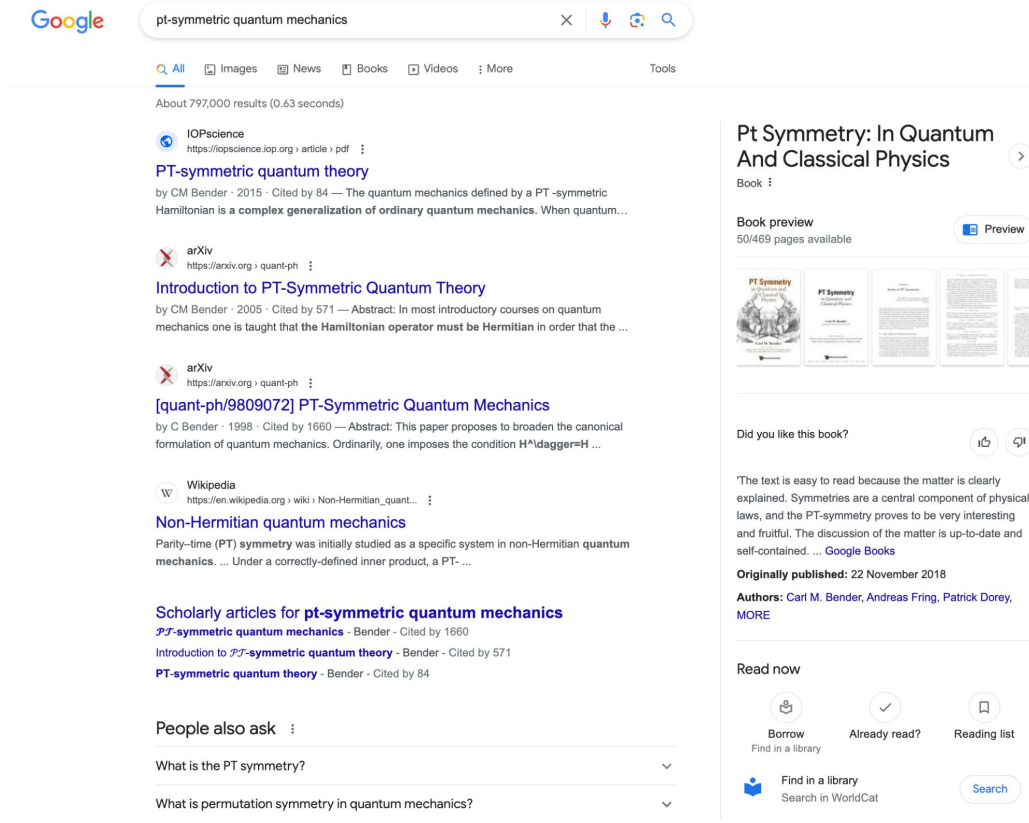
For the general population, glutamate and MSG are considered safe when consumed in typical amounts found in foods. It's worth noting that glutamate occurs naturally in many protein-rich foods such as meat, fish, dairy products, and vegetables. The key, as with many dietary components, is moderation.

Individuals who suspect they might be sensitive to MSG can monitor their reactions to foods containing it and consult with a healthcare professional for personalized advice. Given the widespread presence of naturally occurring glutamate in food, complete avoidance is difficult, but those with sensitivity may need to limit their intake of added MSG and be mindful of their overall consumption of glutamate-rich foods.

Challenges with AI Assistants

Undermining curiosity

- What users ask for: “The answer”; what people need: a route to explore the landscape
- What user are familiar with: Google; what people need: a route to improved relevance and targeted outcomes
- What users “should want” - a new style of interaction and discussion that improves how they locate, contextualise and understand information



The screenshot shows a Google search for "pt-symmetric quantum mechanics". The search bar at the top contains the query. Below the search bar, there are tabs for "All", "Images", "News", "Books", "Videos", and "More". The "All" tab is selected, showing "About 797,000 results (0.63 seconds)".

The search results include:

- IOPscience**: <https://iopscience.iop.org/article/pdf/PT-symmetric-quantum-theory>. PT-symmetric quantum theory by CM Bender · 2015 · Cited by 84 — The quantum mechanics defined by a PT -symmetric Hamiltonian is a complex generalization of ordinary quantum mechanics. When quantum...
- arXiv**: <https://arxiv.org/quant-ph>. Introduction to PT-Symmetric Quantum Theory by CM Bender · 2005 · Cited by 571 — Abstract: In most introductory courses on quantum mechanics one is taught that the Hamiltonian operator must be Hermitian in order that the ...
- arXiv**: <https://arxiv.org/quant-ph>. [quant-ph/9809072] PT-Symmetric Quantum Mechanics by C Bender · 1998 · Cited by 1660 — Abstract: This paper proposes to broaden the canonical formulation of quantum mechanics. Ordinarily, one imposes the condition $H^\dagger = H$...
- Wikipedia**: https://en.wikipedia.org/wiki/Non-Hermitian_quantum_mechanics. Non-Hermitian quantum mechanics Parity–time (PT) symmetry was initially studied as a specific system in non-Hermitian quantum mechanics. ... Under a correctly-defined inner product, a PT- ...

Below the search results, there is a section titled "Scholarly articles for pt-symmetric quantum mechanics" with links to [PT-symmetric quantum mechanics](#) (Bender - Cited by 1660) and [Introduction to PT-symmetric quantum theory](#) (Bender - Cited by 571).

At the bottom, there is a section titled "People also ask" with two questions:

- What is the PT symmetry?
- What is permutation symmetry in quantum mechanics?

On the right side of the search results, there is a book preview for "Pt Symmetry: In Quantum And Classical Physics" by Carl M. Bender, Andreas Fring, and Patrick Dorey. The book has 50/469 pages available. There is a "Preview" button and a "Read now" section with options to "Borrow", "Already read?", and "Reading list".

And more...

- Automate reviewer finding with Dimensions
- Code and categorise abstracts or other blocks of text with Dimensions
- Use generative AI to query a specific PDF with Papers AI
- Conduct sentiment analysis of social media conversations around specific research areas with Altmetric
- Improve academic writing with Writefull



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- 4th September 2024: Launched "chat with pdf" (Dimensions/readcube)

From research discovery to review with 'Chat with PDF'

Dimensions joined forces with Papers to bring you **'Chat with PDF'** - a more seamless experience for users wishing to take their next step in content discovery.

Available to all Dimensions users you can use 'Chat with PDF' to interact with any paper you have access rights to in the Papers AI Assistant.

Discover an uninterrupted workflow that takes you seamlessly from your research discovery in Dimensions to AI-powered research review in Papers, all in a couple of clicks.

Try it now on [Dimensions](#) and click on 'Chat with PDF' to enjoy a deeper and faster understanding of the literature .

The screenshot displays the 'Dimensions Chat with PDF' interface. At the top, the Dimensions logo is followed by the text 'A Digital Science Solution'. The main heading reads 'Dimensions Chat with PDF: An integration with Papers AI'. Below this, a sample research paper is shown with the title 'Design and implementation of a basic and global point of care ultrasound (POCUS) certification curriculum for emergency medicine faculty'. The paper is from the '2022 The Ultrasound Journal - Article'. The interface includes navigation links like 'View PDF', 'Add to Library', 'Chat with PDF', and 'Summarize'. On the right side, there are sections for 'RESEARCHERS', 'SOURCE TITLES', 'PUBLISHERS', and 'FUNDERS', each with a list of relevant items and counts.

In summary

1. This continues to be an area that we need to treat with care
2. Only with an open-minded, collaborative and brave approach will we find a solution that supports the research ecosystem
3. We need to be open to failing and changing course
4. We need to be able to stand back and ensure that we will not fall into the traps that we've seen in other areas.
5. This will continue to be an iterative journey.

Opportunities and risks - the Deepmind report

5 opportunities to accelerate science with AI



1. Knowledge

Transform how scientists digest and communicate knowledge



2. Data

Generate, extract, and annotate large scientific datasets



3. Experiments

Simulate, accelerate and inform complex experiments



4. Models

Model complex systems and how their components interact



5. Solutions

Identify novel solutions to problems with large search spaces

5 risks of using AI to accelerate science



1. Creativity



2. Reliability



3. Understanding



4. Equity



5. Environment

Some statements - for discussion?



Most scientific data is uncollected, partial, uncured or inaccessible, making it unavailable to train AI models.

Scientists' use of AI is growing exponentially, but policymakers have little evidence about who is doing it best, how they are doing it.

In a recent [Nature survey](#), scientists cited a reliance on pattern matching at the expense of deeper understanding as the biggest risk from using AI in science.



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