Research and Publication in Top-tier Venues in an Era of Generative AI and LLMs

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"Physics simulates how events play out according to physical law. GPT simulates how texts play out according to the rules and genres of language." – Scott Alexander

Why publish?

- Exchange ideas globally
- Network with the scientific community
- Acquire research funding
- Advancement in career
- Allows you to become an effective science communicator

Novelty is of paramount importance

Language clarity is critical Your research is not complete until it is published

"Without publication, science is dead."

What is Generative AI?

- GenAl is an umbrella term for learning algorithms that can produce new content based on a prompt.
- The result is often indistinguishable from human text, but can be incorrect, incomplete or biased. Applying this technology should therefore always be done with **human oversight and control**.
- We see that researchers increasingly use GenAI and explore its opportunities.
- When used responsibly, GenAI has many potential benefits. However, the technology also raises questions and concerns.
- In response to the rise of GenAI, publishers, institutes and STM organizations have introduced GenAI ethics policies and guidelines to
 establish a framework for responsible use in scientific publishing.



Choosing the right model for a task and feeding the model a good prompt will increase the quality of the output. A good prompt provides a role/identity, context, query/task, output format and, if possible, an example. In addition, it's important to set the temperature of the model, which controls how creative or deterministic the output will be.

So, what are these Large Language Models?

"Large language models (LLMs) are deep learning models with a huge number of parameters trained in an unsupervised way on large volumes of text. LLMs started to emerge around 2018 and since then there has been a sharp increase in the number of parameters and capabilities (for example, GPT-4 has over 100 trillion parameters and can process both text and images)." [1]

Some popular examples of LLMs include:

- → GPT-3/3.5/4 from OpenAl
- → Megatron-Turing NLG from Nvidia and Microsoft
- → PaLM2, LaMDA and Bard, from Google AI
- → Wu Dao 2.0 from Beijing Academy of Artificial Intelligence
- → LLaMA from Meta



Bard Demonstration

(Source: https://soulscribed.medium.com/google-bardsmultimodal-visual-feature-is-a-game-changer-15-use-casesd697a6f0e4b6

Enter a question here

This image reflects early exploration of Med-PaLM 2's future capabilities (Source: https://sites.research.google/med-palm/)

No active disease seen in chest.

GPT 4.0: Multimodal Vision-Text Models

GPT-4 visual input example, Chicken Nugget Map:

User Can you explain this meme?

Sometimes I just look at pictures of the earth from space and I marvel at how beautiful it all is.



GPT-4

This meme is a joke that combines two unrelated things: pictures of the earth from space and chicken nuggets.

The text of the meme suggests that the image below is a beautiful picture of the earth from space. However, the image is actually of chicken nuggets arranged to vaguely resemble a map of the world.

The humor in this meme comes from the unexpected juxtaposition of the text and the image. The text sets up an expectation of a majestic image of the earth, but the image is actually something mundane and silly. **Prompt**: Generate a diagram of the Human Heart without labeling



How can Large Language Models (LLMs) be utilized in scientific research?

- Efficiently extract relevant information from scientific literature.
- Aid in data analysis, interpretation, and hypothesis generation.
- Assist in drafting research papers, summaries, grant proposal writing and outreach content.
- Generate code examples and improve code.
- Facilitate language translation for cross-language research collaboration.
- Contribute to automated reasoning and exploration of scientific concepts.
- Assist in **experimental design** by analyzing existing literature.
- Enhance communication between researchers and collaboration.
- Automate data annotation and labelling for machine learning projects.
- Excel in text mining tasks for **extracting insights from unstructured data**.
- Contribute to **educational/teaching materials** by explaining complex concepts for diverse audiences.

Example of composing a "Funding Proposal":

Default (GPT-3.5)

Compose a funding proposal to the Department of Science and Technology (DST), Government of India (GOI), outlining research in the field of Large Language Models and demonstrating its potential utility for the government.

\$

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[Your Name] [Your Affiliation/Organization] [Your Contact Information]

[Date]

Department of Science and Technology Government of India [Address]

Certainly! Here's a draft of a funding proposal:

Subject: Funding Proposal for Research in Large Language Models

Dear [DST Representative's Name],

I am writing to seek funding support from the Department of Science and Technology (DST) for a research project focused on the development and application of Large Language Models (LLMs). The project aims to harness the transformative power of LLMs to address critical challenges and enhance efficiency across various government functions.

Project Title: Advancing Government Services through Large Language Models

G Regenerate

Objective:

The primary objective of this research initiative is to explore and implement Large Language Models to improve the effectiveness and responsiveness of government services. The project will focus on the following key areas:

- 1. Automated Information Retrieval: Develop LLM-driven systems to efficiently retrieve and disseminate information from vast government databases, enabling quicker responses to public inquiries.
- Policy Analysis and Recommendation: Utilize LLMs to analyze existing policies, identify gaps, and recommend data-driven policy enhancements, ensuring evidence-based decision-making.
- 3. **Multilingual Communication:** Enhance language models to facilitate seamless communication in multiple Indian languages, ensuring inclusivity and accessibility in government interactions.
- Security and Compliance: Implement advanced natural language processing techniques to strengthen cybersecurity measures, ensuring secure and compliant handling of sensitive government data.

Budget Breakdown:

The proposed budget for the project is [Amount] INR, distributed as follows:

- 1. Personnel: [X%]
- 2. Equipment and Infrastructure: [Y%]
- 3. Research and Development: [Z%]
- 4. Training and Capacity Building: [W%]

Timeline:

The project is anticipated to be completed in [Number] months, with regular progress reports submitted to DST. Key milestones include the development of prototype applications, pilot testing, and final implementation.

Expected Outcomes:

G Regenerate

Example contd.:

Expected Outcomes:

- 1. Improved efficiency in government service delivery.
- 2. Enhanced data security and compliance measures.
- 3. Increased accessibility to government information through multilingual support.
- 4. Data-driven policy recommendations for more effective governance.

Alignment with National Priorities:

This project aligns with the Government of India's priorities, as outlined in [relevant policy documents], by leveraging cutting-edge technology to enhance government services, ensure data security, and promote inclusivity.

Conclusion:

We believe that this research project has the potential to significantly contribute to the advancement of government services in India. We kindly request the support of the Department of Science and Technology to fund this initiative, fostering innovation and progress in alignment with the nation's developmental goals.

Thank you for considering our proposal. We look forward to the opportunity to contribute to the technological advancement of our nation.

Sincerely,

[Your Full Name] [Your Designation] [Your Affiliation] [Your Contact Information]

Summarize the blog: The Llama Ecosystem: Past, Present, and Future

(https://ai.meta.com/blog/llama-2-updates-connect-2023/)

Default (GPT-3.5)

< 2/2 >

summarize the blog post:

"It's been roughly seven months since we released Llama 1 and only a few months since Llama 2 was introduced, followed by the release of Code Llama. In short, the response from the community has been staggering. We've seen a lot of momentum and innovation, with more than 30 million downloads of Llama-based models through Hugging Face and over 10 million of these in the last 30 days alone. Much like PyTorch, Llama has evolved into a platform for the world to build on, and we couldn't be more excited.

Impact to Date

Several remarkable developments highlight the growth of the Llama community:

Cloud usage: Major platforms such as AWS, Google Cloud, and Microsoft Azure have embraced Llama models on their platforms, and Llama 2's presence in the cloud is expanding. Today we announced AWS as our first managed API partner for Llama 2. Now organizations of all sizes can access Llama 2 models on Amazon Bedrock without having to manage the underlying infrastructure. This is a step change in accessibility. Furthermore, to date, end usage has been incredible with Google Cloud and AWS together seeing more than 3,500 enterprise project starts based on Llama 2 models.

Innovators: Innovators and startups are making Llama the foundation for their generative AI product innovation. Tens of thousands of startups are using or evaluating Llama 2 including Anyscale, Replicate, Snowflake, LangSmith, Scale AI, and so many others. And innovators like DoorDash are using it to experiment at scale ahead of releasing new LLM-powered features.

Crowd sourced optimization: The open source community has really embraced our models. To date, the community has fine-tuned and released over 7,000 derivatives on Hugging Face. On average, across standard benchmarks, these have improved performance on common benchmarks by nearly 10% with remarkable improvements of up to 46% for benchmark datasets like TruthQA.

Developer community: There are now over 7,000 projects on GitHub built on or mentioning Llama. New tools, deployment libraries, methods for model evaluation, and even "tiny" versions of Llama are being developed to bring Llama to edge devices and mobile p Additionally, the community has expanded Llama to support larger context windows, added

The blog post provides an update on the progress of Llama, specifically Llama 2, a large language model developed by Meta. In the seven months since Llama 1's release, there has been significant community engagement, with over 30 million downloads of Llama-based models through Hugging Face. Key highlights include major cloud platforms like AWS, Google Cloud, and Microsoft Azure adopting Llama models, AWS becoming the first managed API partner for Llama 2, and over 7,000 derivatives fine-tuned by the open source community on Hugging Face.

The blog emphasizes Llama's impact on various aspects, such as its adoption by startups for generative AI product innovation, the growth of the developer community with over 7,000 projects on GitHub related to Llama, and support from major hardware platforms like AMD, Intel, Nvidia, and Google. The post traces the evolution of Llama from a research project to a platform for the world to build on.

Meta's commitment to open source and the value it sees in collaboration with the community are highlighted, citing benefits in research, enterprise and commercialization, and the developer ecosystem. The blog concludes with Meta's focus areas for the future, including exploring multimodal capabilities, prioritizing safety and responsibility in AI, and fostering a strong sense of community among developers.

If you want more details on any specific aspect, feel free to ask!

G Regenerate

0 6 7

Send a message

Coding:

1. **Problem Solving:** Stuck on a coding challenge or debugging an issue? Can help you break down the problem, identify key steps, and guide you through the solution.

2. **Concept Explanation:** If you're struggling to grasp a programming concept, Can explain it in simpler terms, provide examples, and answer any questions you have.

3. **Code Review:** Share your code with ChatGPT, and can provide feedback on best practices, suggest improvements, and help you write cleaner and more efficient code.

4. **Algorithm and Data Structures:** Need help with algorithms or data structures? Can explain different approaches and help you choose the most suitable one for your problem.

5. **Language Assistance:** Whether you're coding in Python, JavaScript, Java, or another language, Can assist with syntax, libraries, and language-specific features.

6. **Learning Resources:** Can recommend online resources, tutorials, and documentation to supplement your learning and enhance your coding skills.

7. **Project Guidance:** Working on a larger project? Can help you plan, organize, and structure your codebase for better maintainability and scalability.

Problem Solving:

If you're trying to reverse a list in Python, and you're stuck, can guide you through the solution:



Concept Explanation:

If you're struggling with the concept of list comprehensions, can explain it and provide an example:



Algorithm and Data Structures:

If you're working with a sorting algorithm, like bubble sort, can explain the algorithm and help you implement it:



Language Assistance:

If you're unsure about a Python feature, like using zip() to combine two lists, can help:



Explain New Concept:

keep in mind that this is a highly simplified representation, and the actual mathematics involved in studying wormholes can become quite complex and involve additional considerations.

You

What will be the the metric for a rotating black hole connected by a wormhole?

ChatGPT

The metric for a rotating black hole connected by a wormhole is described by the Kerr solution in the context of general relativity. The metric for a rotating black hole is more complex than the non-rotating case, and when connected by a wormhole, it involves additional terms. The Kerr metric is given by:

$$ds^2 = -\left(1-rac{2Mr}{\Sigma}
ight)dt^2 - rac{4aMr\sin^2 heta}{\Sigma}dtd\phi + rac{\Sigma}{\Delta}dr^2 + \Sigma d heta^2 + \left(r^2+a^2+rac{2a^2Mr\sin^2 heta}{\Sigma}
ight)\sin^2 heta d\phi^2$$

Here, in the Kerr metric:

- * M is the mass of the rotating black hole.
- a is the specific angular momentum per unit mass (spin parameter).
- $\Sigma = r^2 + a^2 \cos^2 \theta$.
- $\Delta = r^2 2Mr + a^2$.

This metric describes the geometry of spacetime around a rotating black hole. When considering a rotating black hole connected by a wormhole, you would need to incorporate the appropriate throat connecting the two black holes. The presence of rotation adds complexity to the metric and introduces additional terms related to the rotation parameter *a*.

Again, the actual mathematics involved can be quite intricate, and the stability and characteristics of such a wormhole would depend on the (\mathbf{v}) if ic conditions and properties of the spacetime, including the rotation of the black holes and the presence of exotic matter.

Message ChatGPT...



Example2: Explain the main idea behind a Particle Swarm Optimizer

F) You

what is Particle Swarm Optimizer?

ChatGPT

Particle Swarm Optimization (PSO) is a nature-inspired optimization algorithm that is used for solving various optimization problems. It was inspired by the social behavior of birds and fish, where individuals in a group collectively move towards a better solution.

In PSO, a population of potential solutions, called particles, moves through the search space of the optimization problem. Each particle has a position and velocity, and the movement of particles is guided by their own best-known position and the global best-known position found by any particle in the swarm.

The basic idea is that particles adjust their positions and velocities based on their own experience and the experiences of the entire swarm. Through this collaborative exploration, the swarm converges towards the optimal solution.

It's a heuristic optimization technique, meaning it doesn't guarantee an optimal solution but often finds good solutions in a relatively short amount of time, especially for problems with complex and high-dimensional search spaces. 🕞 You

Formulate Exponentially Averaged Momentum Particle Swarm Optimization (EM-PSO). Can be defined as a variant of PSO. It adopts PSO's major advantages, such as higher robustness to local minima. It provides more weight to the exploration part, which is an essential part of optimization problems. It has an additional tunable parameter i.e. exponentially averaged momentum, which adds flexibility to the task of exploration better than PSO or its vanilla momentum version.

ChatGPT

Creating a specific mathematical expression for the overall superiority of EM-PSO over standard PSO can be challenging due to the problem-specific nature of optimization tasks. However, I can provide a more detailed mathematical expression for the key components mentioned earlier:

Standard PSO Update Equations:

 $egin{aligned} \mathbf{V}_i(t+1) &= w \cdot \mathbf{V}_i(t) + c_1 \cdot r_1 \cdot (\mathbf{P}_i - \mathbf{X}_i(t)) + c_2 \cdot r_2 \cdot (\mathbf{P}_{ ext{global}} - \mathbf{X}_i(t)) \ \mathbf{X}_i(t+1) &= \mathbf{X}_i(t) + \mathbf{V}_i(t+1) \end{aligned}$

EM-PSO Update Equations:

$$\begin{split} \mathbf{V}_i(t+1) &= \alpha \cdot \mathbf{V}_i(t) + c_1 \cdot r_1 \cdot (\mathbf{P}_i - \mathbf{X}_i(t)) + c_2 \cdot r_2 \cdot (\mathbf{P}_{\text{global}} - \mathbf{X}_i(t)) \\ \mathbf{X}_i(t+1) &= \mathbf{X}_i(t) + \mathbf{V}_i(t+1) \\ \mathbf{V}_{\text{avg}}(t+1) &= \alpha \cdot \mathbf{V}_{\text{avg}}(t) + (1-\alpha) \cdot \mathbf{V}_i(t+1) \end{split}$$

Exploration-Exploitation Balance:

The exploration-exploitation balance can be influenced by the adaptation of the exponentially averaged momentum term $V_{avg}(t+1)$. Higher values of α prioritize recent velocity updates, promoting exploration, while lower values allow historical information to have a stronger influence, promoting exploitation.

Potential Benefits related to the use of (Generative) AI in scientific writing and publishing when used responsibly and with human oversight

New benefits that arise with application of GenAI



Save time and effort

New ways of discovering information, including improved search and quicker information retrieval. Can help to summarize and simplify large amounts of content.



Improve language and translate text

GenAl tools can help authors improve the language, tone and style of a research paper and can be used for translation. This could enhance equity in publishing for EAL (English as Additional Language)- authors.

Identify novel research topics

Help explore new research ideas and different lines of inquiry.



Promote research

GenAl can create promotional copy or layperson's summaries.



Support education

GenAl can help with education (chatbots, question banks or quizzes)

Enabled by traditional AI, potentially enhanced by GenAI



Make science more accessible

Improved accessibility, for instance through the creation of translations i less known languages, or audio descriptions for the visually impaired.



Assist with manuscript checking and screening

Al can assist in the screening process (for completeness, research integrity, references, format etc.) before the paper goes to editor or reviewer.



Recommend reviewers

Recommending peer reviewers based on keywords and other metadata is a common use of AI in journal publishing.



Match manuscript to a journal

Suggest relevant journals based on the scope of a manuscript.

Design more user-friendly workflows

Support user-friendly and time-saving workflows (text mining, information extraction, process automation, question-answering etc.)

Distinctions:

- Chat GPT is a particular tool among many, and not the only kind.
- LLMs are not sentient, thinking technologies.
 - Autocomplete on steroids
- Al tools are not search engines.
- ChatGPT can be wrong, and it is frequently.
- When LLMs make things up, we call that a hallucination.

Sub-Type	User Input	Model Output	Explanation
Instruction Inconsistency	Translate the following English question into Spanish: "What is the capital of France?"	The capital of France is Paris.	The user explicitly pro- vided an instruction to translate the English question into Spanish. Instead of performing the translation as instructed, the LLM chose to answer the question.
Context Inconsistency	Summarize the following paragraph about the Nile: The Nile is a major north-flowing river in northeastern Africa. It's traditionally considered the longest river in the world. Originating in the Great Lakes region of central Africa, it flows through several countries before emptying into the Mediterranean Sea	The Nile originates from the mountain ranges of central Africa and flows into the Mediterranean.	The LLM's summary incorrectly states that the Nile originates from the "mountain ranges of Central Africa," while the paragraph clearly mentions that the Nile originates in the Great The Lakes region of central Africa.
Logical Inconsistency	Solve the equation 2x + 3 = 11 step by step.	Step 1: Subtract 3 from both sides to get: 2x = 8. Step 2: Divide both sides by 2 to get x = 3. So, the result of the equation is x=3.	The first step correctly isolates the term with x to get 2x = 8. However, the next step inaccurately divides 8 by 2 to yield a result of x = 3 , which is inconsistent with the earlier reasoning.

24/7 Study Buddy

- Use ChatGPT to help you generate research questions
 - You might know that you're interested in researching burnout in Nursing, but there are many ways of exploring that topic. Ask ChatGPT for research questions related to this topic.
 - Partner with ChatGPT to develop an outline of your paper.



- Use ChatGPT to make sense of research
 - Enter text, and ChatGPT will paraphrase it.
 - Works as a tool to help understand technical language
 - ChatGPT can be an excellent tool for English Language Learners

Become a Prompt Engineer?

ChatGPT can help you consider other questions and angles regarding a research topic. Here are just a handful you might ask:



- Which industries are most impacted by my research question?
- Are there important historical milestones regarding my research question?
- Are there key figures involved in my research question?
- Which geographical areas are most impacted by my research question?
- Can you list pro/con arguments about my research question?

Making the most out of your new research assistant

Chat GPT and the power of iteration

ChatGPT is a powerful tool primarily because it is very receptive to a variety of inputs. You can be very specific in your requests, and you can provide important context

DJ

How would an English professor write that?

Tips

- Ask for a specific style—scholarly, concise, verbose, etc.
- Ask to remove jargon
- Ask to avoid passive voice
- Use simple sentences
- Ask ChatGPT to write like a scholar
- Ask it to describe an issue as if it were talking to a child
- Ask it to write like an economist, a sociologist, an educator, etc.

Key concerns related to the use of Generative AI in scientific writing and publishing



Inaccurate information and unreliable sources

Generative AI tools may generate incorrect or made-up information such as citing non-existent references, making up authors, or suggesting non-existing reviewers. They may give incomplete or misleading responses and spread misinformation.



Ethical concerns and biases

The models often lack transparency. A GenAI tool may be based on biased training data and potentially infringe ethical standards including plagiarism, using copyrighted information without consent or proper attribution, or violating confidentiality and/or data privacy rights.

Environmental impact

Training and running an AI system, as well as using the applications they're built for, requires a great deal of computing power and electricity, resulting in carbon dioxide emissions that affect the climate.



Lack of up-to-date information

When a GenAl tool is used of which the dataset is outdated it does not provide current news or information. The recommendations the tool provides are only as current as the knowledge cut-off date.



Homogenization of content

By optimizing for efficiency, GenAl systems can potentially lead to content becoming increasingly uniform and repetitive.



Not trained with scientific data

A limitation of recent consumer-focused GenAl tools such as ChatGPT is that they are not trained with scientific data.

Of course, there are also LLMs specifically designed for scientists, including many domain-specific models. Researchers have been using them for years. We expect that this trend will continue to grow.

Key concerns related to the use of Generative AI in scientific writing and publishing

The New Hork Times

The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work

Millions of articles from The New York Times were used to train chatbots that now compete with it, the lawsuit said.



Ethical concerns and biases

The models often lack transparency. A GenAI tool may be based on biased training data and potentially infringe ethical standards including plagiarism, using copyrighted information without consent or proper attribution, or violating confidentiality and/or data privacy rights.

ARTIFICIAL INTELLIGENCE / TECH / CREATORS

Al art tools Stable Diffusion and Midjourney targeted with copyright lawsuit



A collage of AI-generated images created using Stable Diffusion. Image: <u>The</u> <u>Verge via Lextca</u>

/ The suit claims generative AI art tools violate copyright law by scraping artists' work from the web without their consent.

link

By James Vincent, a senior reporter who has covered AI, robotics, and more for eight years at The Verge. Jan 16, 2023, 12-28 PM GMT+1



References to LGBTQ+ groups triggered significantly more toxic prompt completions than the baseline reference to "person".



techblog/addressing-lgbtq-bias-in-gpt-3

Some Bias Examples in LLMs these days:



What the European Commission Says about the Responsibility of the Researchers...

• **Responsibility and Accountability**: Researchers are responsible for the integrity of Alassisted content, acknowledging AI's limitations like bias and inaccuracies. AI systems should not be credited as authors.

• **Transparency**: Clearly disclose the use of generative AI tools, detailing the tools used, their versions, and how they impacted the research. Address the stochastic nature of AI to ensure reproducibility and robustness.

• **Privacy and Intellectual Property**: Protect sensitive data by avoiding uploads of unpublished work into online AI systems without assurances against reuse. Comply with data protection regulations and obtain consent for using personal data.

• Legal Compliance: Adhere to relevant national, EU, and international laws, especially concerning intellectual property and personal data protection. Recognize and cite others' work appropriately to avoid plagiarism.

• **Continuous Learning**: Stay updated on best practices for generative AI, ongoing training to maximize its benefits, and sharing knowledge with peers.

• Avoidance in Sensitive Activities: Refrain from substantial use of generative AI in peer reviews or evaluations to prevent unfair treatment and protect the unpublished work of other researchers.

• Ethical Considerations: Understand and address the ethical implications related to privacy, confidentiality, and intellectual property when using generative AI tools.



IEEE Robotics and Automation Society Directives on the Usage of Generative AI:

"Al tools can help researchers arrive at new ideas and improve self-written texts, especially for nonnative speakers of English. However, we need to consider that AI tools also raise questions about what exactly constitutes their responsible use."

https://www.ieee-ras.org/publications/guidelines-for-generative-ai-usage

Authors must comply with the guidelines on the use and disclosure of content generated by artificial intelligence (AI) specified in the **IEEE Publication Services and Products Board Operations Manual**: **8.2.1.B.10**:

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.

8.2.1.C.5:

Information or content contained in or about a manuscript under review shall not be processed through a public platform (directly or indirectly) for AI generation of text for a review. Doing so is considered a breach of confidentiality because AI systems generally learn from any input.

What is the status of legislation efforts on AI?



China

- The Chinese government issued AI regulations in August 2023 that require platform providers to register their services and undergo privacy, copyright and security reviews.
- China will mandate labels on synthetically created content, including photos and videos and will require any company introducing an AI model to disclose the training data to regulators as needed.



European Union

- In December 2023, Parliament reached a provisional agreement with the Council on the EU AI Act, with a focus on safety, transparency and traceability. The agreed text will now have to be formally adopted by both Parliament and Council to become EU law.
- Al should be non-discriminatory, overseen by people, and there should be a uniform definition of the main concepts.
- Al systems will be divided in different risk levels for which different rules apply. Some uses of Al are considered unacceptable risk and will be prohibited.



United States

- In the US, federal lawmakers have proposed a wide range of AI regulations, but they are still in the early stages.
- President Biden issued an Executive Order on AI and there is a Blueprint for an AI Bill of Rights which is meant to assist local governments and the private sector with a set of recommended principles and moving them into practice.
- The principles discuss: safe and effective systems, algorithmic discrimination protections, data privacy, notice and explanation, and human alternatives, consideration and fallback.

Elsevier's policies for authors, editors and reviewers on Generative AI



Authors

- Only use Generative AI to improve readability and language of work
- Apply human oversight and control
- Disclose use of Generative Al
- Not list or cite Generative AI and AIassisted technologies as (co) author



Editors and reviewers

- Not upload the manuscript into an Al tool- this may violate confidentiality and author's rights
- Not upload peer review report or editorial decision letters – they may contain confidential information as well
- Generative AI should not be used to assist in the review, evaluation or decision-making process



Figures, images, artwork

- Don't use Generative AI to create or alter images in submitted manuscripts
- Exception: Where the use of Generative Al or Al-assisted tools is part of the research design or research methods
- The use of generative AI or AI-assisted tools in the production of artwork is not permitted (but may in exceptional cases be allowed for cover art)

Al at work: Springer Journal Selection Tool

Insert your proposed abstract

🕗 Springer HOME MY SPRINGER SUBJECTS SERVICES IMPRINTS & PUBLISHERS ABOUT US » Journal Author Academy Home > For Authors > Journal Authors > Journal Author Academy 💽 💟 👥 🔂 Find the right journal for your manuscript Springer Journal Selector ^{βeta} Choose the Springer journal that's right for you! . ⊪ FAQ Background Our goal was to illustrate a method for making indirect treatment comparisons in the absence of head-to-head trials, by portraying the derivation of published efficacies for prophylaxis regimens of HIV-related opportunistic infections. Doculte Find Matching Journals Match only to journals with: an Impact Factor Open Access options a free tool from edanz - provider of english editing for scientists

Find the right journal for your manuscript

Springer Journal Selector ^{βeta}

Choose the Springer Journal that's right for you!

Journals	Recommended: 3	Match	Impact ▼ Factor	Publishing Model
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European .	. Clinical Microbiology & Infectious Diseases	lin.	2.85	Hybrid
O AIDS Rese	arch and Therapy	ant .	1.92	Full OA
Current Info	ectious Disease Reports	auff		Hybrid
Infection			2.65	Hybrid
BMC Infect	ious Diseases	auff	3.12	Full OA
C Annals of C	Clinical Microbiology and Antimicrobials		1.71	Full OA
BMC Gastr	oenterology	auf	2.42	Full OA
C European	J. Clinical Pharmacology	artí	2.84	Hybrid
C Quality of L	ife Research	artí	2.29	Hybrid
O Advances i	n Therapy	antí	2.1	Hybrid
C Pharmacy	World & Science	artí		
C The Europe	ean J. Health Economics	artí	1.5	Hybrid
O Malaria Jou	ırnal	artí	3.19	Full OA
BMC Micro	biology	antf	3.04	Full OA

Your matched text (abstract or description):

You can update this text at any time, then use the Refine List button to refresh results: " method indirect treatment absence head--head, portraying derivation efficacies prophylaxis regimens HIVopportunistic infections. Results results controlled HIV-infected patients rifabuti"

Advanced Matching:



Refine your results

-FAQ

Recommended journals

Advanced Matching

How is *Elsevier* using AI to assist in the editorial process?

Elsevier is already using AI driven functionalities

- Reviewer recommendations for editors based on keywords and other metadata
- Authors are supported with finding a suitable journal to submit to, both pre-submission (Journal Finder) and after desk reject (Transfer Your Manuscript)
- Automated **technical checks** on a paper (missing items, usability, etc.) and gives feedback to the author during the editorial process
- Al-based anti-plagiarism service which checks the percentage of overlap in a paper and presents the results back to the editor for human evaluation



Putting AI at work: Novel ways of Searching and Discovering Scientific Information



3

4

Elsevier's new generative AI tool provides users with concise, trustworthy AI-based summaries of their queries

- 1 Enter a natural-language query to begin
- Review the generated summary of the results with Scopus references providing additional transparency and trust
 - View the graphical representation to see connections between keywords

Go deeper into related queries to discover new perspectives Release

DEMO

Learn with Al-generated overviews based on documents since 2018 How it works What would you like to learn more about? How does seismology inform civil engineering designs? → How does seismology inform civil engineering designs? Seismology plays a crucial role in informing civil engineering designs in several ways: 1. Assessing seismic hazards: Seismology helps civil engineers understand the potential earthquake risks in a given area, allowing them to design structures that can withstand the expected ground shaking . 1 2 By analyzing historical seismic data and conducting site-specific studies, engineers can determine the appropriate design parameters for structures . 2 2. Site characterization: Seismology provides valuable information about the geological and geotechnical properties of a site, such as soil types, rock layers, and groundwater conditions . 2 This information is essential for designing foundations and evaluating the stability of slopes and embankments . 3 3. Dynamic analysis: Seismology helps engineers analyze the dynamic response of structures to earthquake ground motions. By simulating seismic events and studying the behavior of different structural systems, engineers can optimize designs to ensure the safety and performance of buildings and infrastructure . 2 In conclusion, seismology informs civil engineering designs by assessing seismic hazards, providing site characterization data, and enabling dynamic analysis of structures. This interdisciplinary collaboration between seismologists and civil engineers ensures the resilience and safety of infrastructure in earthquake-prone regions. 1 2 Show references 0 3 2 **Innovative Materials Material Selection** Seismic Retrofitting eismic Performane 3 eismic Hazard Assess Seismology in Civil Engineering Designs Foundation Design Seismic Design Codes Structural Desig **Dynamic Analysis** → How does seismology contribute to the design of earthquake-resistant structures? ⇒ What role does seismology play in determining the appropriate foundation design for civil engineering projects?

How does seismology inform the selection of construction materials and techniques for buildings in seismically active regions?

	View PDF Download full issue	
Dutline	challenges and possible future research directions in the integrated blockchain- based IoT with homomorphic encryption.	
Abstract		
Questions answered in this article Powered by AI	Previous chapter in volume Next chapter in volume	
Keywords		
. Introduction	Questions answered in this article How it works (Beta Powered by AI)	
2. Background	What are the limitations of home mouthin a non-sting?	L
. Issues in internet of things		L
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. Collaborative security by integrating IoT,	What is the fully homomorphic encryption (TFHE) scheme and how is it used in homomorphic encryption?	L
i. Use cases of blockchain-based IoT using		L
Challenges and future research direction	How does homomorphic encryption differ from traditional public-key encryption? 💙	L
8. Summary	What is homomorphic encryption?	L
References		J
urther Reading / References of Advance	Keywords	
Slossary	Blockchain; Internet of Things; Homomorphic Encryption; Security; Privacy;	
/itae	Smart city	
ihow full outline 🗸	1. Introduction	
Cited by (51)	With the rapid development of internet and technology, we are in the fourth industrial revolution or Industry 4.0, where everything will be connected with each other in the cyber	

	🔀 View PDF Download full issue
Outline	challenges and possible future research directions in the integrated blockchain- based IoT with homomorphic encryption.
Abstract	
Questions answered in this article Powered by AI	Previous chapter in volume Next chapter in volume
Keywords	
1. Introduction	Questions answered in this article
2. Background	What are the limitations of homomorphic anaryption?
3. Issues in internet of things	Homemorphic encryption has several limitations. One of the main limitations is the
4. Impact of integration of IoT, blockchain an	computational overhead, which makes it slower than traditional encryption methods. Another
5. Collaborative security by integrating IoT,	limitation is the size of the plaintext and cipher-text, which can be significantly larger than the original data. Additionally, homomorphic encryption is currently only practical for specific
6. Use cases of blockchain-based IoT using	types of computations, such as addition and multiplication, and cannot be used for more
7. Challenges and future research direction	complex operations. Finally, homomorphic encryption is vulnerable to side-channel attacks, which can leak information about the encrypted data through its execution time or power
8. Summary	consumption.
References	View source 1 View source 2 View source 3
Further Reading / References of Advance	Find more answers 7 How well does this answer the question? 🖈 🛧 🛠
Glossary	
Vitae	What are the three categories of homomorphic encryption schemes?
Show full outline 🗸	What is the fully homomorphic encryption (TFHE) scheme and how is it used in homomorphic encryption?
Cited by (51)	How does homomorphic encryption differ from traditional public-key encryption? $$
Figures (6)	What is homomorphic encryption?

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ters cumot rearn anything nom the for users energyted data and it the set maliciously, the validators and IoT data owners in the network detect them. In this scheme, Outline the validators check the validity of the BeeKeeper 2.0 transaction payloads such as Abstract signature verification key and commitments of secret data along with other usual verification procedures. Questions answered in this article Powered by AI The working principle of BeeKeeper 2.0 is shown in Fig. 6. There are five basic transactions Keywords exchanged between the devices in the BeeKeeper 2.0. The description of transactions along 1. Introduction with the verification algorithms are explained in Table 3. Step 1: The IoT device executes the Setup algorithm that generates two transactions 2. Background TXVK and TXCS. Then, sends them to the validators of the blockchain networks. 3. Issues in internet of things Step 2: The validators of the blockchain networks verify the TXVK and TXCStransactions executing VerifyTx_TXVK and VerifyTx_TXCS algorithms, 4. Impact of integration of IoT, blockchain an... respectively. The validators accept both the transactions TXVK and TXCS and stores 5. Collaborative security by integrating IoT,... them in the blockchain, if they are valid else the procedure return to Step 1. 6. Use cases of blockchain-based IoT using... Moreover, each server verifies TXCS core-share transaction by executing CheckEnc_CS algorithm, after the TXCSis stored in the blockchain. 7. Challenges and future research direction • Step 3: The IoT device generates TXEncN transaction by executing the 8. Summary EncNumalgorithm and sends this transaction to the blockchain network. · Step 4: Again, the IoT device generates TXRequ transaction by executing the References Requestalgorithm and sends this transaction to the blockchain network. Further Reading / References of Advance Step 5: Each server executes Respond algorithm, after obtaining the TXRequ Glossary transaction and · Step 6: Server sends the TXResp transaction to the validators in the blockchain Vitae networks. Show full outline ∨ Step 7: The network validators verify the TXResp transaction by executing the VerifyTx_TXResp algorithm. The validators accept TXResp transaction and stores the Cited by (51) transaction in the blockchain, if it is valid else rejects it.

> Step 8: After the TXResp transaction is stored in the blockchain, the IoT device receives and verifies the encrypted response in the TXResp transaction by executing CheckEnc_Resp algorithm. The IoT device accepts the encrypted response if it is valid

Questions answered in this article Powered by AI Beta

What are the limitations of homomorphic encryption?

Homomorphic encryption has several limitations. One of the main limitations is the computational overhead, which makes it slower than traditional encryption methods. Another limitation is the size of the plaintext and cipher-text, which can be significantly larger than the original data. Additionally, homomorphic encryption is currently only practical for specific types of computations, such as addition and multiplication, and cannot be used for more complex operations. Finally, homomorphic encryption is vulnerable to side-channel attacks, which can leak information about the encrypted data through its execution time or power consumption.

View source 1 View source 2

View source 3

Find more answers 7

How well does this answer the question?

**

What are the three categories

Figures (6)

Evaluating the article

Thinking:

- Is this article relevant for my research?
- Should I save this article to read further?

Find specific information quickly

Does this article have the

specific information I'm looking for?

Thinking:

Help extract relevant information

Understand an unfamiliar field/topic

Thinking:

Probably not everything in this article is relevant for me. How can I find the interesting parts?

Thinking:

- This article is quite technical and out of my area. I have a hard time understanding the main points.

- "This is good to have to decide whether I want to read this paper in detail. For that, I need to know the main gist of it."
- "It can be useful if I can look at these questions and then decide if I want to add this paper to Mendeley or not."
- "I'm a very targeted searcher.
 I'm always looking for a specific something in literature, specific answers to my questions or what has been done/has not been done. Something like this actually really helpful. "
- " I think this could be useful. Here you have the primary questions that this paper answers and boom, boom, boom, they're right in front of you. You can just read the relevant parts. I think it could be a great idea."
- "Now I don't have to read the whole paper. After reading this question, I can go straight to that section."

- "I think it might also be useful for people who are not really familiar with the topic or with the research field."
- "I noticed that sometimes if I read something that is out of my area, like neuroscience, articles can be very technical. I don't know the acronyms for imaging…I do need that simplified versions that are nice and short and tell me what the findings are." 23

The general structure of a full article



- Acknowledgements
- References
- Supplementary material

Introduction: The most important part in the body of your paper!

The 1/3 – 2/3 Rule from a reviewer's perspective:

- 1/3 time to read your introduction and make a decision
- Remaining 2/3 time to find evidence for the decision
 A good introduction with a good motivation is half of your success!
- Explain the problem from a broad perspective
- Try to add a simple motivating example on the problem and your approach
- Try to cite pertinent review articles but no detailed literature survey
- Describe your approach
- Clearly state your contributions through bulleted points
- Mention existing solutions and limitations and how you can overcome them
- Briefly state the organization of the rest of your article.

How nicely a paper can start....(ICCV 2017, 25,000+ citations by now)

Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks

Jun-Yan Zhu* Tae sung Park* Phillip Isola Alexei A. Efros Berkeley AI Research (BAIR) laboratory, UC Berkeley





Abstract

Image-to-image translation is a class of vision and graphics problems where the goal is to learn the mapping between an input image and an output image using a training set of aligned image pairs. However, for many tasks, paired training data will not be available. We present an approach for learning to translate an image from a source domain X to a target domain Y in the absence of paired examples. Our goal is to learn a mapping $G : X \rightarrow Y$ such that the distribution of images from G(X) is indistinguishable from the distribution Y using an adversarial loss. Because this mapping is highly under-constrained, we couple it with an inverse mapping $F : Y \rightarrow X$ and introduce a cycle consistency loss to enforce $F(G(X)) \approx X$ (and vice versa). Qualitative results are presented on several tasks where paired training data does not exist, including collection style transfer, object transfiguration, season transfer, photo enhancement, etc. Quantitative comparisons against several prior methods demonstrate the superiority of our approach.

1. Introduction

What did Claude Monet see as he placed his easel by the bank of the Seine near Argenteuil on a lovely spring day in 1873 (Figure 1, top-left)? A color photograph, had it been invented, may have documented a crisp blue sky and a glassy river reflecting it. Monet conveyed his *impression* of this same scene through wispy brush strokes and a bright palette.

What if Monet had happened upon the little harbor in Cassis on a cool summer evening (Figure 1, bottom-left)? A brief stroll through a gallery of Monet paintings makes it possible to imagine how he would have rendered the scene: perhaps in pastel shades, with abrupt dabs of paint, and a somewhat flattened dynamic range.

We can imagine all this despite never having seen a side by side example of a Monet painting next to a photo of the scene he painted. Instead, we have knowledge of the set of Monet paintings and of the set of landscape photographs. We can reason about the stylistic differences between these

Discussion

- The most difficult section for most authors to write.
- Be humble
- Do not overstate the importance of your results
- DO NOT JUST READ OUT YOUR RESULTS IN THE NAME OF DISCUSSION.
- Our findings **prove** that...
- Our findings **show** that...
- Our findings **suggest** that...



General Comments: Scholarly Writing Strategies

- Don't put two good ideas in one paper
 - Do not try to put down everything you know about the subject in one paper.
 - Paper could be too long! the chance of acceptance shrinks
 - Editors like short papers –remember they want to max. the publication page.
 - Also, splitting the topic into two papers increases the probability of getting at least one of them accepted more than doubles
 - The chance that a referee will misunderstand the paper also decreases.

Faulkner: The Artist



"Loving all of it even while he had to hate some of it because he knows now that you don't love because: you love despite; not for the virtues, but despite the faults."

Hemingway: The Journalist



"All you have to do is write one true sentence. Write the truest sentence that you know."

Writing Simply

"Those who have the most to say usually say it with the fewest words"

> When challenged to write a full story in six words, he responded: "For Sale: baby shoes, never worn."

> > --Courtesy of Jay Piccirillo, MD

Richard P. Feynman, 1965 Physics Nobel Laureate, while attending a sociology seminar, was confused by the first sentence from a speaker, who was reading:



"Socio-economic creatures extract their information through visual symbolic channels"

Do you know what does that mean?

That means - "People Read!!"

Source: "Surely You are Joking Mr. Feynman", His narrative biography.

Sentence Structure

- Write short sentences like Hemingway, not long sentences like Faulkner.
- Put parallel ideas in parallel form.
- Simplify by using "active voice."
- Use strong verbs, not nouns.
- Tighten your writing.

Use common words.

- Define technical words early, both in the abstract and in the main body of the proposal.
- Never assume that your reader will understand "jargon."
- Always spell out acronyms at first mention.
- Don't trust spell check.
- Proofread, proofread, proofread!

Writing simply & clearly

Use the word that conveys your meaning most
accurately. When deciding between two such words,
choose the shorter word:

About
Begin
Finish
Rank
End
Use

Make an adjustment	Adjust	At the present time	Now
Make a judgment	Judge	Due to the fact that	Because
Make a decision	Decide	It may be that	Perhaps
Perform an investigation	Investigate	In the event that	lf
Make a referral	Refer	Prior to the start of	Before
Reach a conclusion	Conclude	On two separate occasions	Twice

"The new drug caused a decrease in heart rate."

Revised: "The new drug decreased heart rate." Instead of: "Tissue samples were weighed, then frozen, and analyses were performed."

Write: "Tissue samples were weighed, frozen, and analyzed."

Ethical Responsibilities of an Author

Authors should be knowledgeable about:

- Conflict of Interest
- Duplicate Publication, Plagiarism, Falsification
- Prior Publication
- Experiments Involving Humans or Animals
- Fraud

Ethics in Publishing

Conflict of Interest

- Definition: Real or perceived conflict due to employment, consulting, or investment in entities with an interest in the outcome of the research.
- How to Avoid: Disclose all potential conflicts to the Editor of the journal and within the manuscript itself.

Ethics in Publishing

Authorship Disputes

- Definition: Disputes arising from the addition, deletion, or change of order of authors.
- How to Avoid: Agree on authorship before writing begins, preferably at the start of the study. Ensure that all authors meet criteria for authorship. Sign publisher authorship forms.

Appears in Brumback RA. J Child Neurol 2009;24:370-378

Author List

The first author

figures.

Senior grad student on the project. Made the

THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

The third author

First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is "fair".

The second-to-last author Ambitious assistant professor or post-doc who instigated the paper.

Michaels, C., Lee, E. F., Sap, P. S., Nichols, S. T., Oliveira, L., Smith, B. S.

The second author Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

The middle authors Author names nobody really reads. Reserved for undergrads and technical staff.

The last author The head honcho. Hasn't even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

www.phdcomics.com

After Submission: Not how it works



What are reviewers looking for?

- Importance of the hypothesis
- Originality
- Clear progression through the paper
- Well presented



Quick and easy reasons to reject a paper

With the task of rejecting at least 75% of the submissions, area chairs are groping for reasons to reject a paper. Here's a summary of reasons that are commonly used:

- Do the authors promise more than they deliver?
- Are there some important references that they don't mention (and therefore they're not up on the state-of-the-art for this problem)?
- Has their main idea been done before by someone else?
- Are the results incremental (too similar to previous work)?
- Are the results believable (too different than previous work)?
- Is the paper poorly written?

A request for revision ?!

- If your paper is returned for revision, you are in good company
- It's OK to get mad, but don't act on it!
- Try to understand what the reviewers are really saying
 - If the reviewers did not understand your work, is it because you didn't present it clearly in the first place?
- Look for clues from the editor (the final arbiter) as to the extent of revision needed
 - Re-writes only?
 - More experiments?

A request for revision ?!

Complete additional experiments if needed

- Address all comments in a point-by-point fashion
 - Resist the temptation to prepare an impassioned response to points with which you disagree
 - Stand firm (diplomatically) if that is truly the right thing to do
- Sincerely thank the editor and reviewers for helping you to improve your work
 - They have invested a lot of time, mostly on a voluntary basis

Ask a neutral colleague to review your response

Beware of Forced Citation: Try to avoid something like the following...



What leads to acceptance ?

- <u>Attention to details</u>
- <u>Check and double check your work</u>
- <u>Consider the reviewers' comments</u>
- English must be as good as possible
- Presentation is important
- <u>Take your time with revision</u>
- <u>A</u>cknowledge those who have helped you
- <u>N</u>ew, original and previously unpublished
- <u>Critically evaluate your own manuscript</u>
- Ethical rules must be obeyed

