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AI Literacy for Researchers

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What is AI?

What is AI?

Artificial Intelligence, or **AI** is a term coined in the 1950s to refer to machines that would be able to simulate human intelligence and problem-solving. These days, it is being used to describe any advanced machine learning system.

Machine learning is a branch computer science that focuses on building systems that learn, i.e. gradually improve performance, based on the data they consume. It is referred to as **deep learning**, when the systems in question are based on multilayered neural networks.

Generative AI, or **GenAI** refers to deep learning models that can generate text, code, images and other media in response to user input (prompts), simulating the data they were trained on.



Everything is called AI now!



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GenAI models

- Text generation
- Image generation
- Video generation
- Sound generation

Non-generative machine learning models (rebranded as AI)

- Object recognition for assisted driving
- Medical image analysis
- Stock price prediction
- Weather forecasting
- Recommendation systems

“Traditional” (non-generative) AI is good at analysing data, extracting hidden insights and trends from it and making predictions. GenAI isn’t!

Read more:

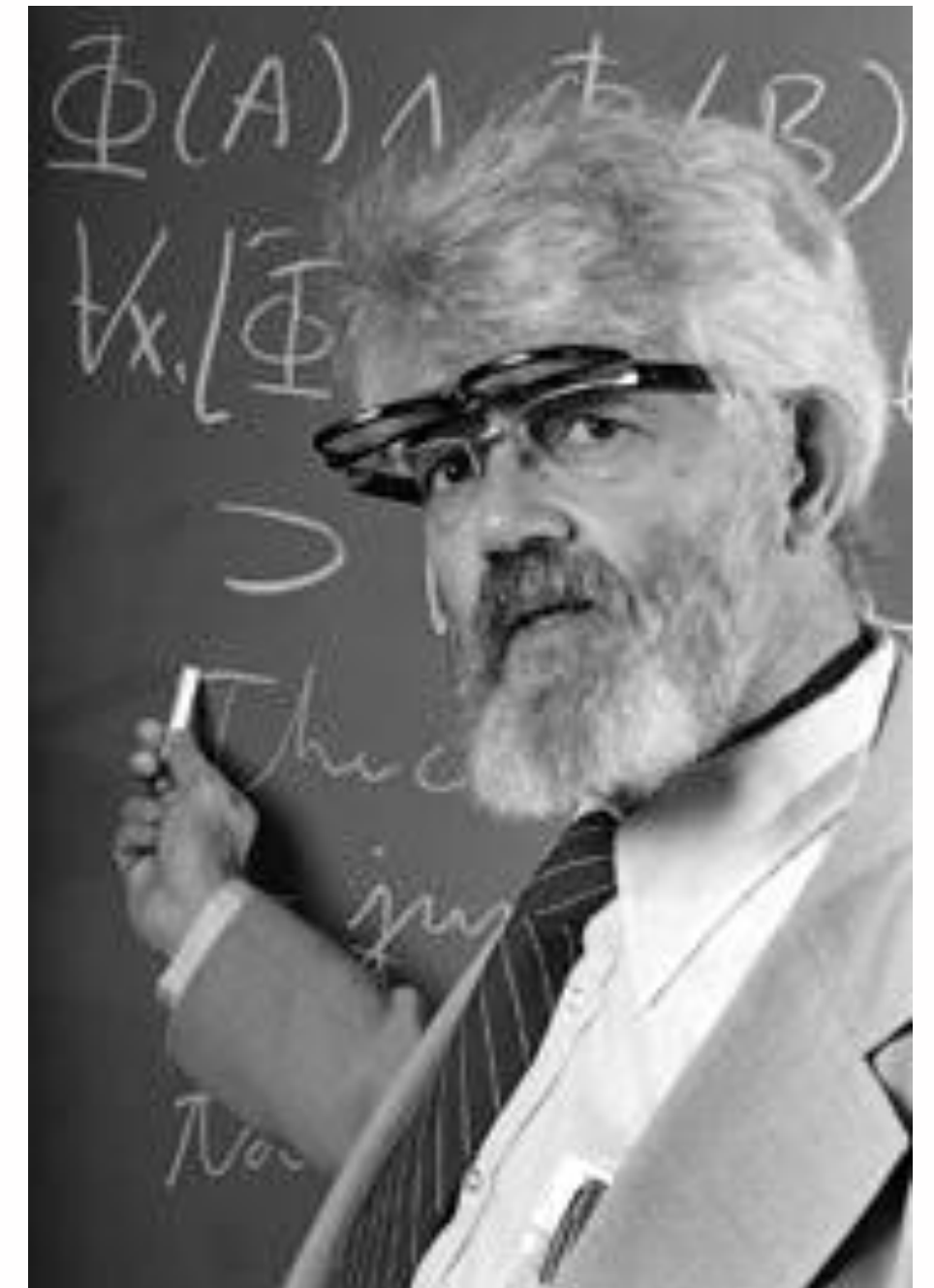
- <https://cloud.google.com/docs/ai-ml/generative-ai/generative-ai-or-traditional-ai>
- <https://dataforest.ai/blog/generative-and-non-generative-ai-the-strengths-of-both-approaches>

AI is a Marketing Term



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- ...one wants to make some sort of analogy. One wants to bring in what one can gain by a study of how the brains of living creatures operate. This is the only possible reason for calling it artificial intelligence.
- Excuse me. I invented the term artificial intelligence. I invented it because... when we were trying to get money for a summer study.



James Lighthill & John McCarthy, [The Lighthill Debate](#) (1973)

Image source: [Nature](#)

AI is Normal Technology



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To view AI as normal is not to understate its impact <...> But it is in contrast to both utopian and dystopian visions of the future of AI which have a common tendency to treat it akin to a separate species, a highly autonomous, potentially superintelligent entity.

We view AI as a tool that we can and should remain in control of.



Arvind Narayanan & Sayash Kapoor, [AI as Normal Technology](#) (2025)

Image source: [TIME](#)

What is GenAI?



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Generative: generates content



Artificial: created by humans



Intelligence

Large Language Model*

**can also refer to image, video and audio generation models*

LLMs “learn” by statistically analysing the distributions of words, pixels or other elements in the training data and identifying common patterns. They can model and simulate data, but lack human-like reasoning abilities and information verification mechanisms.



Image source: [iStock](#)

LLMs are Stochastic Parrots

Contrary to how it may seem when we observe its output, an LM is a system for haphazardly stitching together sequences of linguistic forms it has observed in its vast training data, according to probabilistic information about how they combine, but without any reference to meaning: a stochastic parrot.

Emily M. Bender et al., [On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?](#) (2021)



Image source: [Intelligencer](#)



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How does it work?

Language Models

The model is simply trained to predict the next word

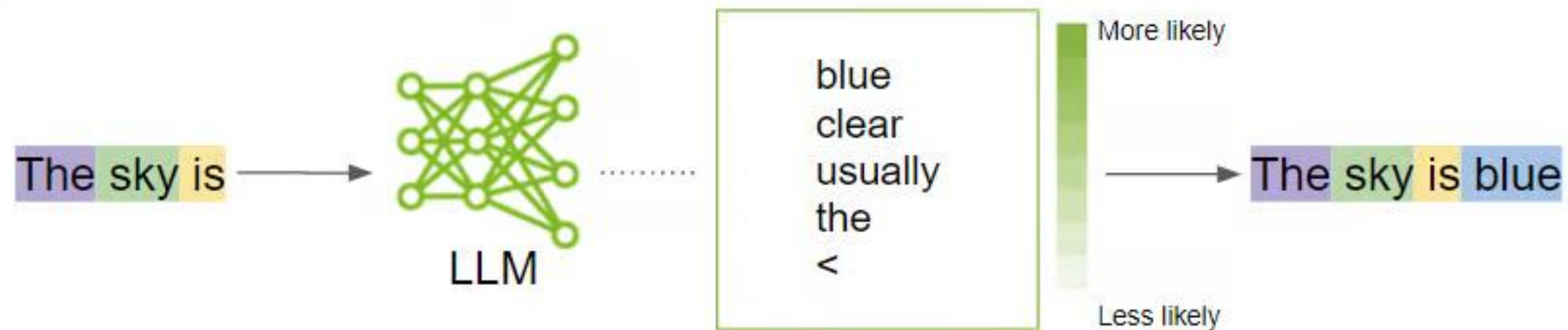
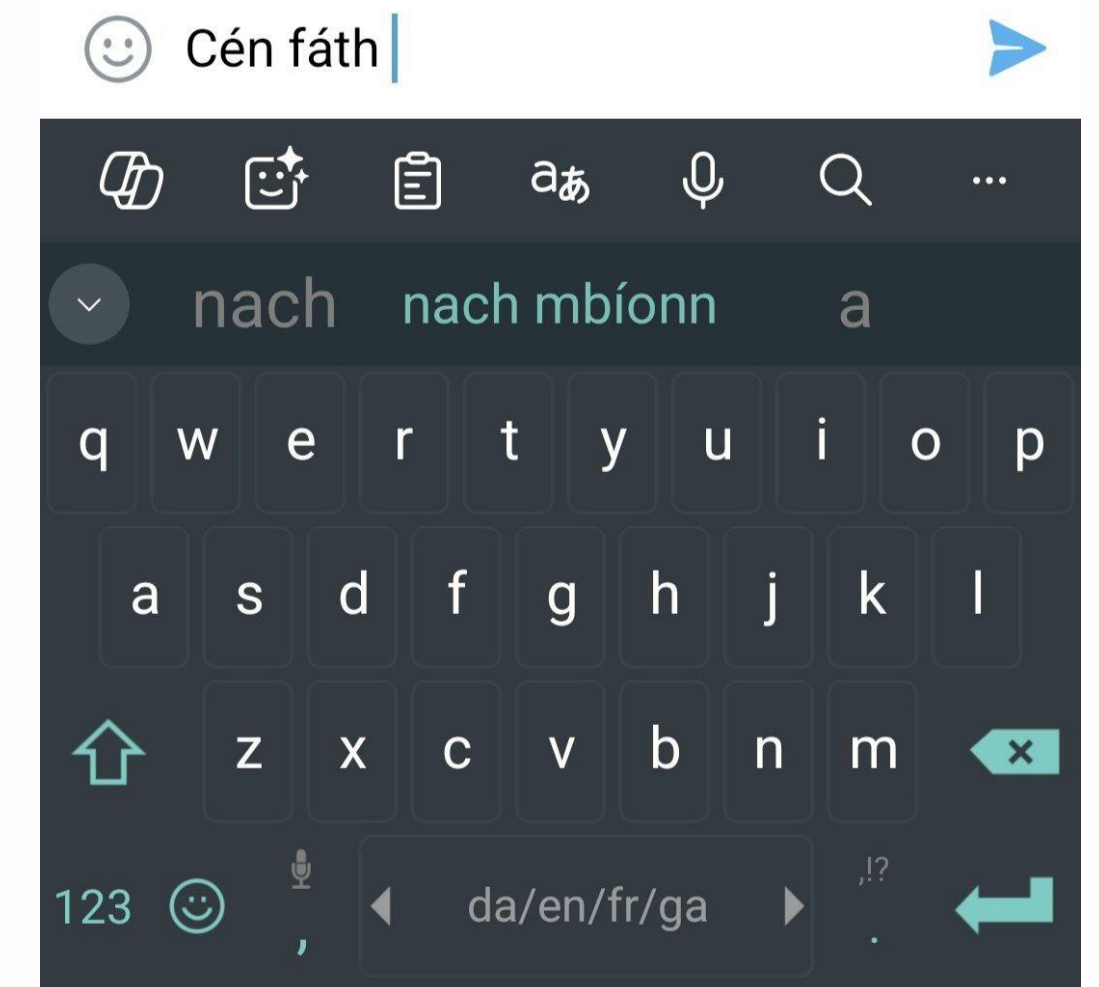
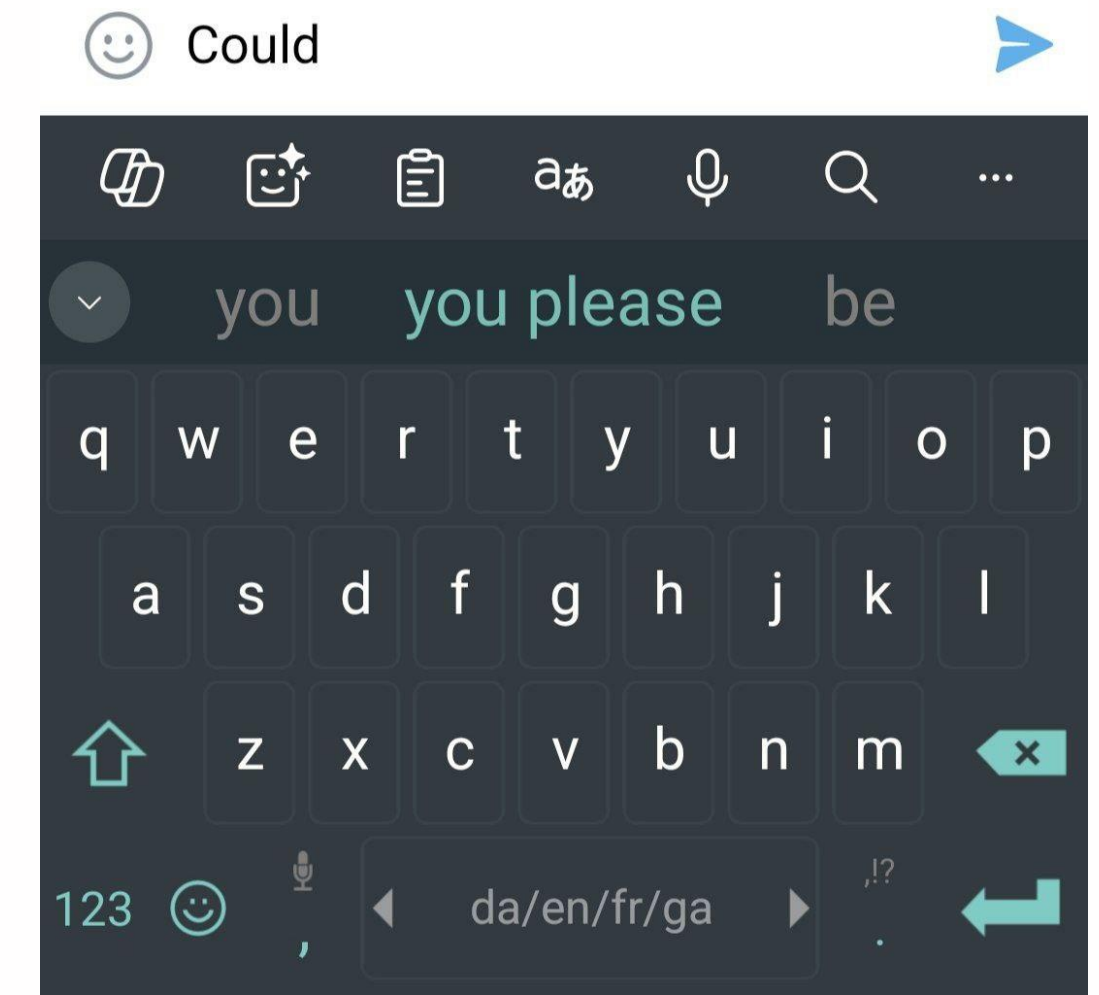


Image sources: [Manning](#), [Nvidia](#)



Large Language Models



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- Trained on vast amounts of data
- Often multilingual
- Often multimodal (= can process not only text, but other types of input, e.g. images)

<https://github.com/Hannibal046/Awesome-LLM>



 Claude



(M)LLMs are good at text-centric templated tasks



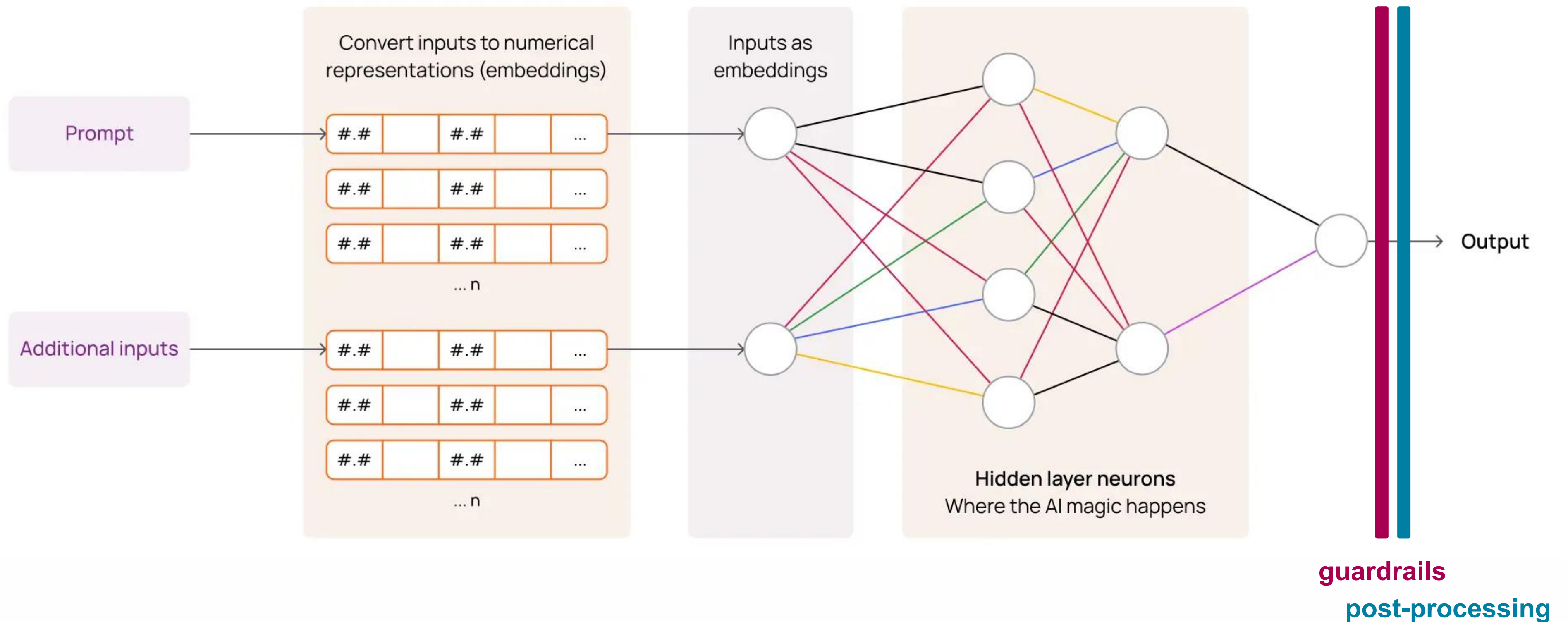
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- Spelling and grammar correction
- Suggesting synonyms
- Rewording or reformulating text (for example, to simplify it)
- Providing a general overview of a topic *(but not too niche!)*
- Rewriting text in a particular style
- Generating new text based on a template
- Applying formatting, e.g. LaTeX, to text
- Autocomplete (for both text and code)
- Labelling textual data
- Translation
- Information extraction from text
- Speech recognition
- Image captioning
- ? Summarisation *(not always, because LLMs rather shorten than summarise texts)*

Generating Response from Prompt



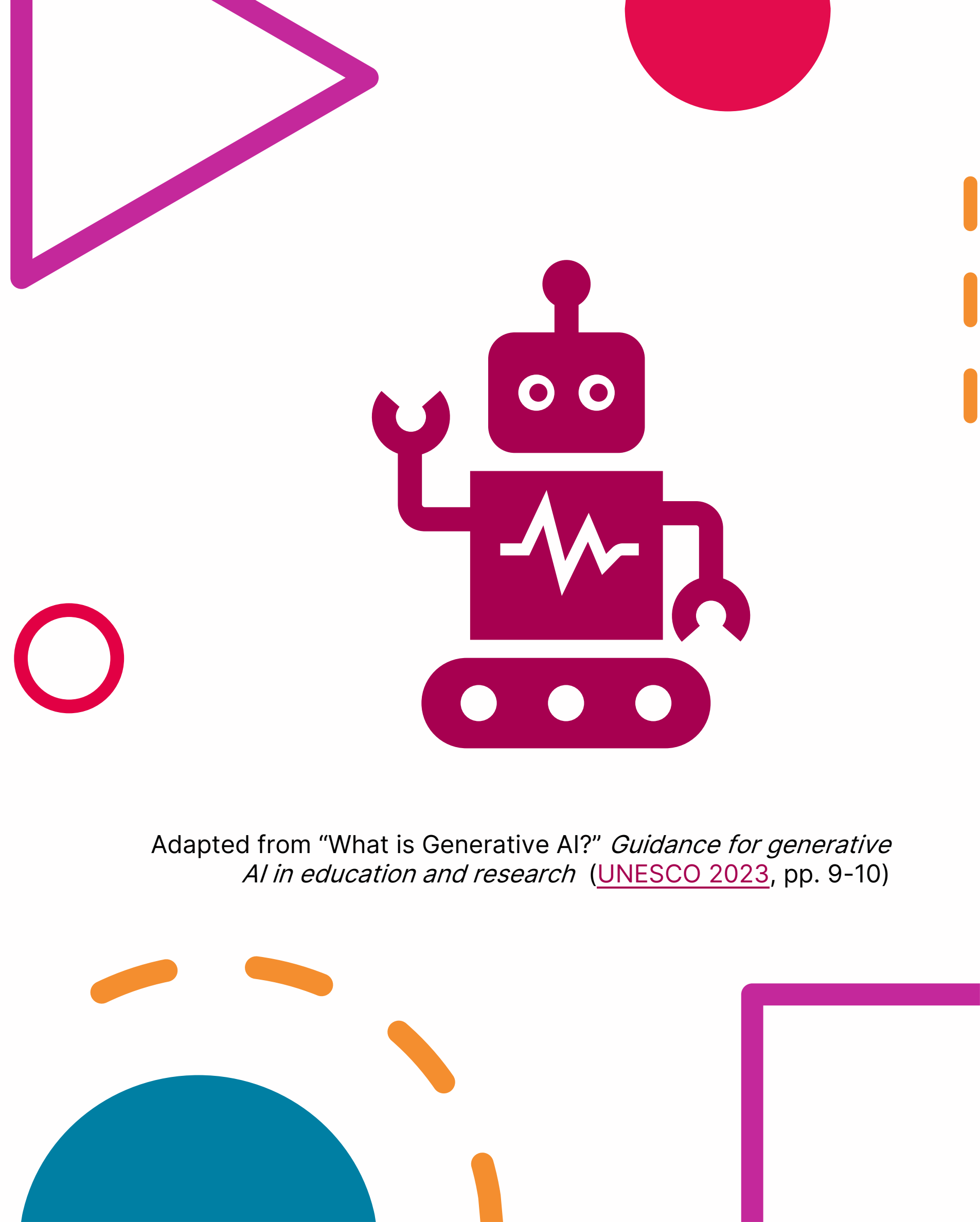
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Generating a Response from Prompt

1. The prompt is broken down into smaller units, called **tokens**, and converted to a machine-readable format.
2. The model uses statistical patterns to predict likely words or phrases that might form a coherent response to the prompt.
 - It identifies patterns of words and phrases that commonly co-occur in its training data.
 - These patterns are used to estimate the probability of specific words or phrases appearing in a given context.
 - Beginning with a random prediction, the AI uses these estimated probabilities to predict the next likely word or phrase in its response.
3. The predicted words or phrases are converted into readable text.
4. The readable text is filtered through what are known as **guardrails** to remove any offensive content.
5. Steps 2 to 4 are repeated until a response is finished.
6. The response is post-processed to improve readability by applying formatting, punctuation and other enhancements (such as beginning the response with words that a human might use, such as 'Sure', 'Certainly' or 'I'm sorry').

Adapted from "What is Generative AI?" *Guidance for generative AI in education and research* ([UNESCO 2023](#), pp. 9-10)

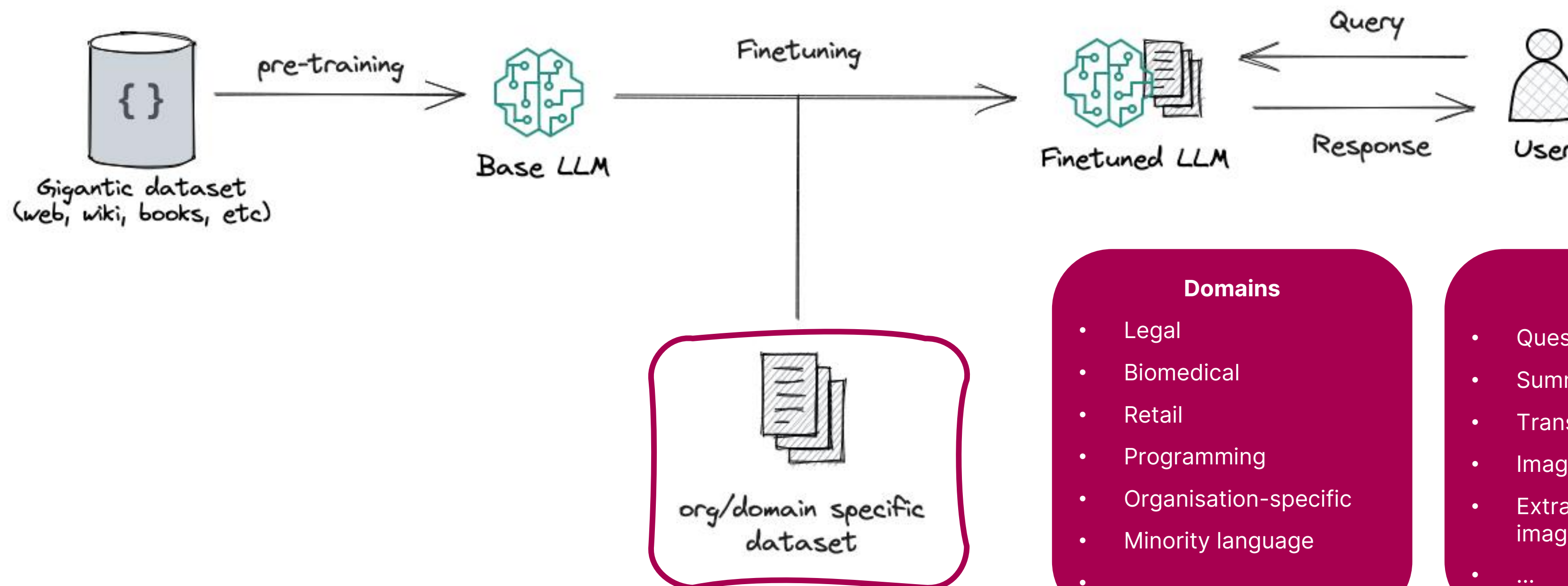


Fine-tuning



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Fine-tuning — taking pre-trained models and further training them on smaller, specific datasets to refine their capabilities and improve performance in a particular task or domain (**SuperAnnotate**)



Domains

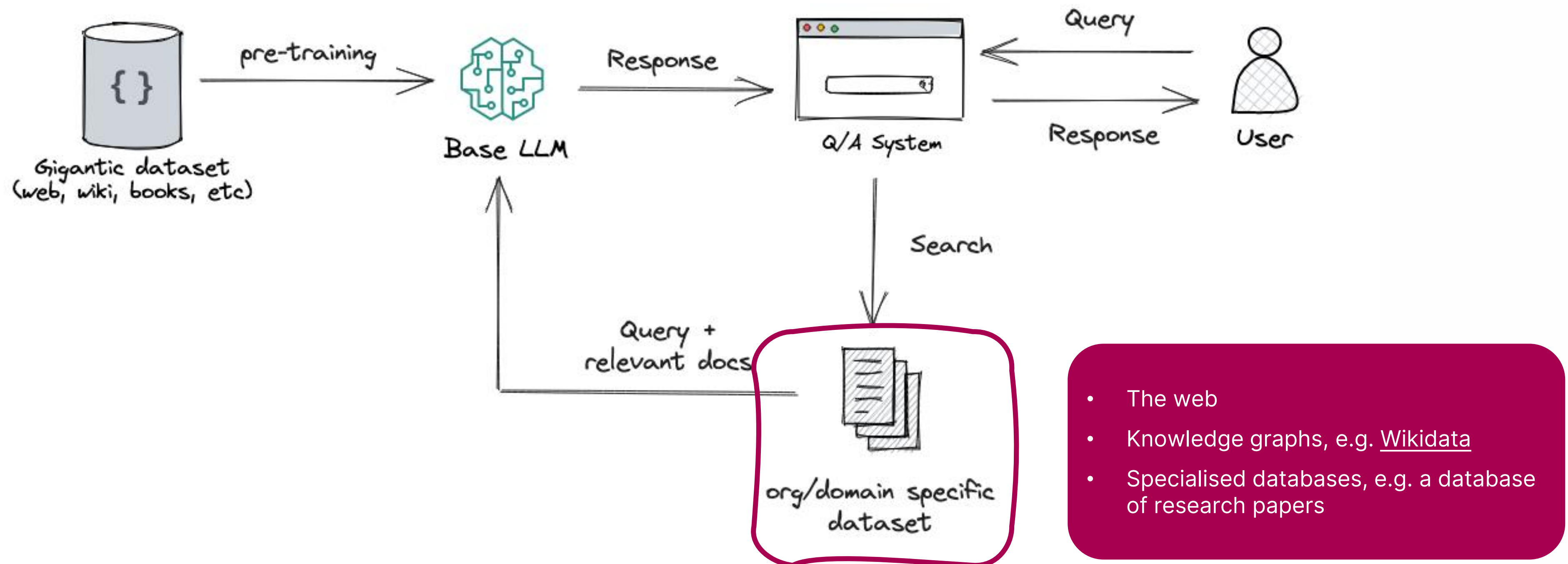
- Legal
- Biomedical
- Retail
- Programming
- Organisation-specific
- Minority language
- ...

Tasks

- Question answering
- Summarisation
- Translation
- Image captioning
- Extracting text from images (OCR)
- ...

Retrieval-Augmented Generation (RAG)

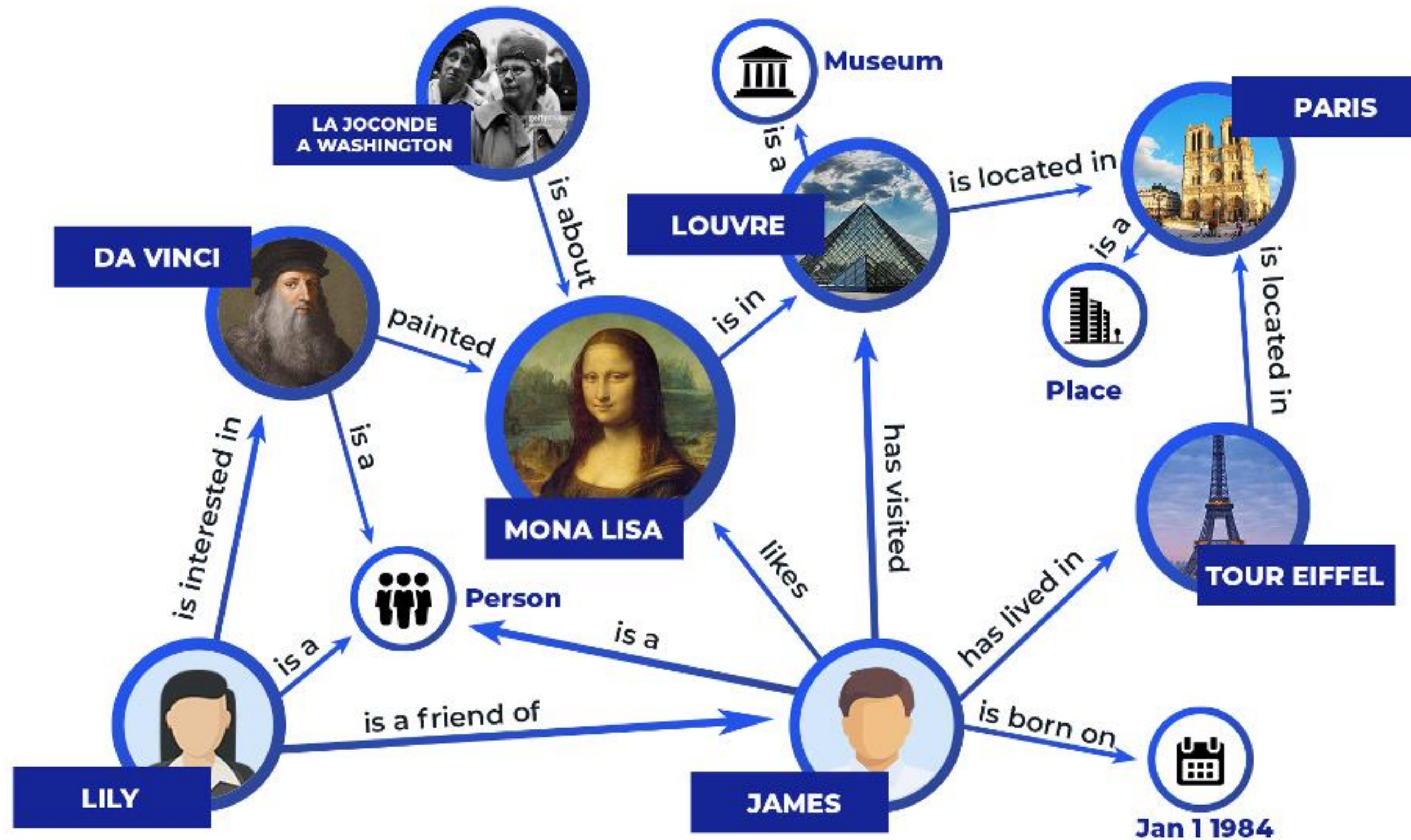
Retrieval-augmented generation (RAG) — the process of optimising the output of a large language model, so it references an authoritative knowledge base outside of its training data sources before generating a response ([Amazon](#); [Google](#)).



Knowledge Graph (KG)



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Specialised Databases



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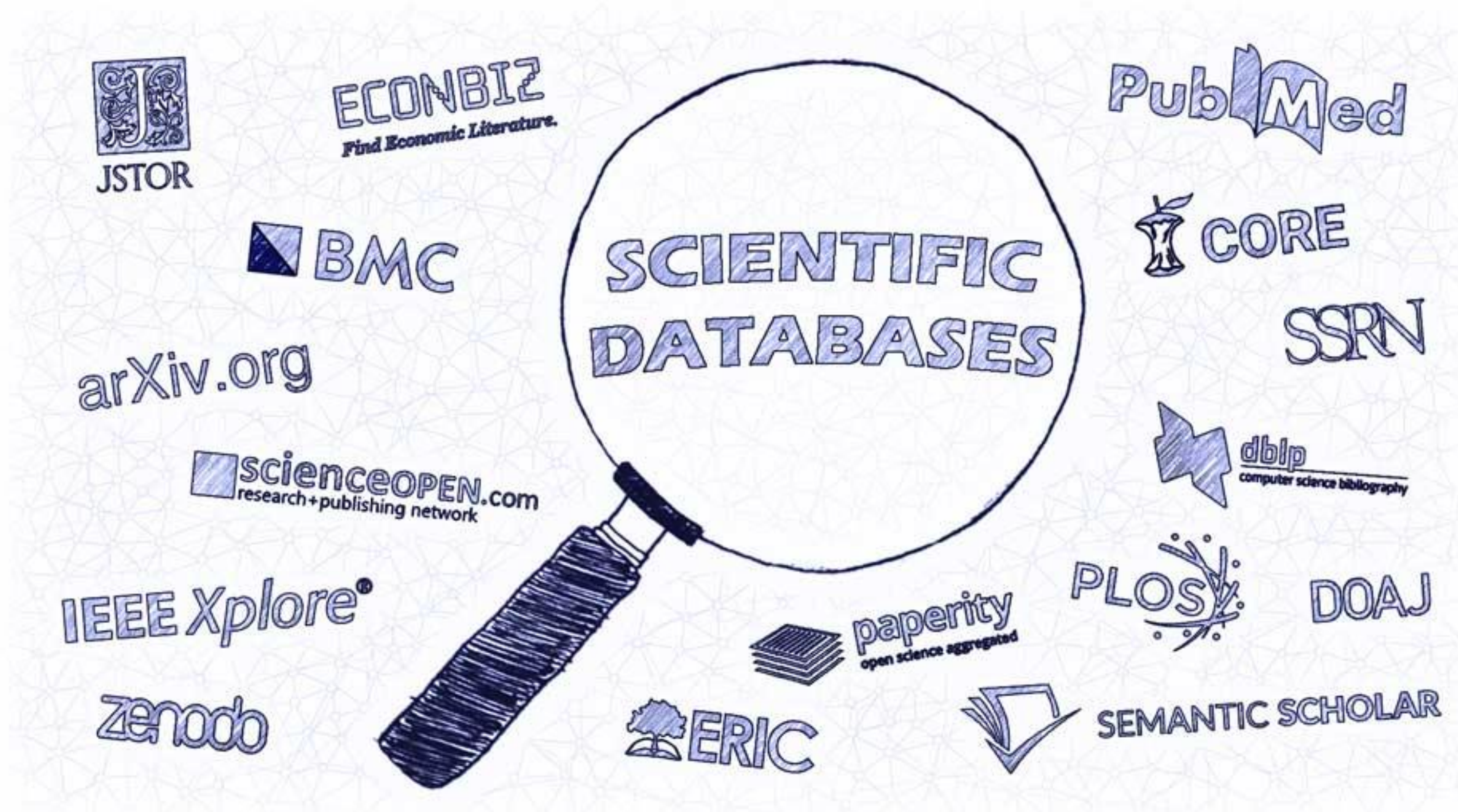


Image source: [Harry Li et al.](#)

Limitations of LLMs

Applies to any tool that has an LLM component!

- **LLMs don't know things and don't have human-like reasoning abilities.** Unlike humans, LLMs "learn" by statistically analysing the distributions of words, pixels or any other elements in the training data and identifying common patterns. They are simply trained to predict the next or missing element in a sequence, which lets them simulate the training data and generate responses that "make sense".
- **LLMs lack information verification mechanisms and can "hallucinate" (generate incorrect or unrelated answers)**, especially favouring familiar or frequently seen words. Moreover, an LLM would rather produce an incorrect answer than no answer at all: current evaluation procedures reward guessing over acknowledging uncertainty. This is why even the best models showing top results on evaluation benchmarks can be problematic for practical use.
- Even the best **LLMs lack consistency and reproducibility of results.** An LLM-based chatbot will produce a different output in response to the same prompt every time you query it. Moreover, LLMs are unable to maintain coherent internal reasoning without contradictions.

Limitations of LLMs



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- **LLMs aren't self-aware:** they have no way to reflect about their own knowledge or abilities. There is no use asking an LLM if it knows or has access to something: in the best-case scenario, you will get an answer hard-coded by its developers, and in the worst-case scenario, the model will generate a convincing, but meaningless response.
- LLMs don't have “**core beliefs**”; they'll generate responses for or against any topic, depending on the prompt, without holding any stance. If certain perspectives appear more often in their training data, the model may echo those more frequently, as it aims to reflect the most common responses.
- LLMs have **no sense of truth or morality**. While they may often reflect widely accepted facts, they can just as easily generate incorrect information if prompted, as they lack any inherent understanding of right or wrong.

Adapted from [*Introduction to Large Language Models without the Hype*](#) (Mark Riedl, 2023)

Limitations of LLMs



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- LLMs are **auto-regressive**, meaning each word guess becomes part of the input for the next guess, allowing **errors** to **accumulate**. Even a single mistake can cascade, with the model building further errors on top of it. LLMs can't self-correct or revise their outputs; they simply follow the sequence as it unfolds.
- The quality of the **output directly depends on the quality of the input**; better prompts yield better results. Experiment with different prompts to find what works best and check the guide on [prompt engineering](#).
- LLMs **aren't capable of true problem-solving or planning**, as they lack goals and the ability to look ahead. Instead, they can generate plans and solutions based on patterns they've learned from training data. While their outputs may resemble structured plans, they are essentially making **educated guesses** based on previous examples rather than actively evaluating alternatives or considering outcomes.

Adapted from [Introduction to Large Language Models without the Hype](#) (Mark Riedl, 2023)



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Best practices of using AI in research

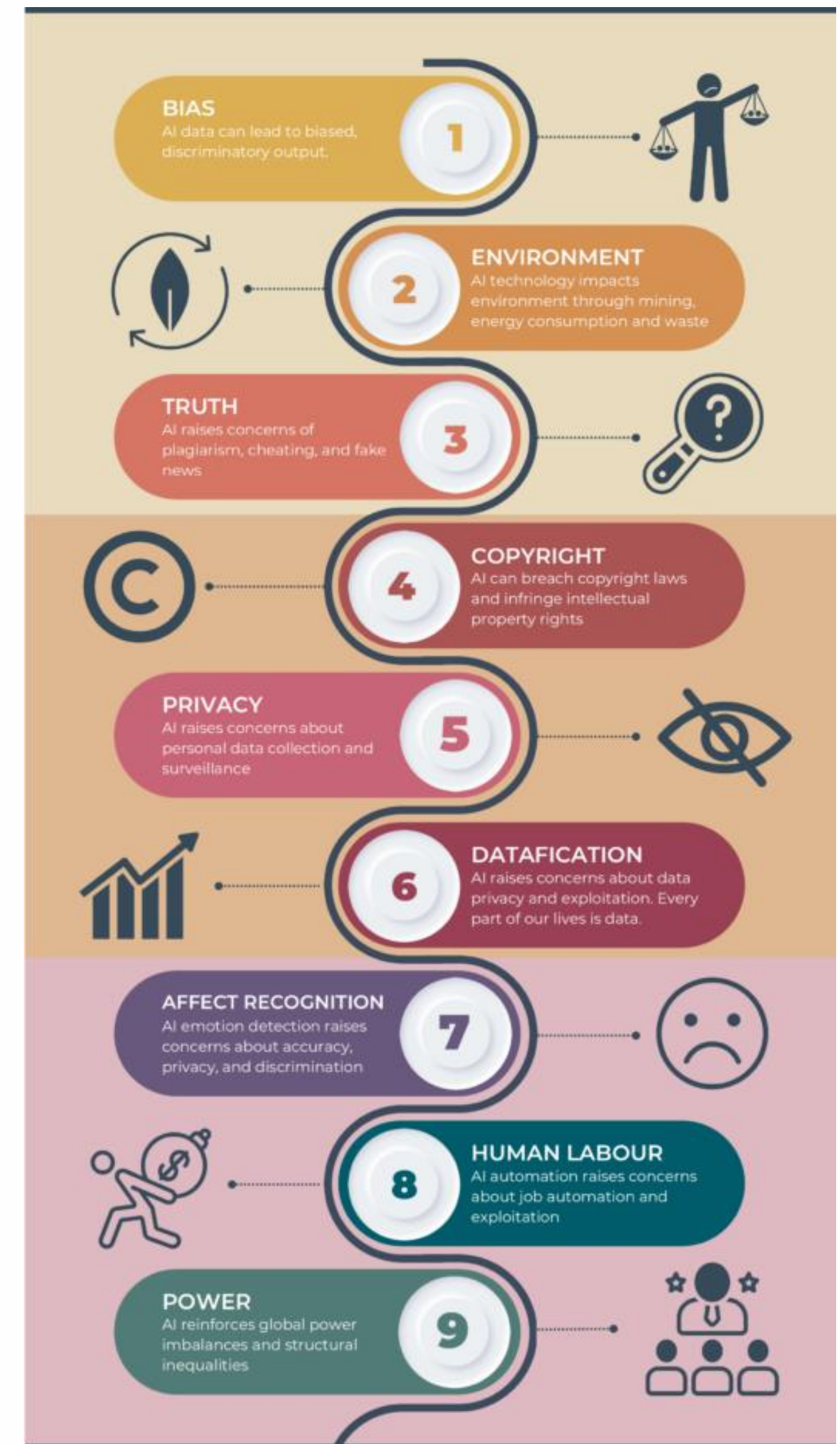
GenAI Concerns

- Bias & Fairness
- Data Privacy & Security
- Transparency & Explainability
- Hallucinations & Misinformation
- Copyright Infringement
- Sustainability & Environmental Cost
- Over-reliance on GenAI
- Inequality & Digital Divide

Read more:

- <https://libguides.library.universityofgalway.ie/AIforResearch/concerns>
- <https://airisk.mit.edu/>

Image source: [University of London](#)



Developing Responsible AI

FUTURE

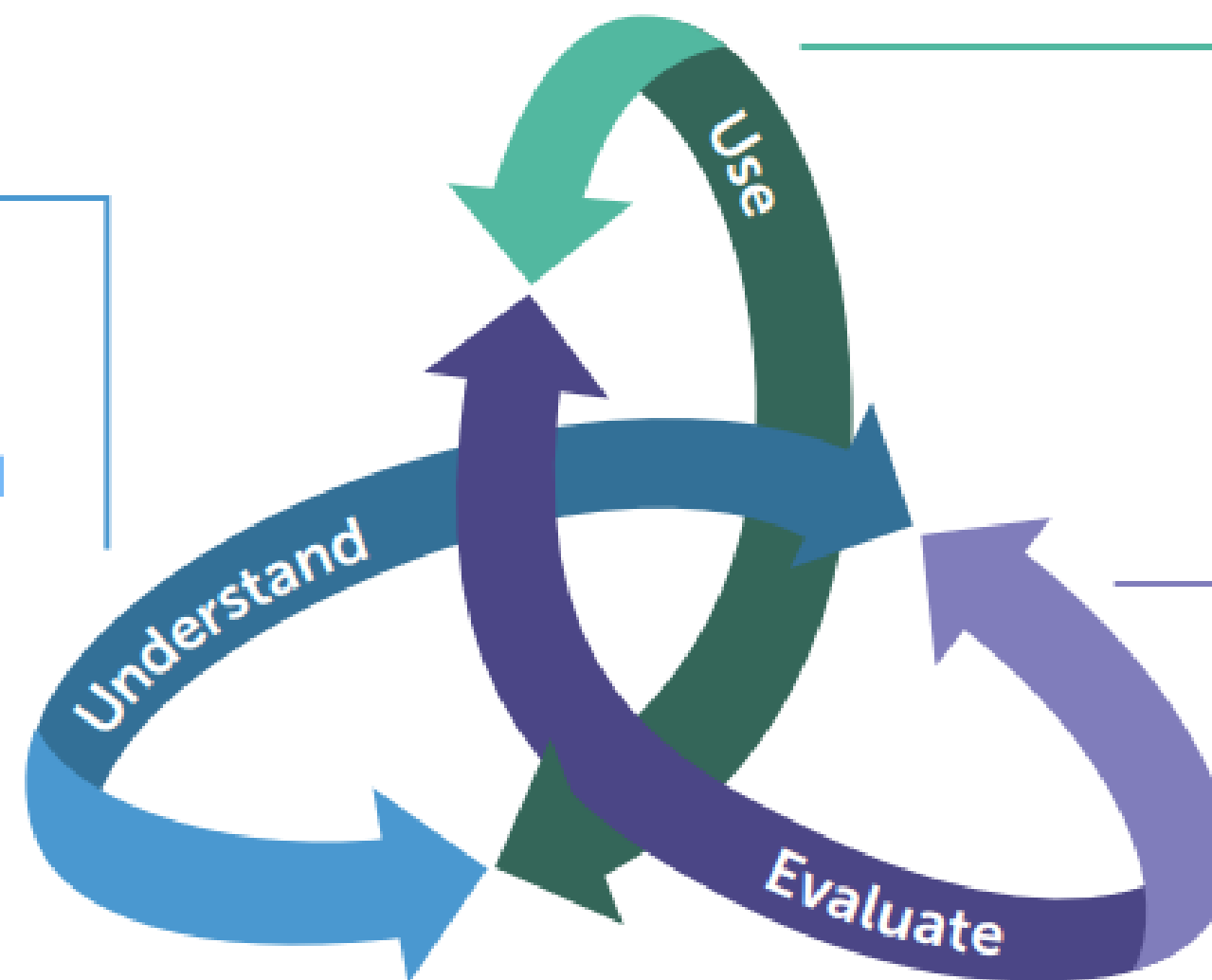


Ethical & Effective Use of GenAI

NOW

Understand:

Acquiring basic knowledge of what AI can do and how it works in order to make informed decisions about evaluating and using AI systems and tools.



Use:

Interacting, creating, and problem-solving with AI as a progression of use for distinct contexts and purposes.

Evaluate:

Centering human judgment and justice to critically consider the benefits and/or costs of AI to individuals, society, and the environment.

Best Practices of Using (Gen)AI in Research

- Be **curious** and be **critical**
- **Don't** feel like you're missing out if you aren't using GenAI
- **Do** remember that you're smarter than ChatGPT or any other language model
- **Don't** outsource creative/analytical work to GenAI
- **Do** use digital tools to save you time from time-consuming tasks that don't require much intellectual effort
- Choose **specialised tools** over general-purpose GenAI assistants
- If you need to analyse data and make predictions, use **traditional AI** (classification & regression ML models)





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- Check the University's [**Research Integrity Policy \(QA514\)**](#) and visit the University's website section on [**Research Integrity**](#).
- **Be transparent** about which tools you use and how you have used them in your research. A **disclosure statement** is often required as a section or appendix in your publication.
- Always [**cite and reference**](#) material included in your research outputs that is not your own work, including AI-generated content.
- **Don't ask AI to generate experimental data** and then present it as the data you have collected, whether in its raw form or after analysis. This is data fabrication and is considered serious misconduct.



Example of a Disclosure Statement

Statement on Generative Artificial Intelligence

I acknowledge the use of [insert AI system(s) and link] to [specific use of GenAI].

The prompts used were [list of prompts].

The output from these prompts was used to [explain use].





- **Keep detailed records of your interactions with GenAI.** Ensure you save the prompts, not just the outputs! Note that ChatGPT and some other tools don't keep a timestamp of when conversations took place — you will need to do this manually.
- Make sure to **save separate drafts** of your work and **keep notes** along the way to show that the final product is the result of your own progress and original thought.
- **Keep sensitive data away from GenAI** to avoid personal and experimental data leakage. Once your data is fed to a proprietary GenAI tool, there is no guarantee that it stays private and no way to check it.





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- Meticulously **fact-check** the information produced by GenAI and **verify the source of all citations** it uses to support its claims.
- **Critically evaluate** all AI output for any possible **biases** that can skew the presented information.
- When available, **consult developers' notes** to find out if the tool's information is up-to-date, and if it has access to a knowledge graph or a database for fact-checking.
- Keep in mind that general-purpose GenAI virtual assistants like **ChatGPT can't function as a calculator, encyclopedia, oracle or expert on any topic** by design.





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GenAI tools

Literature Review



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- Divide into groups of 2-3 based on your research area, e.g. law, biology, education...
- Pick a research topic/question that you are familiar with
- Use 3-5 tools from this list to find research papers on this topic
 - [Elicit](#)
 - [Consensus](#)
 - [Research Rabbit](#)
 - [Connected Papers](#)
 - [SciSpace](#)
- Discuss the results
 - Were the results relevant?
 - Were the results representative of the state-of-the-art research on the topic?
 - Did each tool provide different results, or were they similar?
 - Did you get better results compared to a standard [library search](#), searching [Google Scholar](#) or any of your [discipline-specific databases](#)?
 - Was the user experience better?
 - Did you get any insights compared to traditional search?

Baseline: Google Scholar

Google Scholar

ai adoption customer satisfaction

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The Impact of **Artificial Intelligence Adoption** on Jordanians' **Customers Satisfaction**

LM Abuhashesh, DA Momani, F Omeish... - ... on Advanced Intelligent ..., 2024 - Springer

... **satisfaction** in Jordan. The developed model in this research investigates how **AI adoption** affects **customer's satisfaction**... effects of **adopting artificial intelligence** on **customer satisfaction**. ...

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Customer satisfaction in service delivery with **artificial intelligence**: A meta-analytic study

LM Aguiar-Costa, CAXC Cunha, WKM Silva... - RAM. Revista de ..., 2022 - SciELO Brasil

... Because of little empirical evidence of **customer satisfaction** in **artificial intelligence**, since **AI** ... the variables of **customer satisfaction** in the **adoption** of **artificial intelligence** services since ...

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A study of **customer satisfaction** in using banking services through **Artificial Intelligence (AI)** in India

AA Shaikh, A Kumar, A Mishra, YA Elahi - Public Administration and ..., 2024 - emerald.com

... the complexities of **AI adoption**, this research scrutinizes the challenges and opportunities that arise, primarily focusing on understanding how **AI** positively impacts **customer satisfaction**. ...

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Transforming hospitality: the dynamics of **AI** integration, **customer satisfaction**, and organizational readiness in enhancing firm performance

M Ali, TI Khan, İ Şener - Journal of Hospitality and Tourism ..., 2025 - emerald.com

... This study will explore how organizational preparedness influences **AI adoption** and utilization to ensure organizations have cutting-edge tech and frameworks to apply it. Our research ...

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Impact of **artificial intelligence (AI)** chatbot characteristics on **customer** experience and **customer satisfaction**

Y Park, J Kim, Q Jiang, KH Kim - Journal of Global Scholars of ..., 2024 - Taylor & Francis

... in increasing the efficiency of **customer** service **AI** chatbots. First, ... **customer** service chatbots. Second, this study reveals the underlying mechanisms for increasing the intention to use **AI** ...

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LM Aguiar-Costa, CAXC Cunha, WKM Silva... - RAM. Revista de ..., 2022 - SciELO Brasil

Purpose: This study intends to identify the main background and consequent constructs that form consumer satisfaction in providing services using artificial intelligence (AI) and their ...

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The impact of artificial intelligence and employee service quality on customer satisfaction and loyalty

C Prentice, S Dominique Lopes... - Journal of Hospitality ..., 2020 - Taylor & Francis

The study discusses artificial intelligence (AI)-powered applications as a commercial service with a focus on the hotel industry. This research is approached from the customers' ...

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Gaining competitive advantage through artificial intelligence adoption

A Rosa, T Bento, L Pereira, RL Costa... - International ..., 2022 - inderscienceonline.com

Companies are adopting artificial intelligence (AI) to be innovative, improve their strategies and differentiate themselves from competitors. This research's objective is to examine the ...

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The impact of artificial intelligence on improving efficiency in service and implementing best practices in service marketing

S Kumar, MB Talukder, PK Tyagi - AI innovations in service and ..., 2024 - igi-global.com

The transformative effects of artificial intelligence (AI) on service efficiency and the use of best practices in service marketing are examined in this study. The authors have given an ...

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Integrating artificial intelligence and customer experience

Y Chen, C Prentice - Australasian Marketing Journal, 2025 - journals.sagepub.com

Artificial intelligence (AI) has been widely adopted in the service sector to enhance the customer experience and gain a competitive advantage. However, there are a limited ...

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<input type="checkbox"/> 2	Understanding continuance intention toward the use of AI chatbots in customer service among generation Z in Vietnam	Ngo, T.T.A., Phan, T.Y.N., Nguyen, T.K., ... Nguyen, N.T.A., Le, T.T.D.	Acta Psychologica, 259, 105468	2025	0
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Compare the document counts for up to 15 funding sponsors.

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Binus University	1
Consejería de Educación, Junta de Castilla-La Mancha	1
Fundamental Research Funds for the Central Universities	1
Fundação para a Ciência e a Tecnologia	1
Institute for Basic Sciences, technology and innovation	1
Instituto Superior de Economia e Gestão	1

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Compare the document counts for up to 15 countries/territories.

Country or territory	Documents
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Jordan	10
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China	9
United Arab Emirates	8
Indonesia	7
Malaysia	7
United Kingdom	7
Australia	6

Documents by author

Compare the document counts for up to 15 authors.

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Manoharan, G.	2
Metaxiotis, K.S.	2
Ngo, T.T.A.	2
Psarras, J.E.	2
Rana, N.P.	2
Rangaswamy, E.	2
Tiwari, D.	2
AL-Abrow, H.	1

Baseline: Web of Science

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☐ 1 ChatGPT and Conversational AI in Customer Satisfaction: A Preliminary Literature Review 19 References


Barzizza, E; Biasetton, N and Salmaso, L
52nd Italian Statistical Society Meeting-SIS
2025 | METHODOLOGICAL AND APPLIED STATISTICS AND DEMOGRAPHY III, SIS 2024 , pp.139-144
Chatbots powered by Generative Pre-trained Transformers (GPT) have emerged as a powerful tool in various domains, including customer satisfaction analysis. This work presents a preliminary literature review of the adoption of ChatGPT in the context of customer satisfaction. This preliminary work It examines existing research and literature reviews on ... Show more ▾
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☐ 2 Decoding user satisfaction: explainable artificial intelligence-based user-centric analysis of mobile health applications adoption 60 References

Rai, S; Bedi, J and Anand, A
Sep 2025 | KNOWLEDGE AND INFORMATION SYSTEMS ▾ 67 (9) , pp.7563-7596
Mobile health applications (mHealth) have revolutionized healthcare sector by leveraging mobile technology to provide personalized services. As a rapidly growing industry, mHealth aligns with the World Health Organization's goal of empowering patients to take control of their healthcare journey. In the realm of mHealth, ensuring user satisfacti ... Show more ▾
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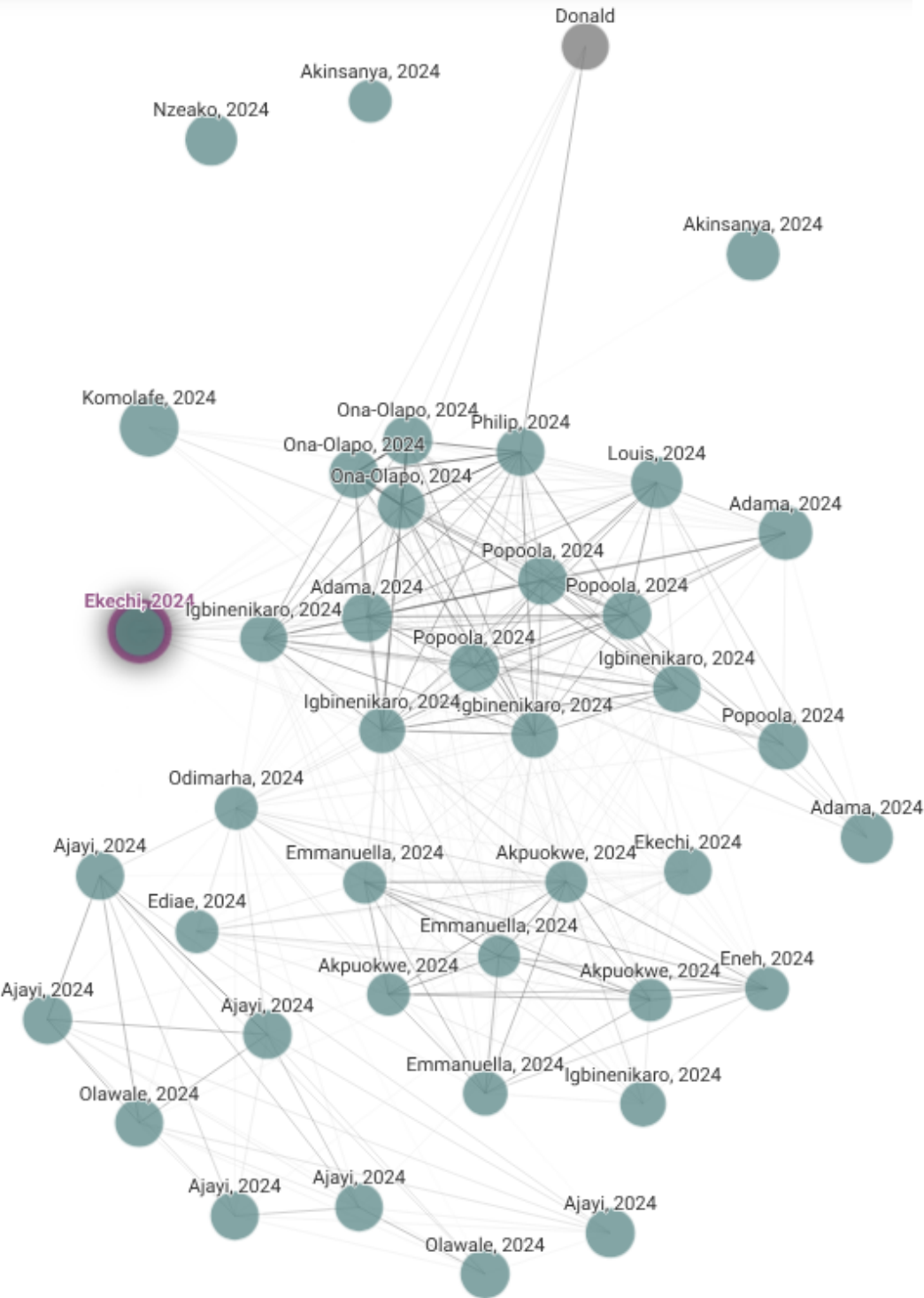
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Osayi Philip Igbinenikaro, Oladipo Olugbenga Adekoya, Emmanu... 2024

A comparative review of subsea navigation technologies in offshore engineering projects

Osayi Philip Igbinenikaro, Oladipo Olugbenga Adekoya, Emmanu... 2024

Conceptualizing sustainable offshore operations: integration of renewable energy systems





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Cynthia Chizoba Ekechi + 2 authors Chukwuekem David Okeke

2024, International Journal of Management & Entrepreneurship Research

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As organizations increasingly integrate artificial intelligence (AI)-infused chatbots into their customer support strategies, understanding user satisfaction becomes paramount. This abstract provides an overview of a cross-country evaluation that examines user experiences with AI-driven chatbots for customer support, drawing insights from both the USA and the UK. The evaluation explores the deployment of AI-infused chatbots in customer service scenarios, focusing on how users in these two regions interact with and perceive the effectiveness of chatbot interactions. The study considers the impact of cultural nuances, linguistic variations, and user expectations on the overall satisfaction with AI-driven customer support. In the USA, a market known for its technological adoption and diverse consumer landscape, the evaluation investigates how AI-infused chatbots contribute to enhancing customer experiences. It explores factors such as response time, accuracy, and the adaptability of chatbots in addressing diverse customer queries. In the UK, with its unique cultural and linguistic characteristics, the study examines how AI-driven chatbots align with customer expectations and preferences. It considers the role of chatbots in streamlining customer interactions, providing timely resolutions, and maintaining a high level of user satisfaction. Through a comparative analysis, the evaluation

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SEPTEMBER 24, 2025

The impact of AI adoption on user satisfaction with products and services in 2020-2025

Research from 2020-2025 across multiple sectors shows that AI adoption positively impacts user satisfaction when features like error recovery, adaptability, personalization, and reliable performance are present, while privacy risks and safety concerns reduce satisfaction.

ABSTRACT

Between 2020 and 2025, studies in multiple sectors—ranging from business software and customer service chatbots to healthcare and smart home devices—consistently report that specific features of AI adoption influence user satisfaction. * In business software contexts, one investigation using a 1–5 satisfaction scale found that better error recovery, adaptability, and customization increase scores by 0.21–0.25 points, while enhanced security and privacy contribute an additional 0.1-point gain. * Similarly, analyses employing sentiment-based measures indicate that ethical AI dimensions are strongly associated with satisfaction, particularly among non-technical users. *

Other studies reveal that utilitarian and hedonic gratifications positively predict satisfaction with chatbots, and a meta-analysis documented high correlations ($r = 0.63$ and $r = 0.86$) between empathy/interaction and consumer satisfaction. * In augmented reality applications for beauty and cosmetics, AI compatibility and relative advantage drive both affordance perception and adoption willingness, while in smart home products, attributes such as value for money and product quality significantly affect sentiment. * Across these diverse settings, factors such as intuitive interface design, personalization, and transparent, reliable performance emerge as common drivers of satisfaction, whereas perceived privacy risks and safety concerns tend to diminish it. *



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[Do Ethical AI Principles Matter to Users? A Larg...](#) ↗

1 of 3

Previous

Next

valued, or impactful from the perspective of users. This study investigates the link between ethical AI and user satisfaction by analyzing over 100,000 user reviews of AI products from G2. Using transformer-based language models, we measure sentiment across seven ethical dimensions defined by the EU Ethics Guidelines for Trustworthy AI. Our findings show that all seven dimensions are positively associated with user satisfaction. Yet, this relationship varies systematically across user and product types. Technical users and reviewers of AI development platforms more frequently discuss system-level concerns (e.g., transparency, data governance), while non-technical users and reviewers of end-user applications emphasize human-centric dimensions (e.g., human agency, societal well-being). Moreover, the association between ethical AI and user satisfaction is significantly stronger for non-technical users and end-user applications across all dimensions. Our results highlight the importance of ethical AI design from





The impact of AI adoption on user satisfact...
1 query

AI Adoption Significantly Enhances User Satisfaction with Products and Services, but Trust and Human Factors Remain Critical

AI adoption across industries in 2025 is strongly linked to **increased user satisfaction**, especially when AI systems deliver usefulness, reliability, and high service quality. However, user trust, privacy concerns, and the need for human interaction continue to shape satisfaction outcomes.



Key Drivers of User Satisfaction

- **Service Quality and Usefulness:** High-quality, reliable, and useful AI-enabled services consistently boost user satisfaction and drive continued use across sectors such as public services, hospitality, tourism, e-commerce, and wearables 1 3 4 8 12 18 .
- **Personalization and Engagement:** AI-driven personalization, omnichannel experiences, and recommendation systems enhance user engagement and loyalty, particularly in retail, banking, and digital services 10 11 17 .
- **Trust and Security:** Trust in AI, shaped by transparency, security, and ease of use, is a major mediator of satisfaction. Perceived privacy risks or lack of transparency can reduce satisfaction, even when AI delivers functional benefits 2 5 6 12 .

Moderating and Limiting Factors

- **Human Contact and Emotional Intelligence:** In some contexts, users still value human interaction, and AI's inability to replicate emotional intelligence can limit satisfaction, especially in service industries 6 7 .
- **Cultural and Demographic Differences:** Satisfaction with AI varies by culture, user experience, and company size, with factors like technology fear and personal competence influencing adoption and satisfaction 9 13 14 16 .
- **Challenges and Concerns:** Privacy, job displacement, and adaptation to new AI systems remain significant concerns that can temper satisfaction gains 7 2 .



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Search AI Customer Satisfaction

New Chat

Pricing

Initiating comprehensive research on AI adoption's impact on customer satisfaction (2020-2025)

I'll conduct a thorough search across multiple academic databases to find research papers on how AI adoption affects customer satisfaction with products and services from 2020-2025. Let me start with the mandatory primary searches and include specialized databases for this technology-focused topic.

Searched SciSpace impact of artificial intelligence adoption on customer satisfaction with products an... >

Searched Google Scholar "artificial intelligence adoption" AND "customer satisfaction" AND ("produ... >

Searched arXiv all:"artificial intelligence" AND all:"customer satisfaction" AND (all:"adoption" OR all:"... >

Searched PubMed ("artificial intelligence"[Title/Abstract] OR "AI"[Title/Abstract]) AND ("customer satisf... >

Search Results Summary

I've successfully completed searches across multiple academic databases for research on AI adoption's impact on customer satisfaction (2020-2025). Here are the results:

• SciSpace Database: 100 papers - Comprehensive collection focusing on AI adoption and customer satisfaction impact

• Google Scholar: 20 papers - Targeted search with specific boolean queries for products and services

• ArXiv: 14 papers - Technical papers on AI implementation and customer satisfaction

• PubMed: 20 papers - Healthcare-focused studies including patient satisfaction metrics

Ask anything or give follow up task...

65

Deep Search

Live Activity

Outputs

Searched SciSpace impact of artificial intelligence adoption on customer satisfaction with products and services

Filters

Relevance

Add Columns

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<input type="checkbox"/>	Papers (20)	Snippet	Abstract
<input type="checkbox"/>	<div>1. The Impact of Artificial Intelligence Adoption on Jordanians' Customers Satisfaction Mohammad Abuhashesh, Duha Anas Momani, Fandi Omeish +2 more 4 citations - 1st Jan '24 Journal Article DOI</div>	... effects of adopting artificial intelligence on customer satisfaction. Thus, it examines the ...	services meet customers' expectations and boost satisfaction. In addition, customer satisfaction ...
<input type="checkbox"/>	<div>2. The Impact of Artificial Intelligence Acceptance on Customer Satisfaction in the Telecommunication Industry in Egypt Munther Salim 1st Dec '24 - AI-Mağallah AI-'ilmiyyah Li-Iqtisād Wal Tiğārah (Print) Journal Article PDF DOI</div>	... customer satisfaction through better-designed AI services. This is particularly important in Egypt, where customer satisfaction ... Understanding artificial intelligence adoption in operations ...	
<input type="checkbox"/>	<div>3. Adoption of Artificial Intelligence in retail:</div>	... effect on the intention to use AI. H3	

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Advanced Web Search

<https://www.perplexity.ai/>

- Double-check everything, especially facts
- Look at cited sources
- Don't copy the results word-for-word



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What are the applications of AI in healthcare?

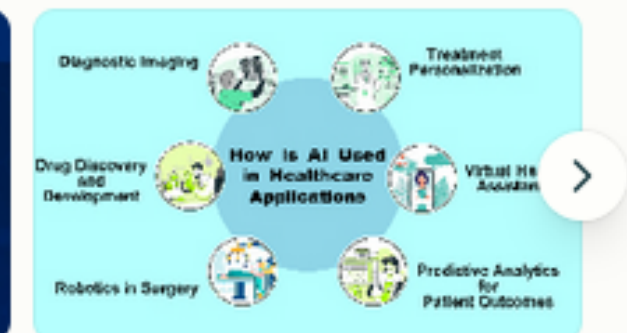
Answer Images Sources · 10 Steps

CAREFUL
7 Powerful Examples of Artificial Intelligence in...

Keragon
12 Real life Examples of AI in Healthcare

Wikimedia Foundation,...
Artificial intelligence in healthcare

AIMultiple
Generative AI Healthcare: 15 Use Cases with...



AI is widely used in healthcare for applications ranging from disease diagnosis and drug discovery to streamlining administration and delivering personalized medicine. Its ability to process large datasets and detect complex patterns is transforming clinical care, operations, and research across the sector. `careful` +5

Key Applications of AI in Healthcare

- **AI-Powered Diagnostics:** AI algorithms interpret X-rays, CT scans, MRIs, and other medical images, often identifying disease features invisible to the human eye and improving early detection of cancers, pneumonia, and diabetic retinopathy. `careful` +2
- **Precision Medicine & Drug Discovery:** AI helps customize treatment by analyzing a patient's genetics and lifestyle. It accelerates new drug discovery, predicts how drugs will work, and finds new uses for existing medications. `research.aimultiple` +2
- **Virtual Nursing Assistants:** AI chatbots and virtual nurses offer 24/7 patient support—answering questions about symptoms, medication adherence, and care instructions, especially for remote or immobile patients. `foreseemed` +1

Organising Information



Sources

+ Add

Discover

Saved sources will appear here

Click Add source above to add PDFs, websites, text, videos or audio files. Or import a file directly from Google Drive.

Chat

<https://notebooklm.google.com/>

- Double-check every fact and conclusion made by the model
- Don't upload anything that isn't already on the web (e.g. unpublished papers or reports)
- Don't upload anything that contains sensitive data

Upload a source to get started

0 sources

Studio

Audio Overview

Video Overview

Mind Map

Reports

Flashcards

Quiz

Studio output will be saved here.

After adding sources, click to add Audio Overview, study guide, mind map and more!

Google NotebookLM

Add note

NotebookLM can be inaccurate; please double-check its responses.



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Prompt engineering

Prompt Engineering



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Prompt — an input that a user feeds to a generative AI.

Prompt engineering — a process of creating and refining instructions used as input to a generative AI system to get high-quality outputs ([Amazon](#)).

Works best for LLMs and general-purpose GenAI chatbots; task-specific tools may have some hard-coded prompts letting you simply use keyword search or a one-line question

- ChatGPT
- Google Gemini
- Claude
- DeepSeek
- ...

Read more

- <https://libguides.library.universityofgalway.ie/AIforResearch/prompting>
- <https://mirascope.com/blog/prompt-engineering-examples>
- <https://cloud.google.com/discover/what-is-prompt-engineering>

Types of Prompting



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- **System message** — give the tool a persona or function to limit the perspectives it will approach a task from
- **Zero-shot** — prompting the tool with no examples and building context into the original prompts
- **Few-shot** — provide the tool with a couple of examples or build up to the ultimate task by breaking the prompt down to several steps
- **Chain-of-thought** — start from an idea and ask the tool to provide some thoughts on it, then shape further prompts based on its responses
- **Context-expansion** — start from a premise and ask the tool to identify "5 Ws and a How" to build on your original premise
- **"Be on your toes"** — ask the tool to be on its guard and look for ulterior motives when it answers your query

CLEAR framework

- **Concise** — while additional detail can provide context, cluttering your prompt with superfluous details can confuse the tool or cause it to get lost in the details
- **Logical** — providing information in a structured format with a logical flow will improve your results
- **Explicit** — to get specific, clear responses you will need to give specific, clear instructions: define the task, set parameters, and give a precise call to action
- **Adaptive** — being flexible and willing to try multiple approaches will reduce hallucinations and produce more relevant outputs
- **Reflective** — be critical! Evaluate and fact-check the responses you get, keep hold of strategies and prompts that work, prompting is a continual process



CREATE framework



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- **Character** — who will AI be? Gives the model a context and perspective and can help limit the types of sources the tool draws information from or the tone of the output.
- **Request** — specific instructions for what you want the model to achieve.
- **Examples** — offers the model something to build on (few-shot learning).
- **Adjustments** — writing prompts is an iterative process, and first drafts are hardly ever perfect!
- **Type** — what type of output are you expecting? A table, bullet points, summary image
- **Extras** — additional instructions or steps such as "ask me questions before you answer" or "ignore previous prompts".



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Support & Resources

Relevant Policies



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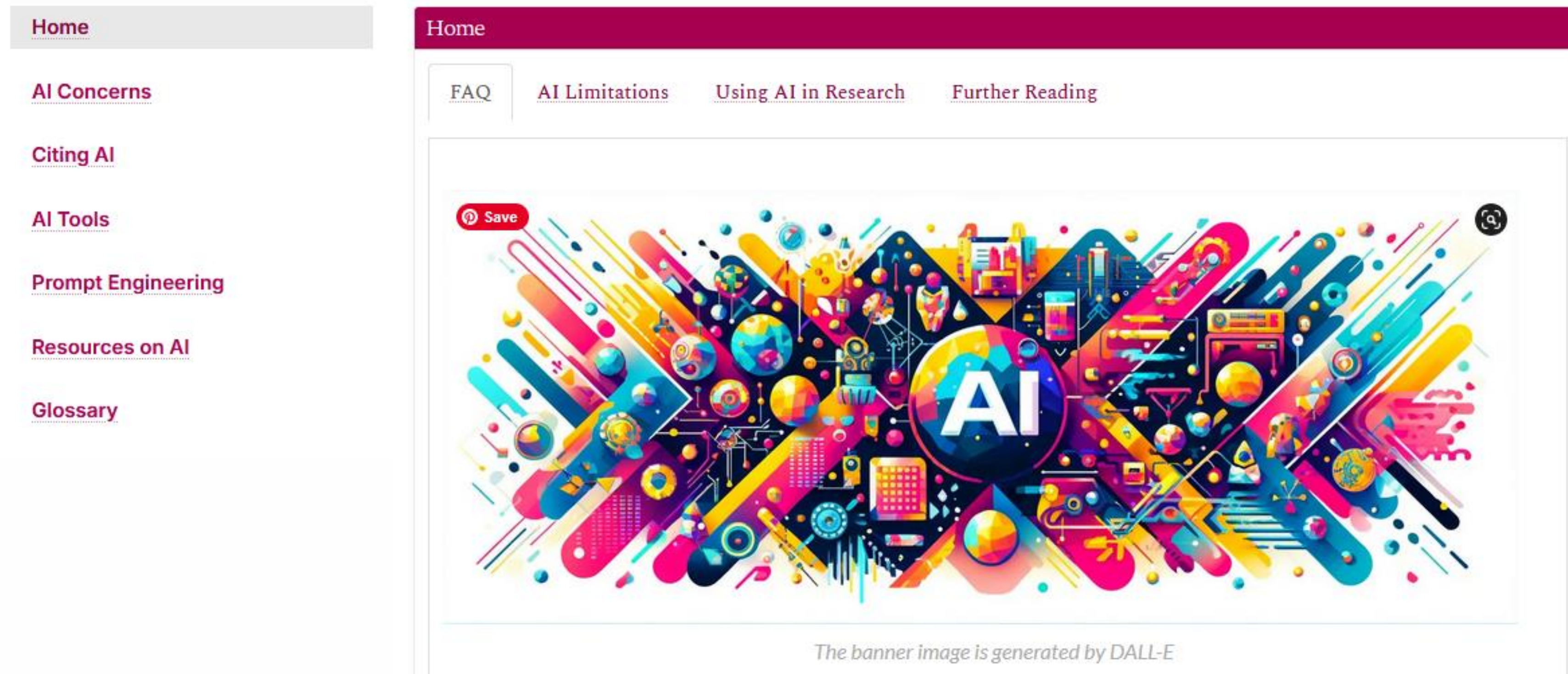
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AI for Research Guide



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<https://libguides.library.universityofgalway.ie/AIforResearch>



AI Reading List

Books on AI available in the Library

- Non-fiction
- Theory
 - AI Ethics
- Practice
 - Machine Learning (ML)
 - Natural Language Processing (NLP)
 - Prompt Engineering
- AI Applications



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[Table of Contents](#) [Type: All](#) [Filter: All](#) [Citation Style: No...](#)

Non-fiction

Non-fiction books on Artificial Intelligence

Empire of AI : dreams and nightmares in Sam Altman's OpenAI
Book - by Hao, Karen - 2025
[VIEW AVAILABILITY](#)

Artificial intelligence: a guide for thinking humans
Book - by Melanie Mitchell - 2020
[VIEW AVAILABILITY](#)

A 2019 non-fiction book by Melanie Mitchell, professor of computer science at Portland State University and external professor at the Santa Fe Institute. In "Artificial Intelligence", Mitchell turns to the most urgent questions concerning AI today: How intelligent—really—are the best AI programs? How do they work? What can they actually do, and when do they fail? How humanlike do we expect them to become, and how soon do we need to worry about them surpassing us? Along the way, she introduces the dominant methods of modern AI and machine learning, describing cutting-edge AI programs, their human inventors, and the historical lines of thought that led to recent achievements. She meets with fellow experts like Douglas Hofstadter, the cognitive

Natural Language Processing (NLP)

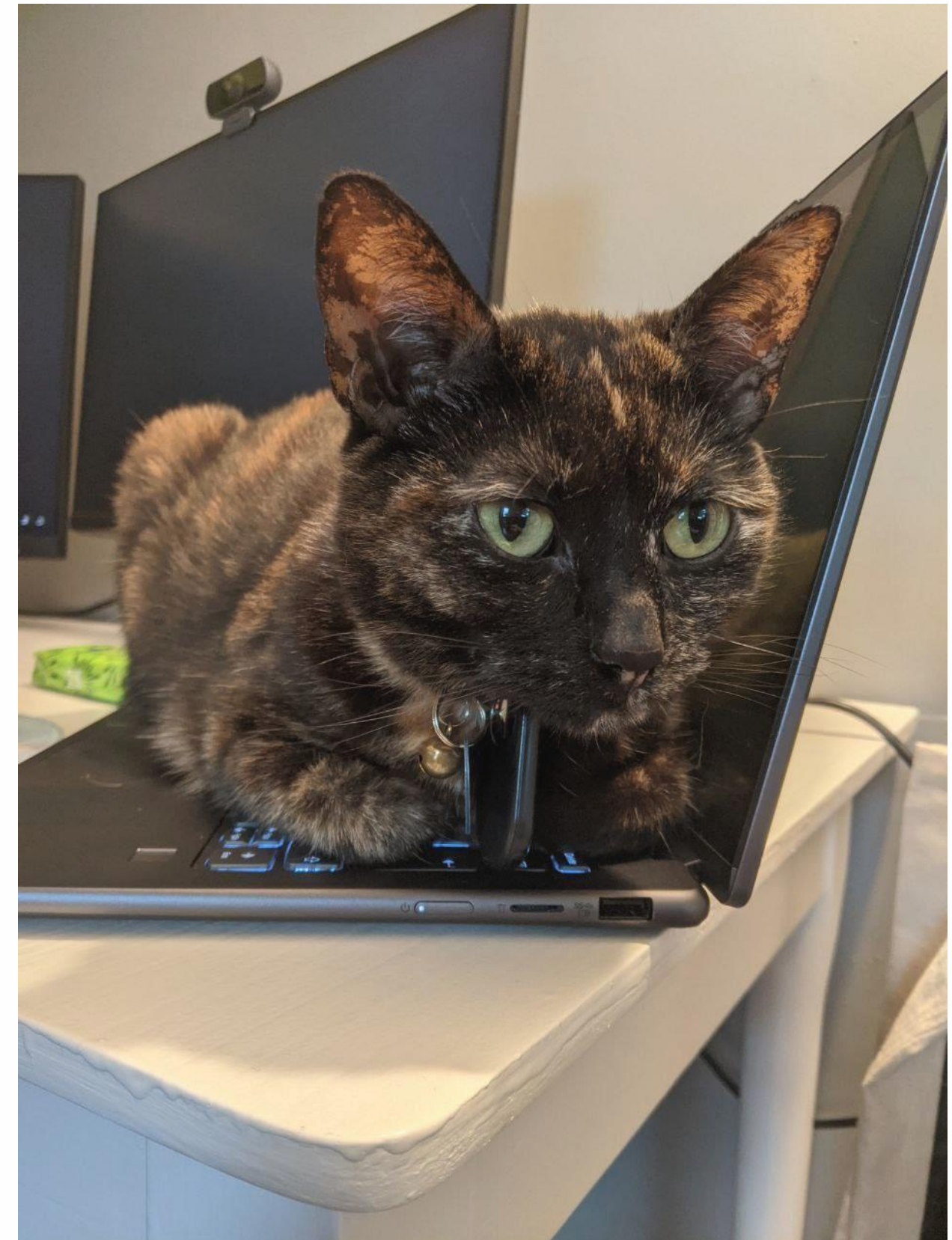
Natural Language Processing with Transformers
Book - by Lewis Tunstall; Leandro von Werra; Thomas Wolf - 2022
[VIEW ONLINE](#)

Transformers for Natural Language Processing and Computer Vision: Explore Generative AI and Large Language Models with Hugging Face, ChatGPT, GPT-4V, and DALL-E 3
Book - by Denis Rothman - 2024 - 3rd ed.
[VIEW ONLINE](#)

You can always email me for a consultation!

*You may accidentally receive a response from my smart non-AI assistant 🐱

oksana.dereza@universityofgalway.ie



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