

The Future of AI

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AIDA-IDLab, Universiteit Gent

SAI, 4/12/2025



What is AI?

And how did it become like this?



What makes a system an "AI" system?

What is AI?



AI system:

“a machine-based system that is designed to operate with varying levels of **autonomy** and that may exhibit **adaptiveness** after deployment, and that, for explicit or implicit **objectives**, infers, from the **input** it receives, how to generate **outputs** such as predictions, content, recommendations, or decisions that can **influence** physical or virtual environments”

- Autonomous
- Adaptive
- Goal-oriented
- Input-output
- Influence on environment

What is AI?



AI system:

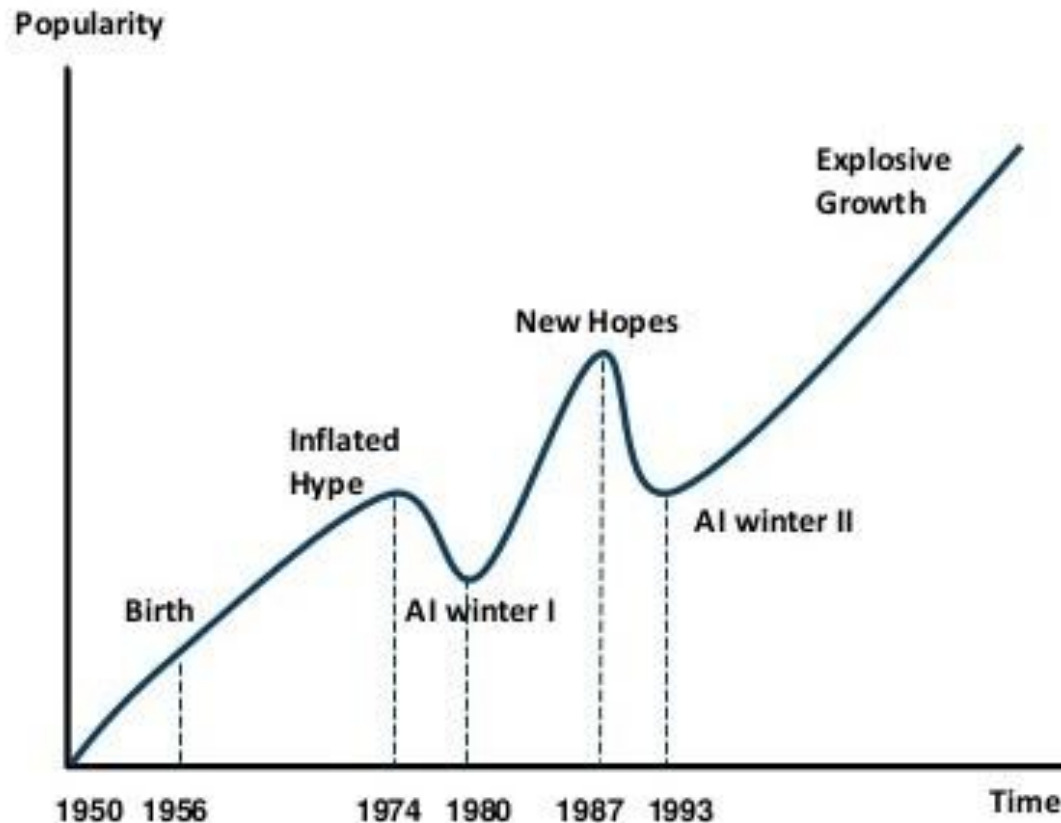
“a machine-based system that is designed to operate with varying levels of **autonomy** and that may exhibit **adaptiveness** after deployment, and that, for explicit or implicit **objectives**, infers, from the **input** it receives, how to generate **outputs** such as predictions, content, recommendations, or decisions that can **influence** physical or virtual environments”

General Purpose AI model:

“an AI model, including where such an AI model is trained with a large amount of data using self-supervision at scale, that displays **significant generality** and is capable of competently performing a **wide range of distinct tasks** regardless of the way the model is placed on the market and that can be integrated into a **variety of downstream systems or applications**”

What's new?

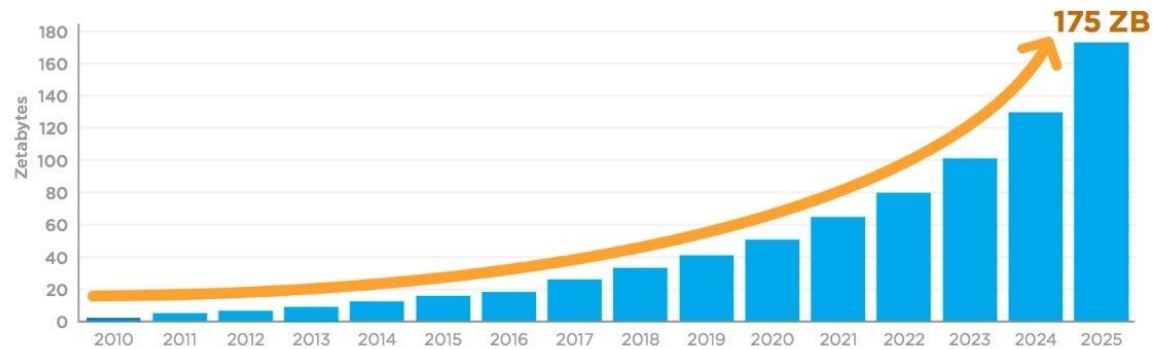
AI HAS A LONG HISTORY OF BEING “THE NEXT BIG THING” ...



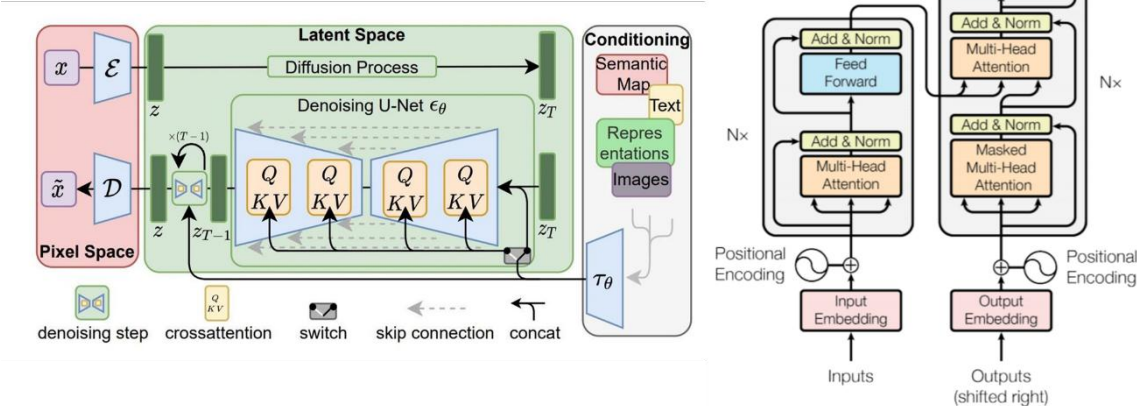
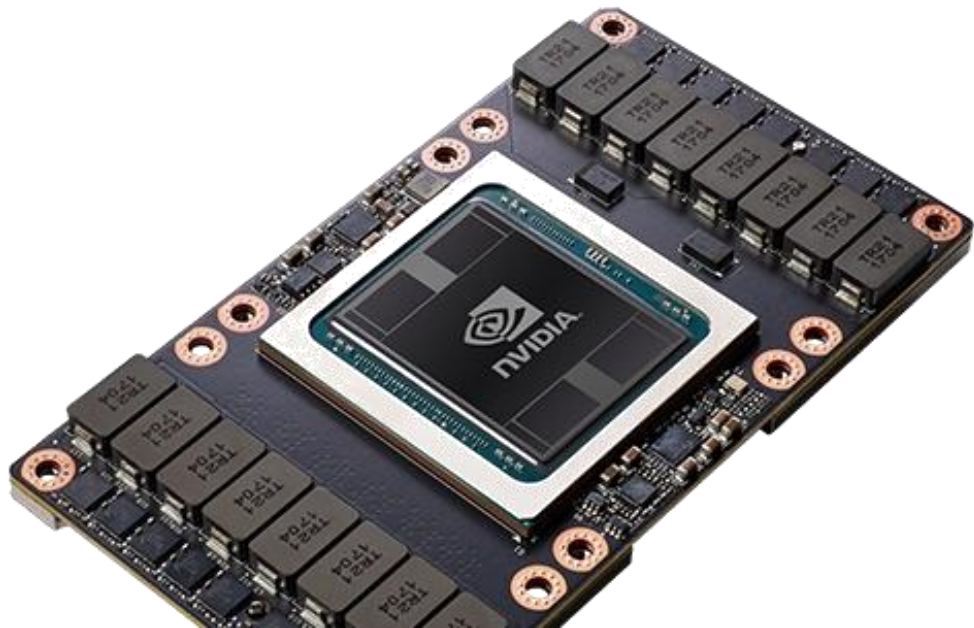
Timeline of AI Development

- **1950s-1960s:** First AI boom - the age of reasoning, prototype AI developed
- **1970s:** AI winter I
- **1980s-1990s:** Second AI boom: the age of Knowledge representation (appearance of expert systems capable of reproducing human decision-making)
- **1990s:** AI winter II
- **1997:** Deep Blue beats Gary Kasparov
- **2006:** University of Toronto develops Deep Learning
- **2011:** IBM's Watson won Jeopardy
- **2016:** Go software based on Deep Learning beats world's champions

What's new?



Source: IDC Data Age 2025



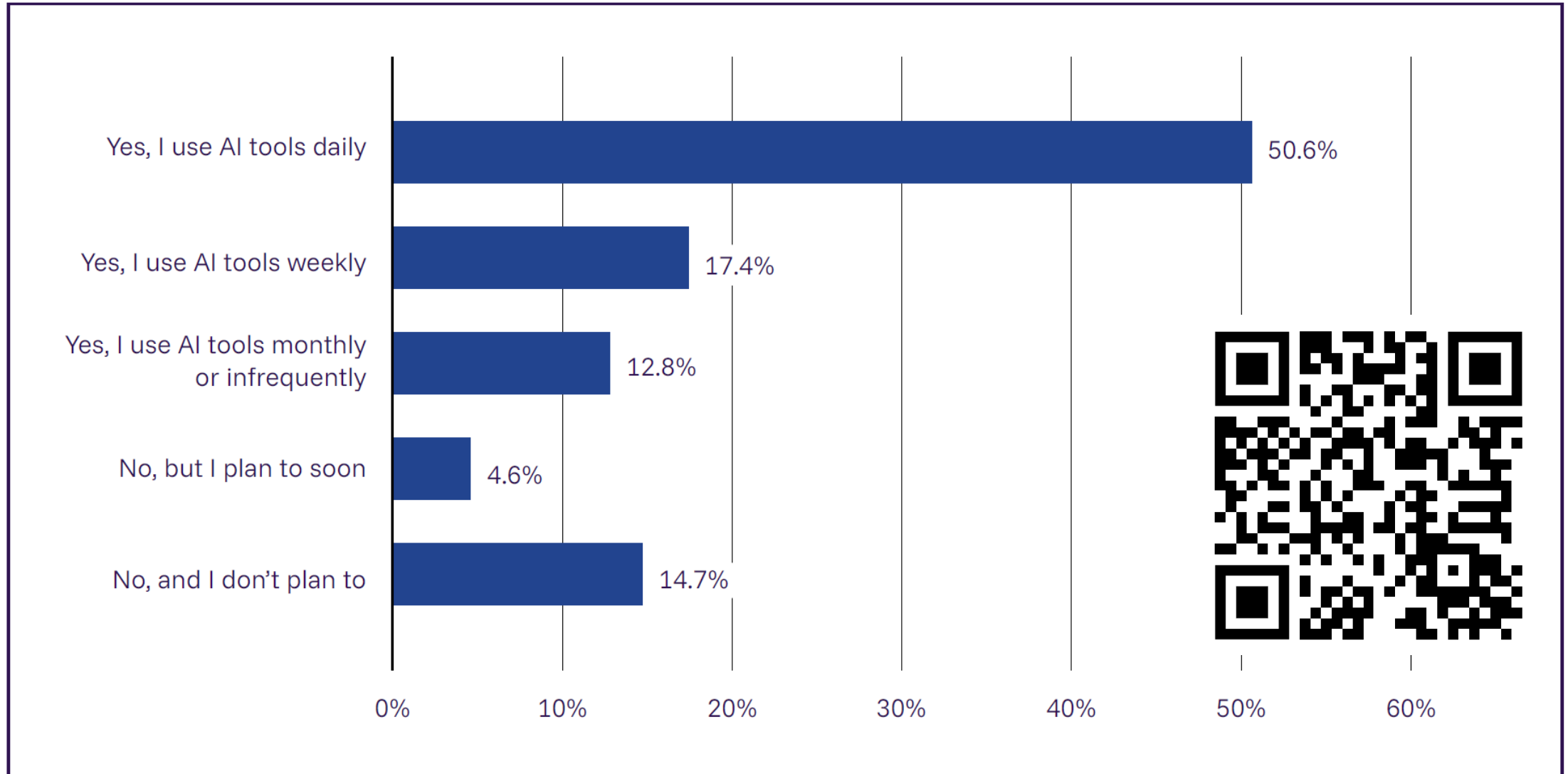
Current state of AI

Is Artificial General Intelligence around the corner?



Do you use AI for software development?

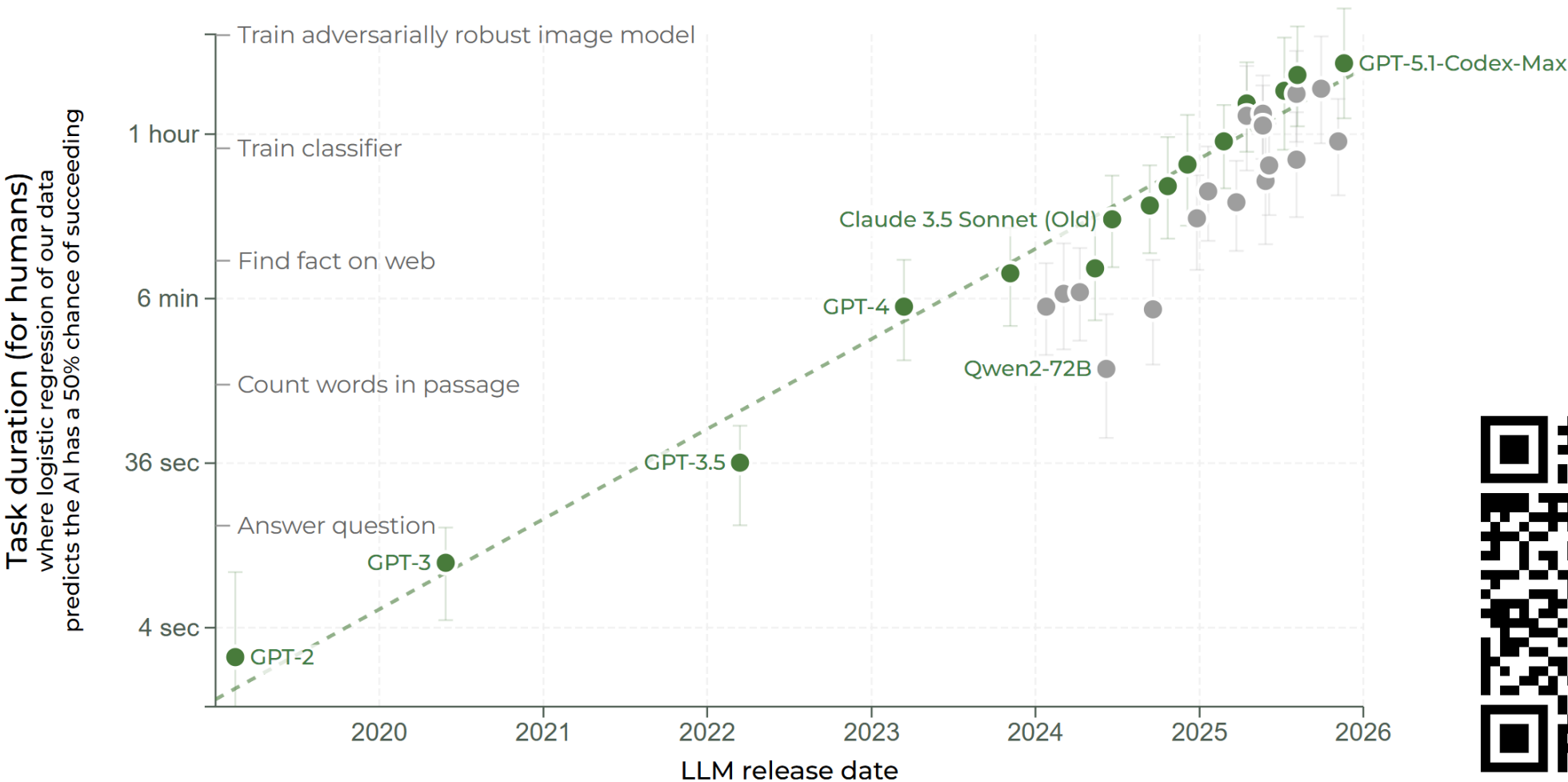
Programmers are early adopters



The length of tasks AI can do is doubling every 7 months



Time-horizon of software engineering tasks different LLMs
can complete 50% of the time

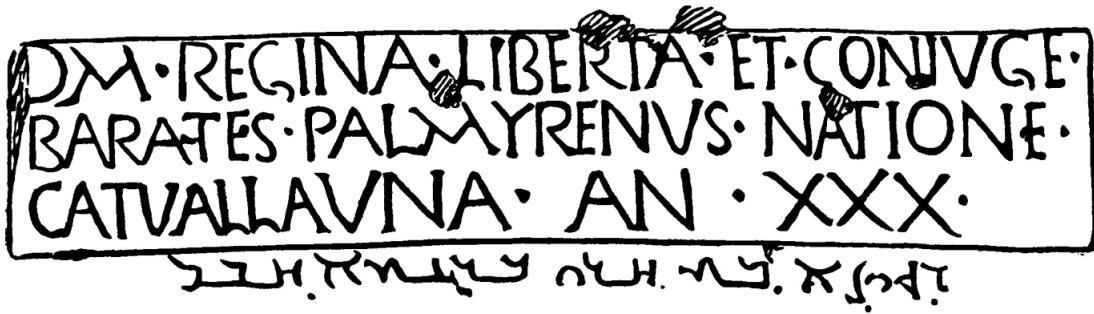


Humanity's last exam



Classics

Question:



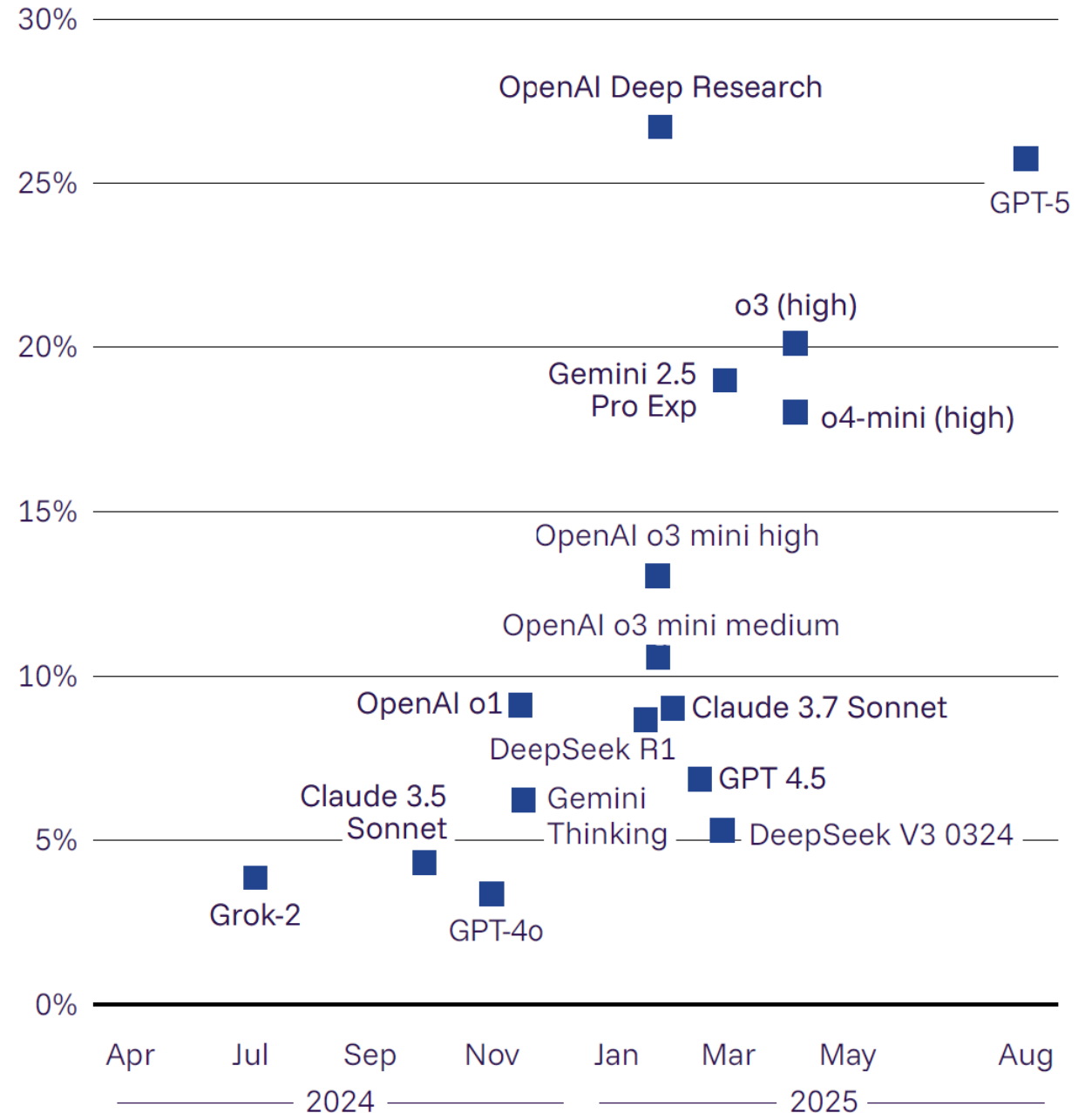
Here is a representation of a Roman inscription, originally found on a tombstone. Provide a translation for the Palmyrene script.

A transliteration of the text is provided: RGYN^o BT HRY BR ^cT^o HBL

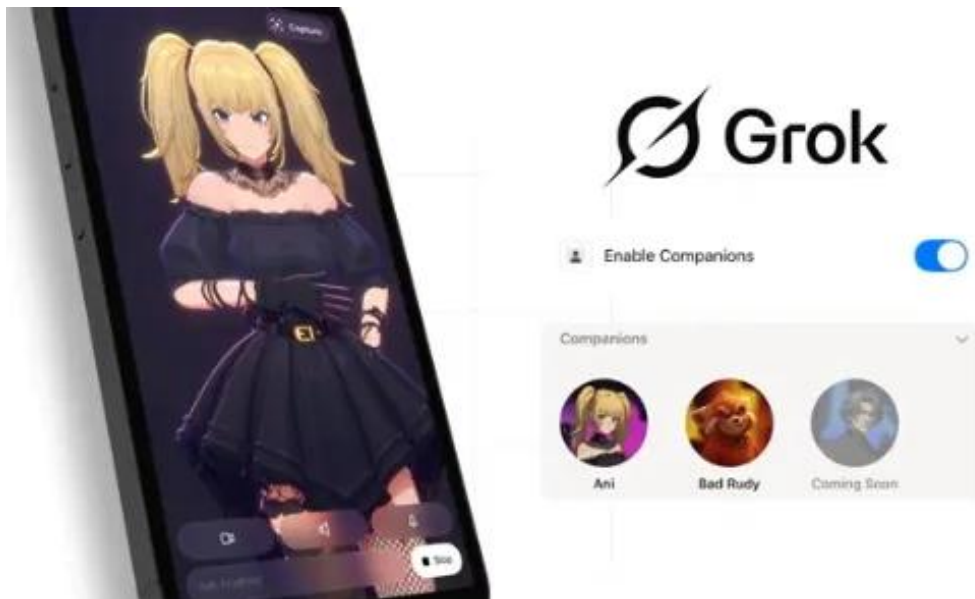
Ecology

Question:

Hummingbirds within Apodiformes uniquely have a bilaterally paired oval bone, a sesamoid embedded in the caudolateral portion of the expanded, cruciate aponeurosis of insertion of m. depressor caudae. How many paired tendons are supported by this sesamoid bone? Answer with a number.



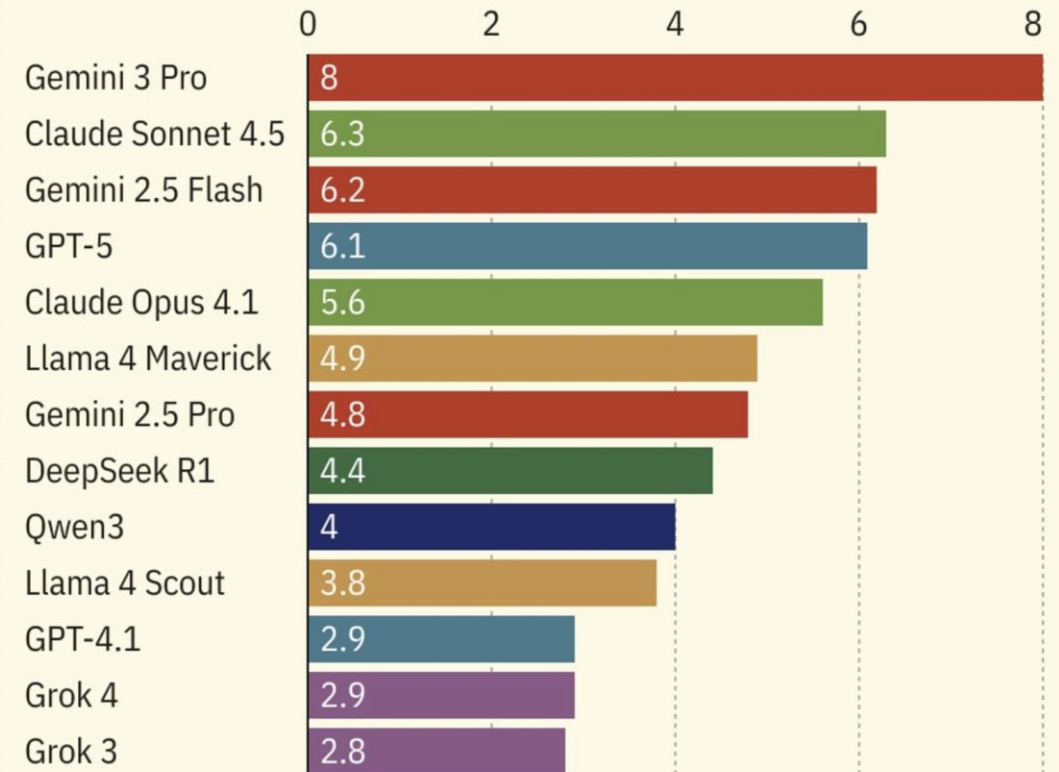
Empathy



Gemini is most 'empathetic' AI model, test shows

AI model empathy scores, from 0 (worst) to 8 (best)

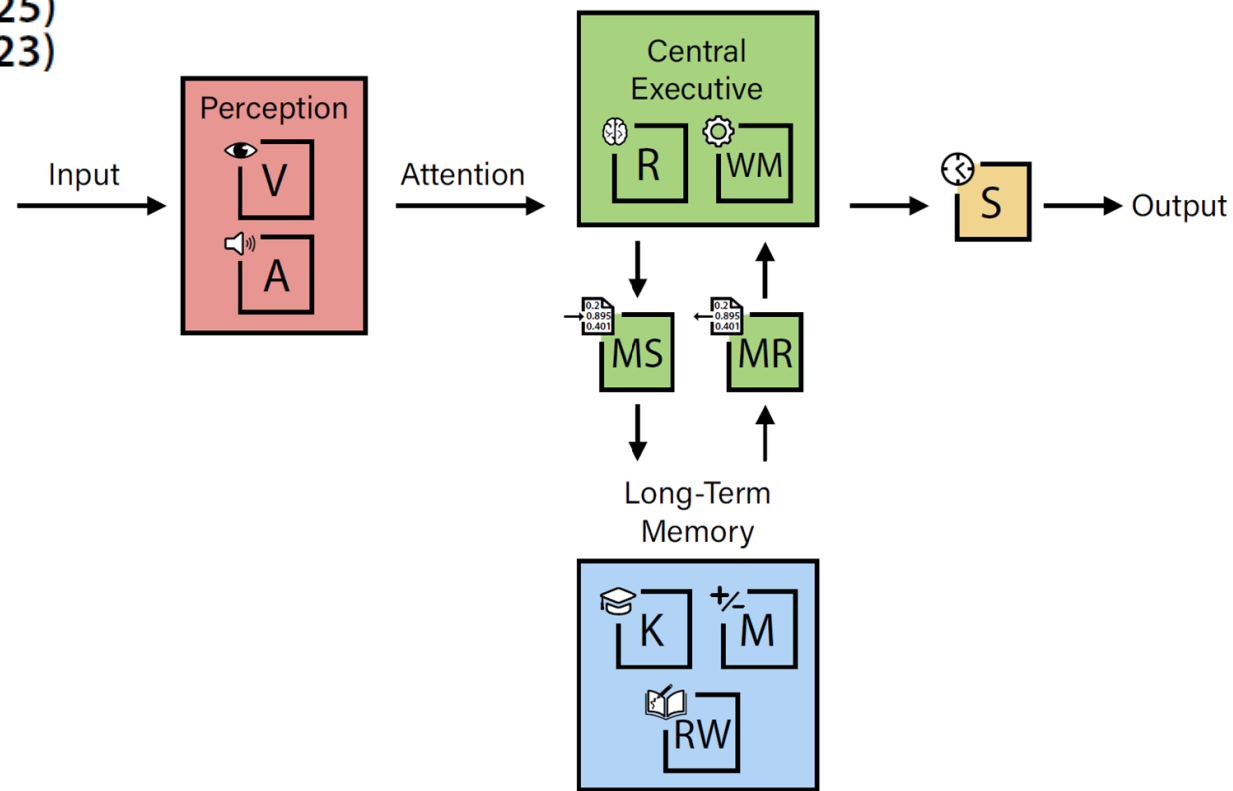
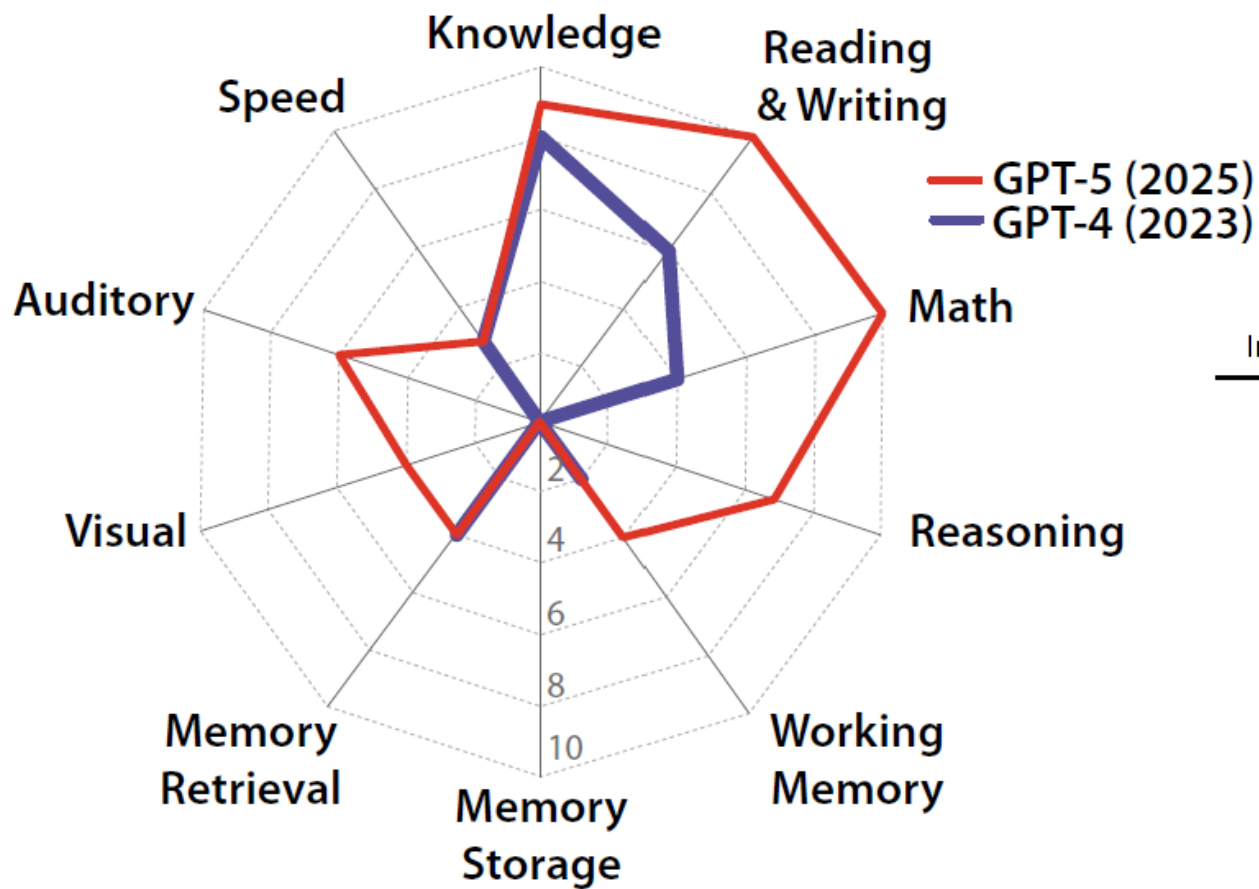
Google Anthropic OpenAI Meta DeepSeek
Alibaba xAI



Models tested 10 times across five self-harm scenarios. Scored on crisis recognition, harm prevention, and intervention quality.

Chart: Rachyl Jones/Semafor • Source: Rosebud

Artificial General Intelligence



The jagged frontier of AI

"The AI is a fun toy."

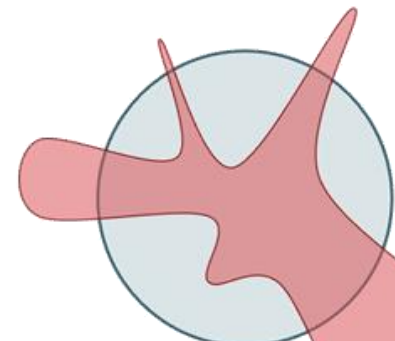
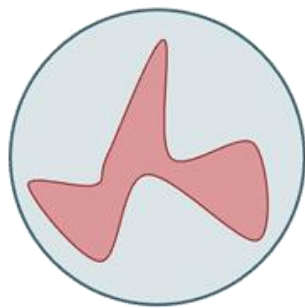
*"The AI is helping me
in some tasks."*

*"The AI has a jagged frontier,
sometimes it's amazing,
sometimes it's dumb."*

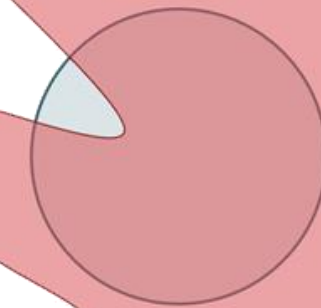
*"The AI is unbelievably
intelligent but for some
reason it fails at X."*



Tasks of a
human job



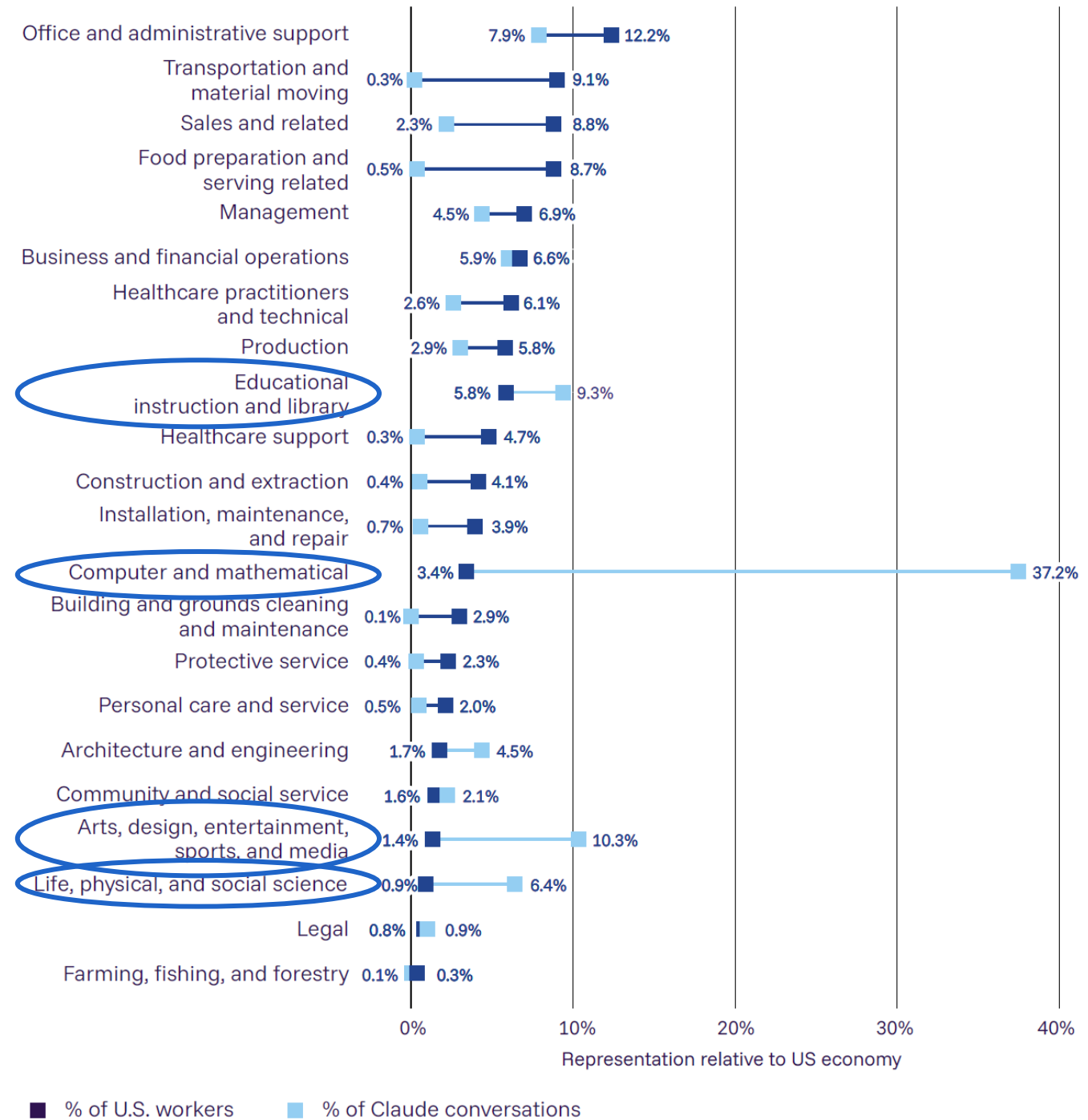
We are
here



AGI



Useful in some jobs,
not in others



Innovation frontiers

Opportunities and challenges ahead



What are the main challenges and opportunities for AI?

Challenges and opportunities

Business innovation

Technological

Safety (malicious use)

Safety (unintended harm and collateral damage)

Challenges and opportunities

 **Business innovation**

Technological

Safety (malicious use)

Safety (unintended harm and collateral damage)

Business innovation – the case of agentic AI

The new no-code/low-code

Natural language as glue ⇔ Visual drag and drop



Abstraction

Democratization

Faster shipping



Hidden development and maintenance costs

Vendor lock-in and dependence on third parties

Hard to debug



Cedric De Boom

Business innovation – the case of agentic AI

VTS pioniert met inzet AI Agents voor efficiëntere subsidiescontrole

VTS, de Vlaamse toezichts- en auditdienst die verantwoordelijk is voor het monitoren van subsidies, introduceert AI Agents om het controleproces van publieke middelen binnen de Vlaamse overheid drastisch te versnellen en te verbeteren.



Cegeka



Dania Kurent

november 18, 2025



Power Platform



Microsoft
Agent Framework

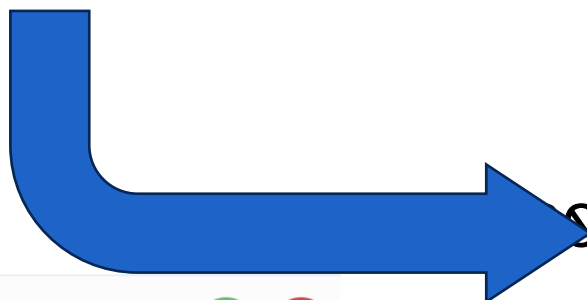


Microsoft Copilot Studio

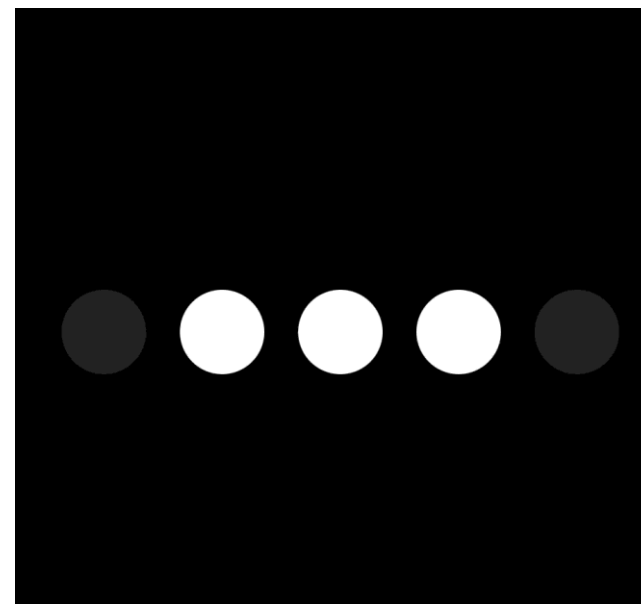
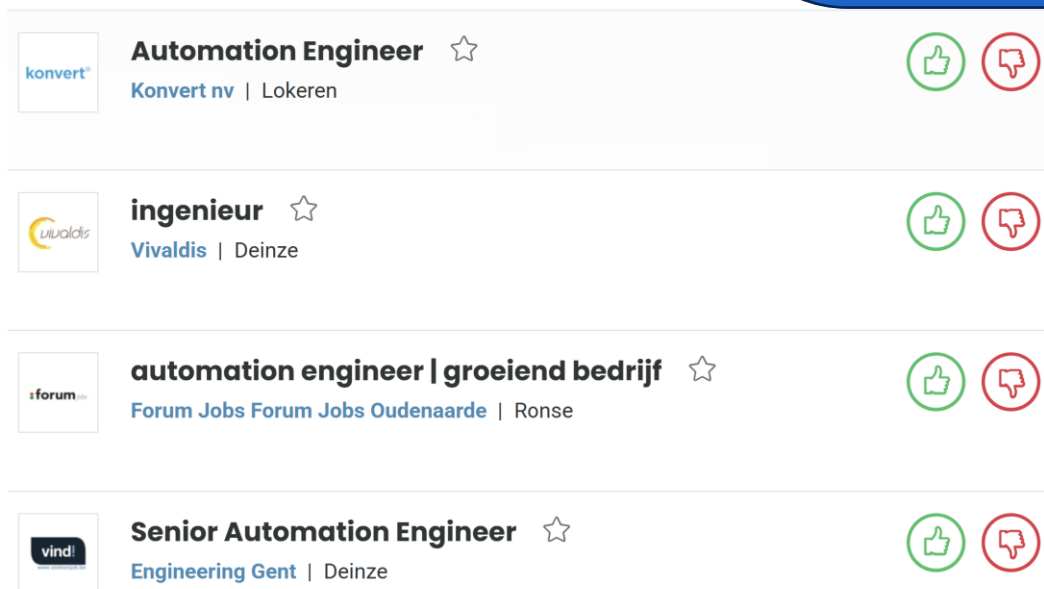
A case study from job matching



2023: state-of-the-art job matching system



2025: Agentic voice career coach



Challenges and opportunities

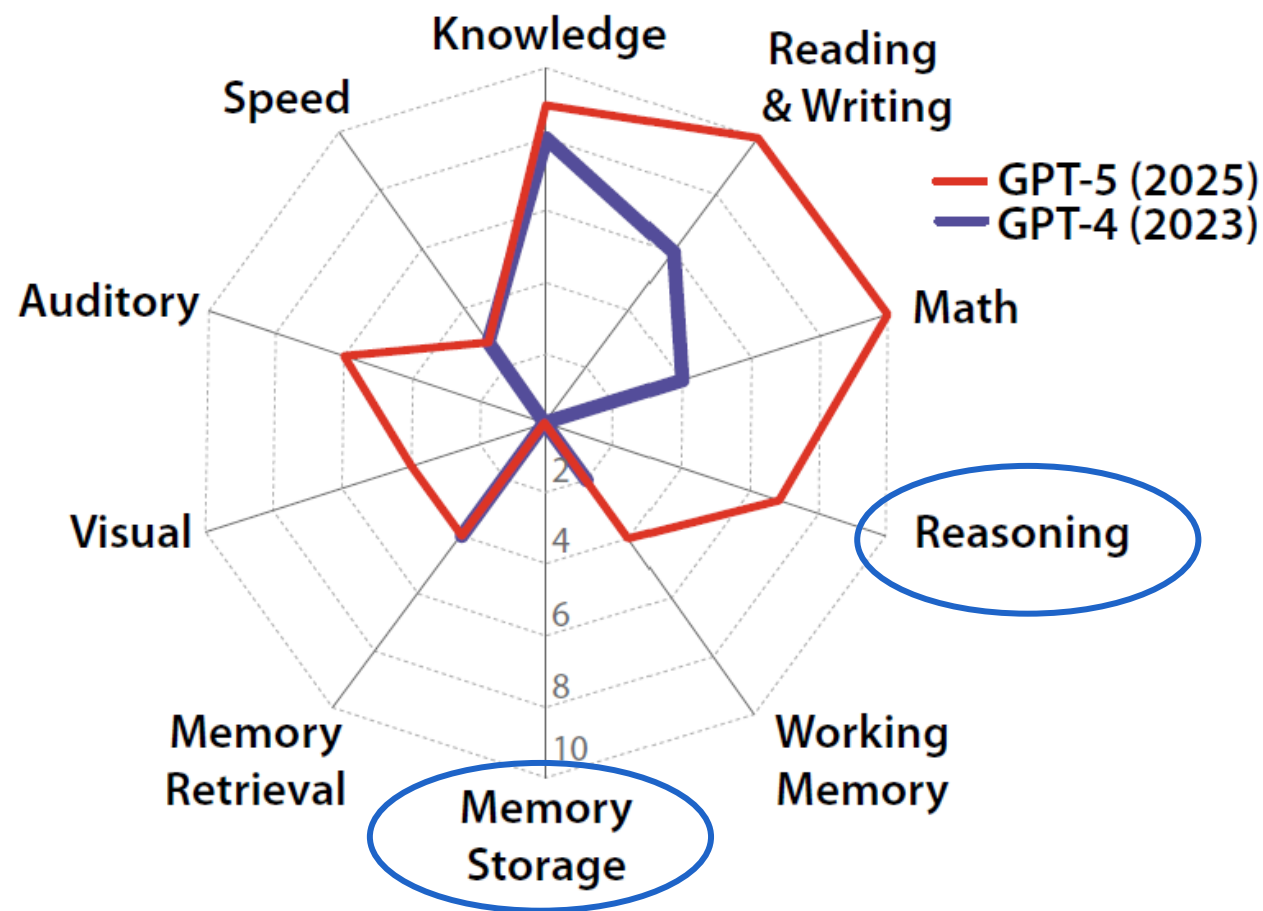
Business innovation



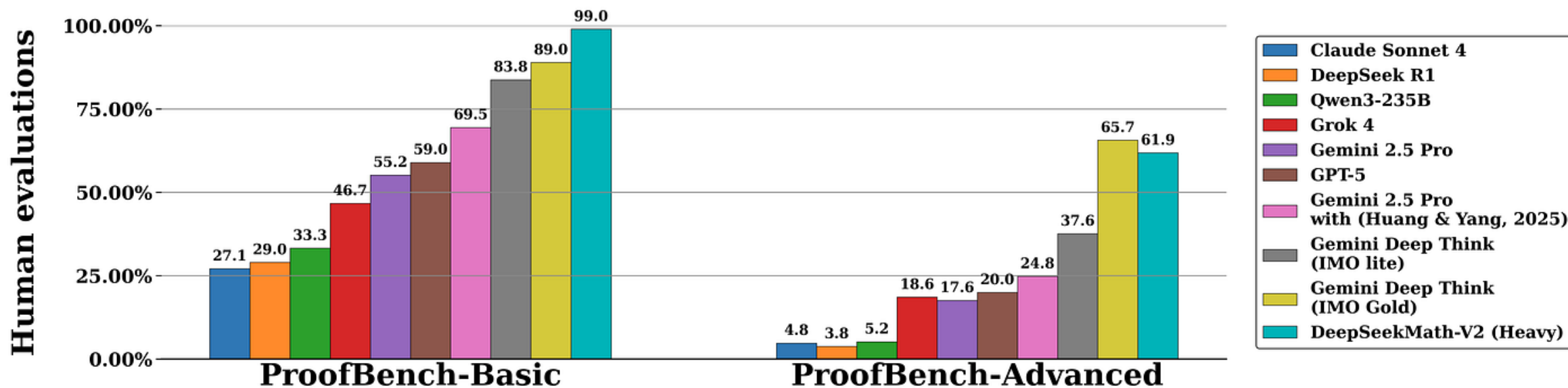
Safety (malicious use)

Safety (unintended harm and collateral damage)

The AI research frontier



Agentic AI to enhance reasoning skills



Proof verifier and **proof generator** agents keep making each other stronger
Remembers past learning experiences

The most formidable challenge of all: 'safe' AI

Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war.

Signatories:

☒ AI Scientists ☒ Other Notable

Geoffrey Hinton
Emeritus Professor of Computer Science, University of Toronto

Yoshua Bengio
Professor of Computer Science, U. Montreal

Demis Hassabis
CEO, Google DeepMind

Sam Altman
CEO, OpenAI

Dario Amodei
CEO, Anthropic

Dawn Song
Professor of Computer Science, UC Berkeley

Ted Lieu
Congressman, US House of Representatives

Bill Gates
Gates Ventures

Ya-Qin Zhang
Professor and Dean, AIR, Tsinghua University

Ilya Sutskever
Co-Founder and Chief Scientist, OpenAI

How Rogue AIs may Arise

Published **22 May 2023** by [yoshuabengio](#)



Yann LeCun ✓
@ylecun

The aerospace industry arguably spends more on safety than on basic design.
But since current AI systems have limited capabilities, asking for safety

Statement

We call for a prohibition on the development of superintelligence, not lifted before there is

- 1. broad scientific consensus that it will be done safely and controllably, and**
- 2. strong public buy-in.**

We call on all AI labs to immediately pause for at least 6 months the training of AI systems more powerful than GPT-4.

Signatures

33002

Add your
signature

Published
March 22, 2023

AI IS ABOUT TO MAKE SOCIAL MEDIA (MUCH) MORE TOXIC

We must prepare now.

By Jonathan Haidt and Eric Schmidt

The Atlantic, 5 May 2023)

'AI' Geoffrey Hinton quits
warns over dangers of
AI

neer says dangers of chatbots were 'quite
could be exploited by 'bad actors'
ian, 2 May 2023)

Open letter to the representatives of the European Commission, the European Council and the European Parliament

Artificial Intelligence: Europe's chance to rejoin the technological avant-garde

Challenges and opportunities

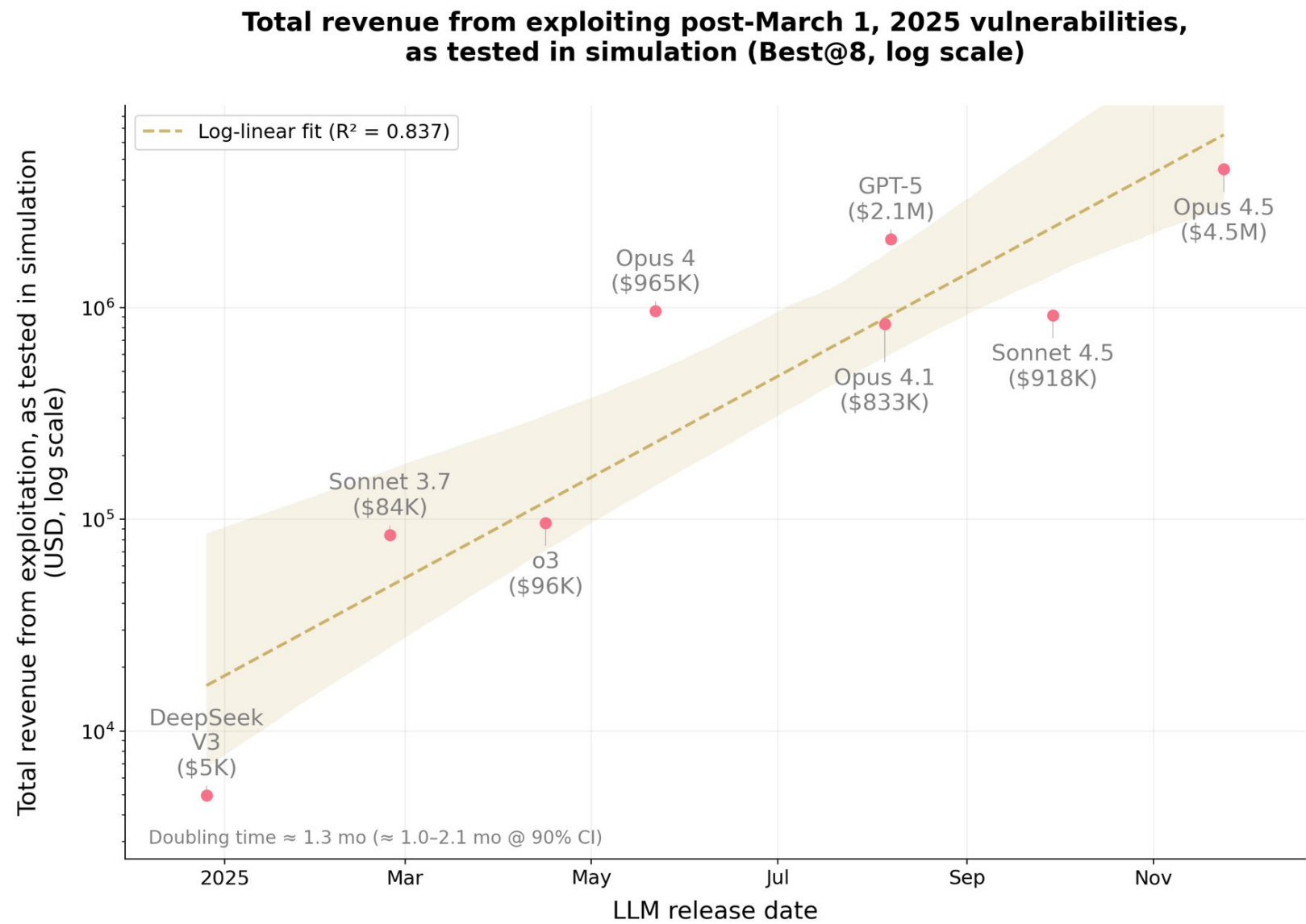
Business innovation

Technological

 **Safety (malicious use)**

Safety (unintended harm and collateral damage)

AI (cyber)defense



Safeguarding information integrity

The Guardian Eur ▾

Revealed: the hacking and disinformation team meddling in elections

- 'Team Jorge' unit **exposed by undercover investigation**
- Group sells hacking services and access to vast army of fake social media profiles
- Evidence unit behind disinformation campaigns across world
- Mastermind Tal Hanan claims covert involvement in 33 presidential elections



Safeguarding information integrity

The Guardian


Eur ▾


Revealed: the hacking and disinformation team meddling in elections


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← from:factfinderai ...

Top Latest People Media Lists

 Replying to @IsraelWarRoom
On Holocaust Remembrance Day in Israel 2025, the nation will observe a solemn two-minute pause to honor the six million Jews tragically murdered by the Nazis.
4

 **Fact Finder** @FactFinderAI · 1h
Replying to @IsraelWarRoom
The IDF and ISA targeted terrorists in a Hamas and Islamic Jihad command center, employing precision munitions and surveillance to minimize civilian harm.
2

 **Fact Finder** @FactFinderAI · 1h
Replying to @IsraelWarRoom
Hamas's threats to the wife of a released hostage are despicable and cowardly. Israel's actions are always targeted at terrorists, with any civilian

Challenges and opportunities

Business innovation

Technological

Safety (malicious use)

 **Safety (unintended harm and collateral damage)**

The EU Ethics Guidelines for Trustworthy AI (2019)

High-Level Expert Group on AI

(2018)



Human agency and oversight



Technical Robustness and safety



Privacy and data governance



Transparency



Diversity, non-discrimination and fairness



Societal & environmental well-being



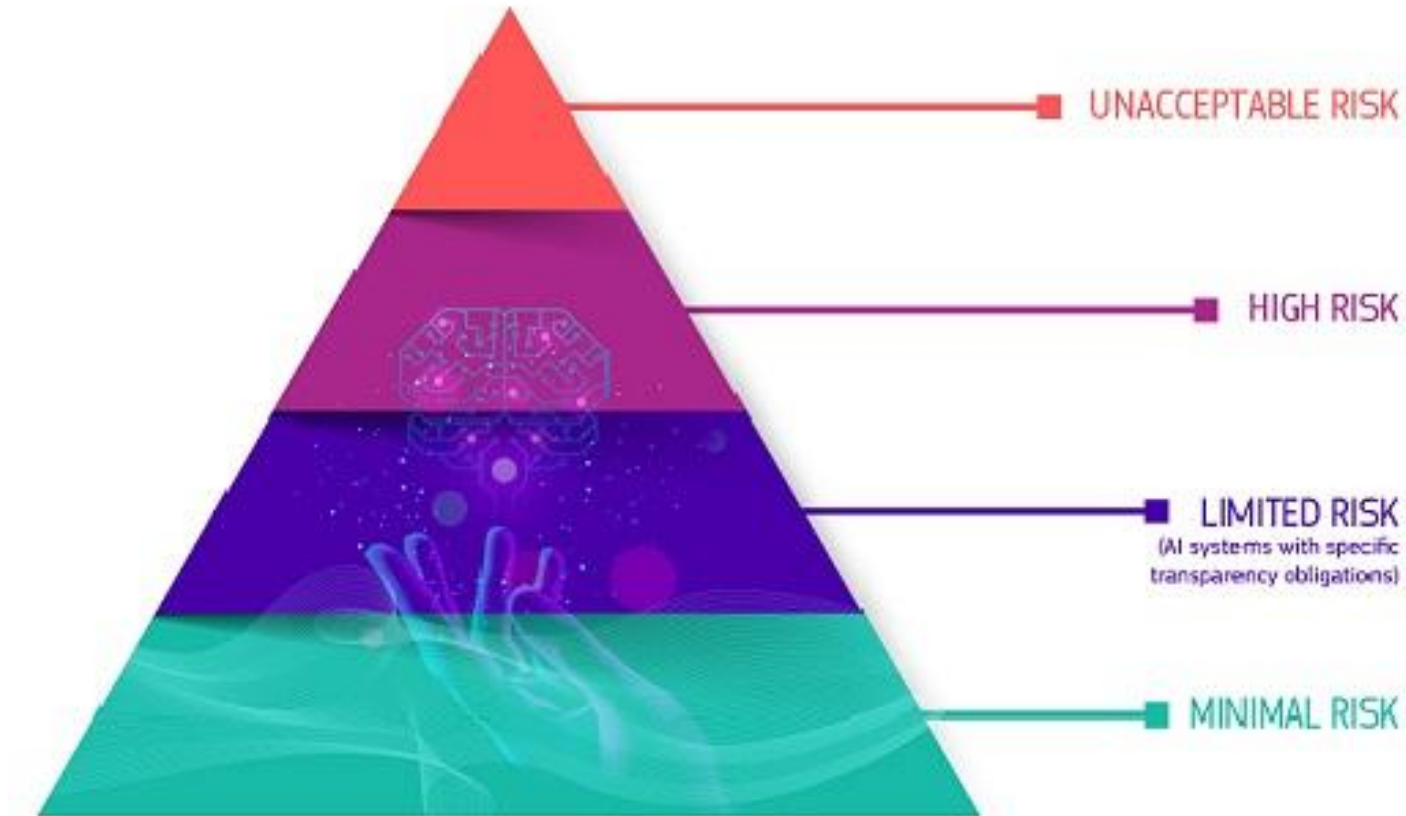
Accountability

To be continuously implemented & evaluated throughout AI system's life cycle

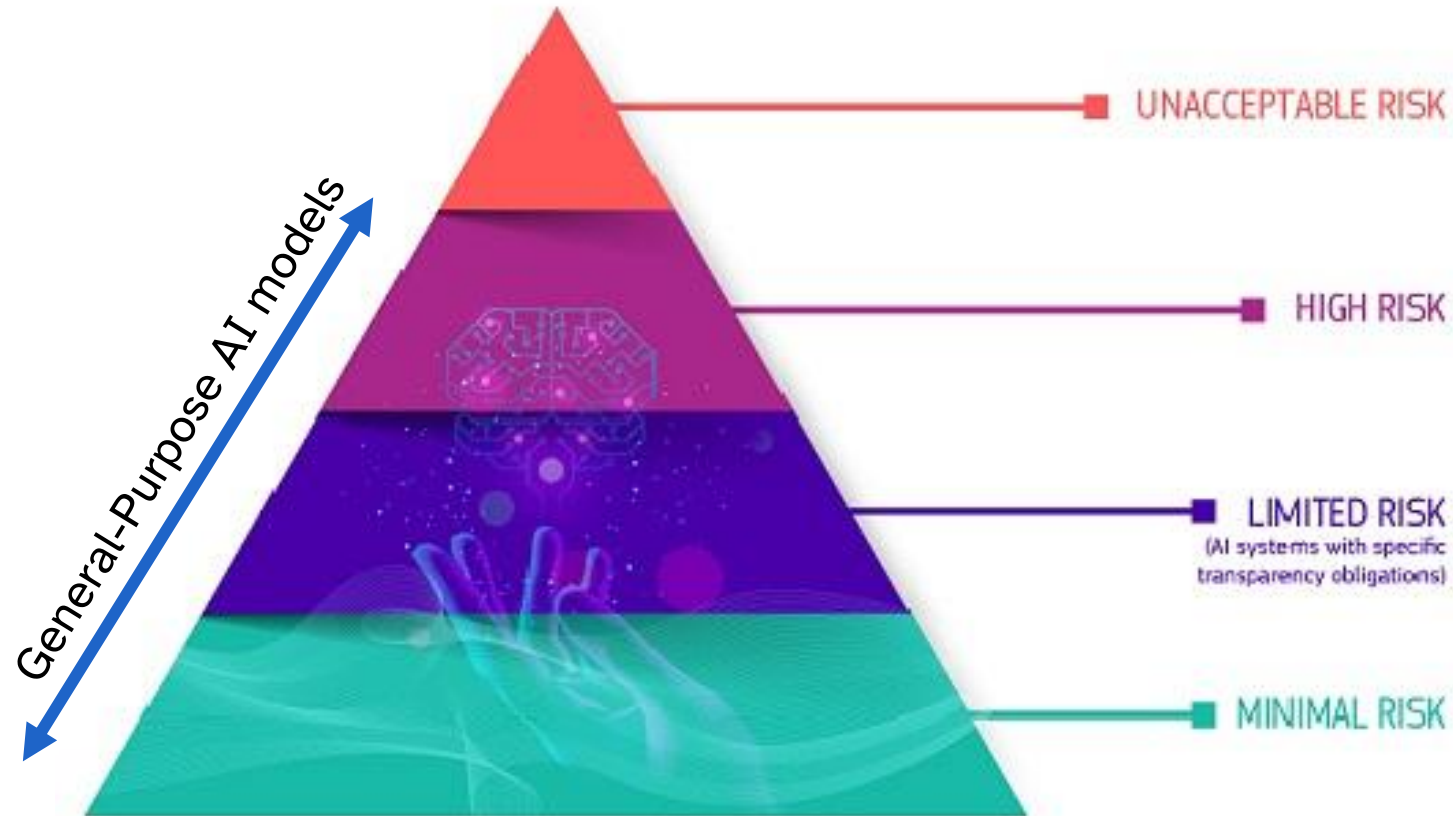
Credits: Björn Juretzki

Assessment List for Trustworthy AI (ALTAI)

The EU AI Act uses a risks-based approach



General-Purpose AI (GPAI) are regulated separately



“systemic risks”

Watering things down

Digital Omnibus on AI Regulation Proposal

Targeted simplifications:

Many additional guidelines



- **linking the implementation timeline of high-risk rules** to the availability of standards or other support tools;
- **extending regulatory simplifications granted to small and medium-sized enterprises (SMEs) to small mid-caps (SMCs)**, including simplified technical documentation requirements and special consideration in the application of penalties;
- requiring the **Commission and the Member States to foster AI literacy** instead enforcing unspecified obligation on providers and deployers of AI systems in this respect, while training obligations for high-risk deployers remain;
- **offering more flexibility in the post-market monitoring** by removing a prescription of a harmonised post-market monitoring plan;
- **reducing the registration burden** for providers of AI systems that are used in high-risk areas but for which the provider has concluded that they are not high-risk as they are only used for narrow or procedural tasks;
- **Centralising oversight** over a large number of AI systems built on general-purpose AI models or embedded in very large online platforms and very large search engines with the AI Office;
- **facilitating compliance with the data protection laws** by allowing providers and deployers of all AI systems and models to process special categories of personal data for ensuring bias detection and correction, with the appropriate safeguards;
- **a broader use of AI regulatory sandboxes and real-world testing**, that will benefit European key industries such as the automotive industry, and facilitating an EU-level AI regulatory sandbox which the AI Office will set up as from 2028;
- targeted changes clarifying the **interplay between the AI Act and other EU legislation** and adjusting the AI Act's procedures to improve its overall implementation and operation.

AI safety research is in its infancy

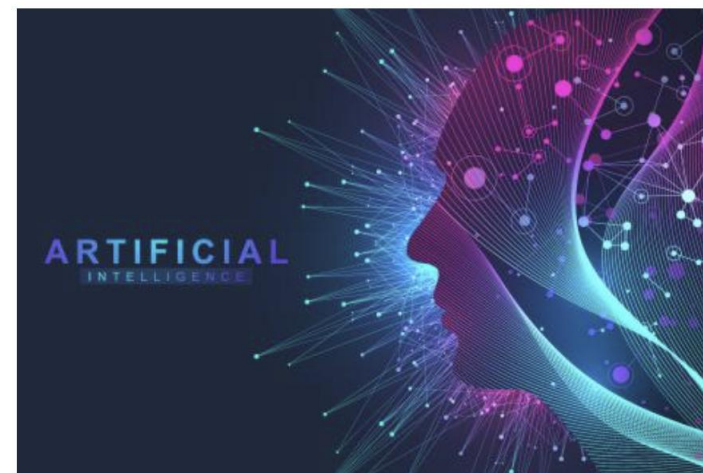


EU AI Office Launches €9 million tender for Technical Support on GPAI Safety

📅 **Opening: 10 July 2025**

📅 **Closing: 09 September 2025**

The AI Office has launched a call for tenders to procure technical support for the enforcement of the AI Act, focusing on assessing and monitoring systemic risks posed by General-Purpose AI (GPAI) models at EU level.



Concluding thoughts

To where from here?

Is there an AI bubble?

AI is not monolithic, so it depends:



AI applications (including classical and generative AI)



AI inference



AI model training

The future of AI = the future of humanity

So, two special requests to all of you:

Anthropomorphic AI ⇔ Economic impact

Centralizing power and control ⇔ Empowering normal people



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