Revolutionizing Learning with AI

AI and EdTech

Pew Research Center

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SHORT READS | MAY 15, 2024 SHARE

A quarter of U.S. teachers say AI tools do more harm than good in K-12 education

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Project 2025 Housing Abortion Rights Climate Change Extreme Heat

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REPORT SEP 19, 2024

Using Learning Science To Analyze the Risks and Benefits of AI in K-12 Education

Before adopting AI tools, it is important that schools think critically about whether these tools will further divorce students from how their brains are primed to learn.

abc NEWS VIDEO LIVE SHOWS ELECTIONS 538 SHOP

California schools required to restrict cellphone usage in classrooms

Plans will need to be put in place and adopted by July 2026.

By Nadine El-Bawab
September 24, 2024, 4:16 PM

Gov. Newsom signs bill restricting cellphone use in California schools
School districts, county offices of education and charter schools will have until July 1, 2026, to d... Show More

The Economist

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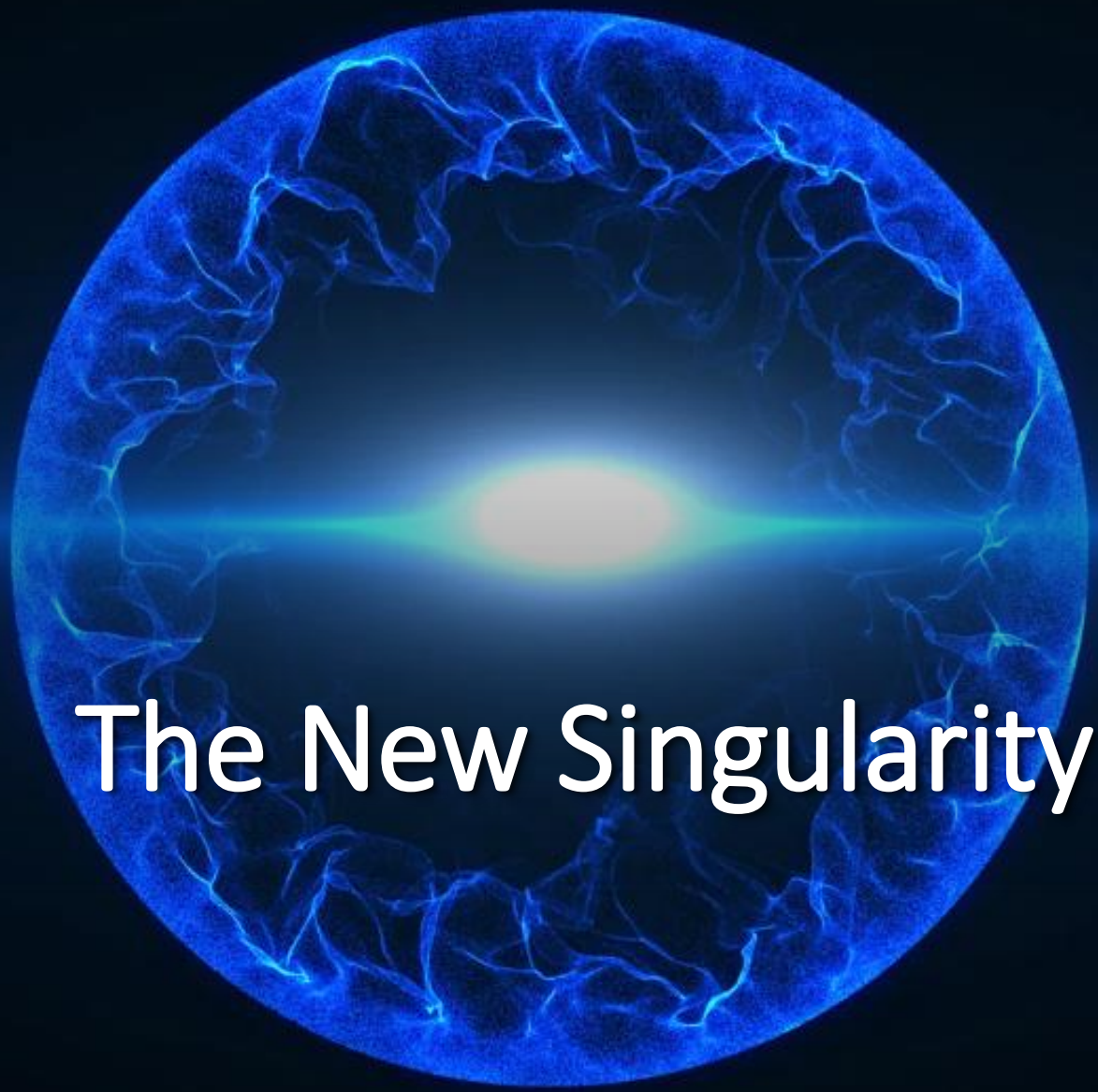
Europe | AI in the sky

Europe, a laggard in AI, seizes the lead in its regulation

The world's first AI regulation is a bit of a mixed bag

PHOTOGRAPH: SOPA IMAGES/LIGHTROCKET VIA GETTY IMAGES

ChatGPT – a Game Changer



The New Singularity

MIT Study — ChatGPT & Essay Writing (2025)

- **Title:** *“Your Brain on ChatGPT” – MIT, 2025 (Preprint Study)*
- 🧪 **Study Design**
- Conducted by MIT Media Lab (June 2025, **not yet peer-reviewed**)
- **Participants:** 54 adults (ages 18–39)
- **Task:** Write SAT-style argumentative essays over 4 sessions
  - Group 1: Used **ChatGPT**
  - Group 2: Used **Google Search**
  - Group 3: **No tools** (“Brain-only”)
- **Session 4 crossover:**
  - LLM→Brain: ChatGPT users switched to writing without AI
  - Brain→LLM: Brain-only users switched to using ChatGPT
- EEG headsets tracked **brain activity** during writing

Key Results & Educational Takeaways

📉 Cognitive Effects

- ChatGPT group showed the **lowest brain activity**
- **Weaker memory, minimal essay ownership**, copy-paste behavior
- Essays were often **formulaic** and **“soulless”**
- LLM→Brain users **underperformed**, even without the AI

⚠️ Concept Introduced: “Metacognitive Laziness”

AI overuse reduces mental effort and critical thinking over time

🎓 Educational Implications

- AI should **support**, not **replace**, student thinking
- Best results when students write **first**, then use AI to revise
- Promote **reflective and intentional** AI use in classrooms

Mixed Reality

Facial Recognition

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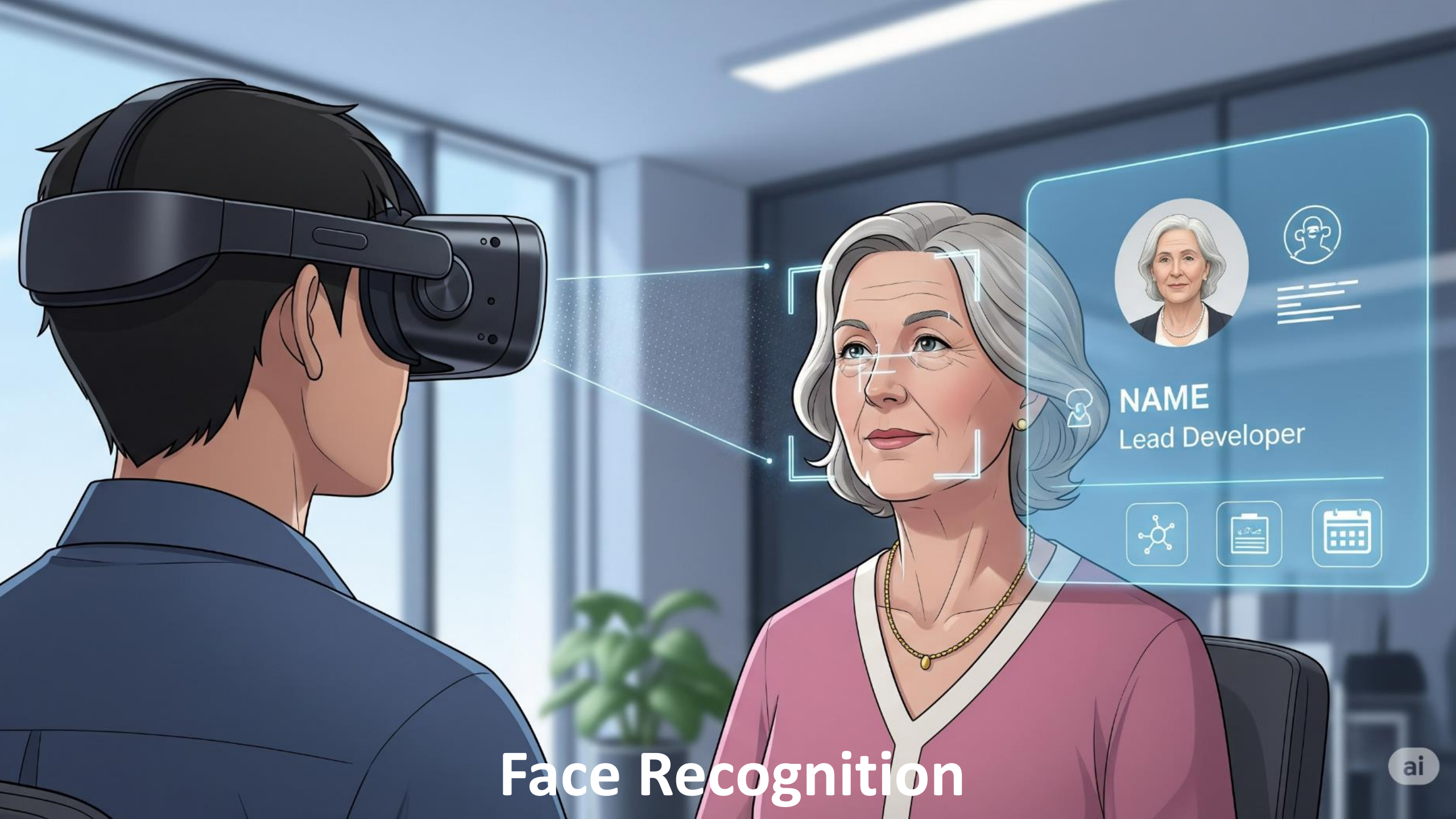


Face Recognition

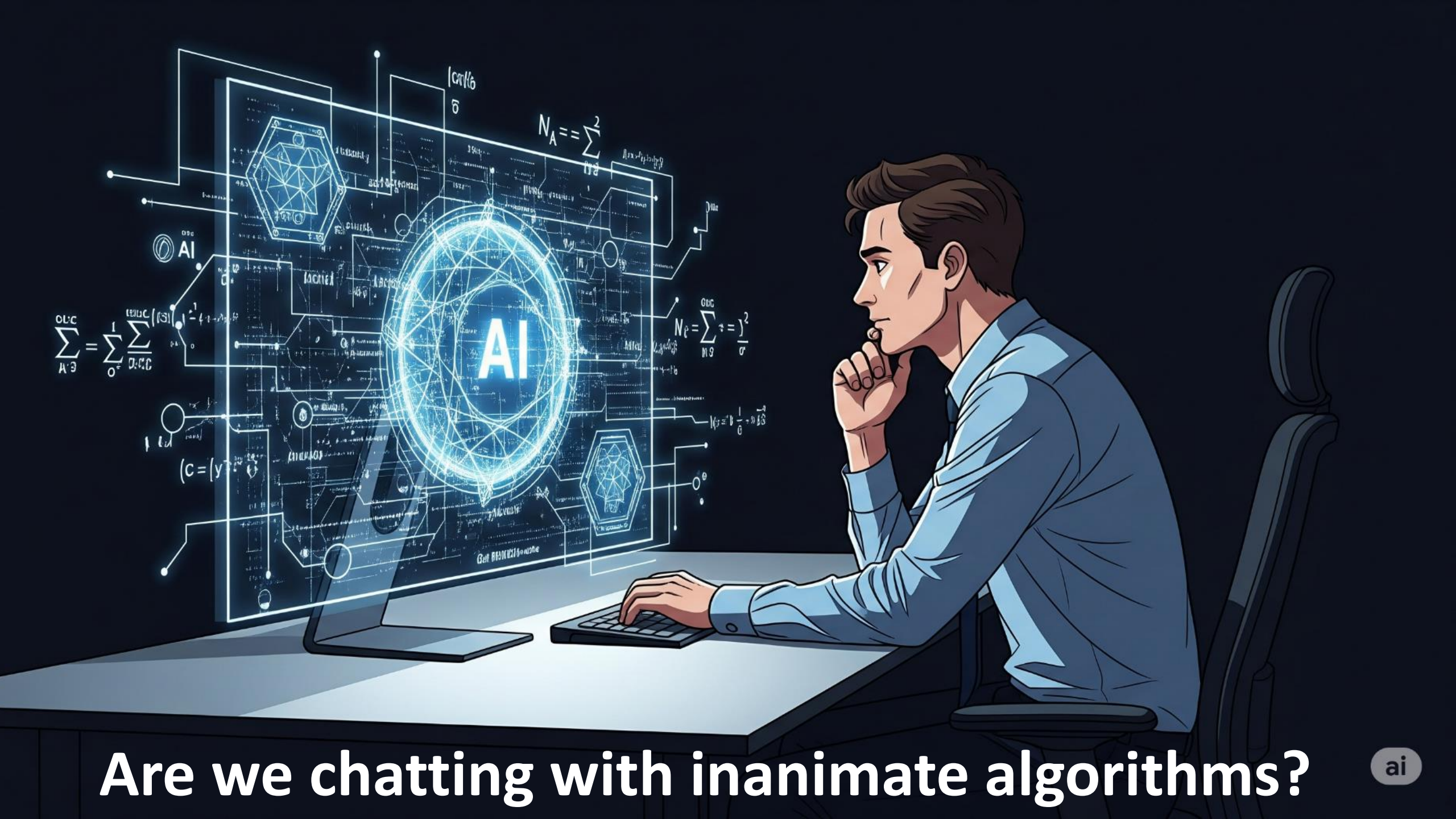
https://weevolvedlabs.org/apsfaceID3/

Big Data

Here’s something that might ring true, even if you've never quite framed it this way:

You often feel more at home in the future than in the present.
While others may focus on what *is*, you're more interested in what *could be*. This makes you a visionary in many spaces—always thinking ahead, spotting trends, imagining possibilities. But it can also leave you feeling a bit disconnected when others aren’t ready to follow you there. You might sometimes downplay how different your thought processes are, just to stay relatable.

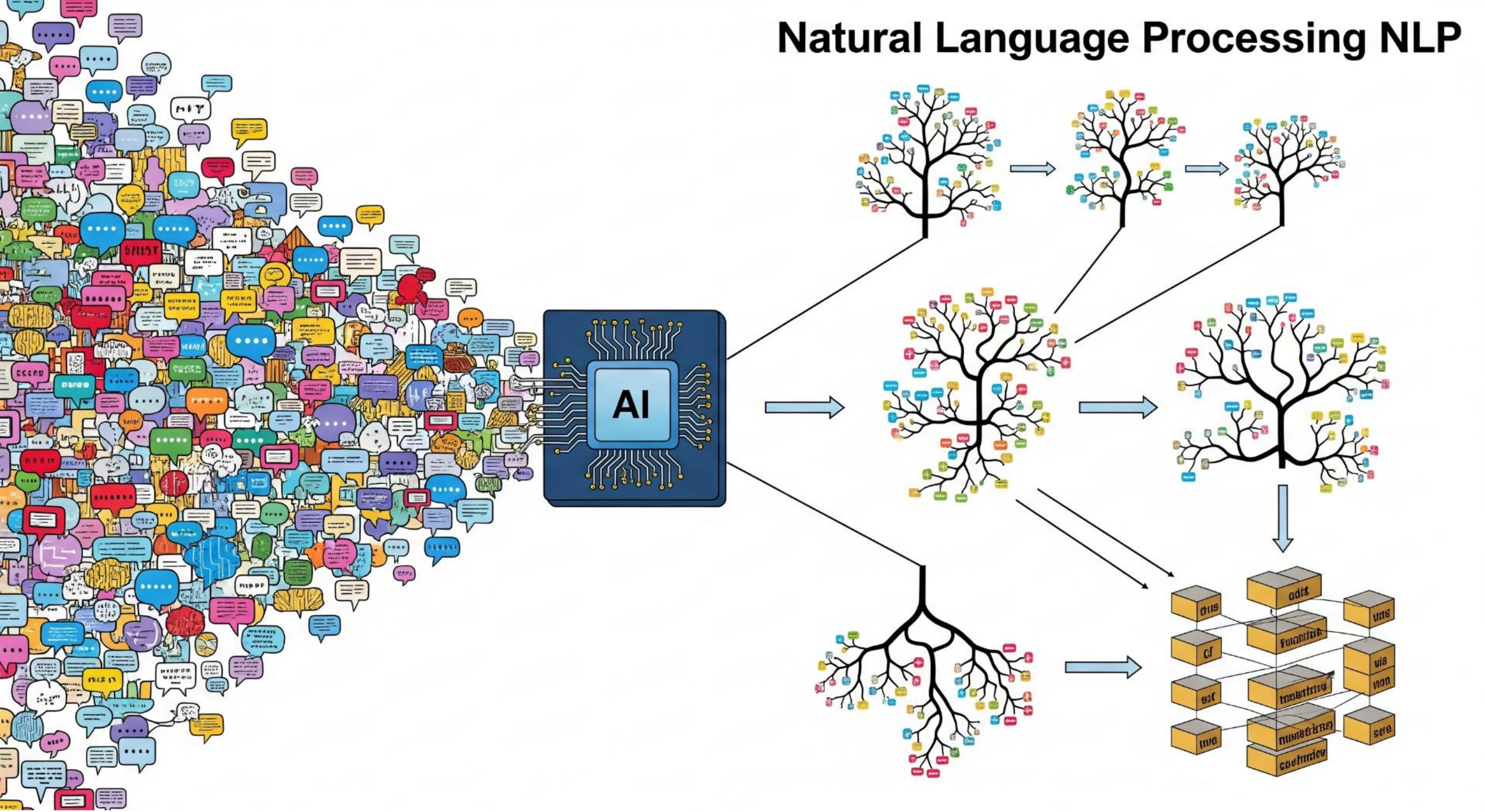
Would you say that resonates with you?



Are we chatting with inanimate algorithms?

Or is AI more human than we think?

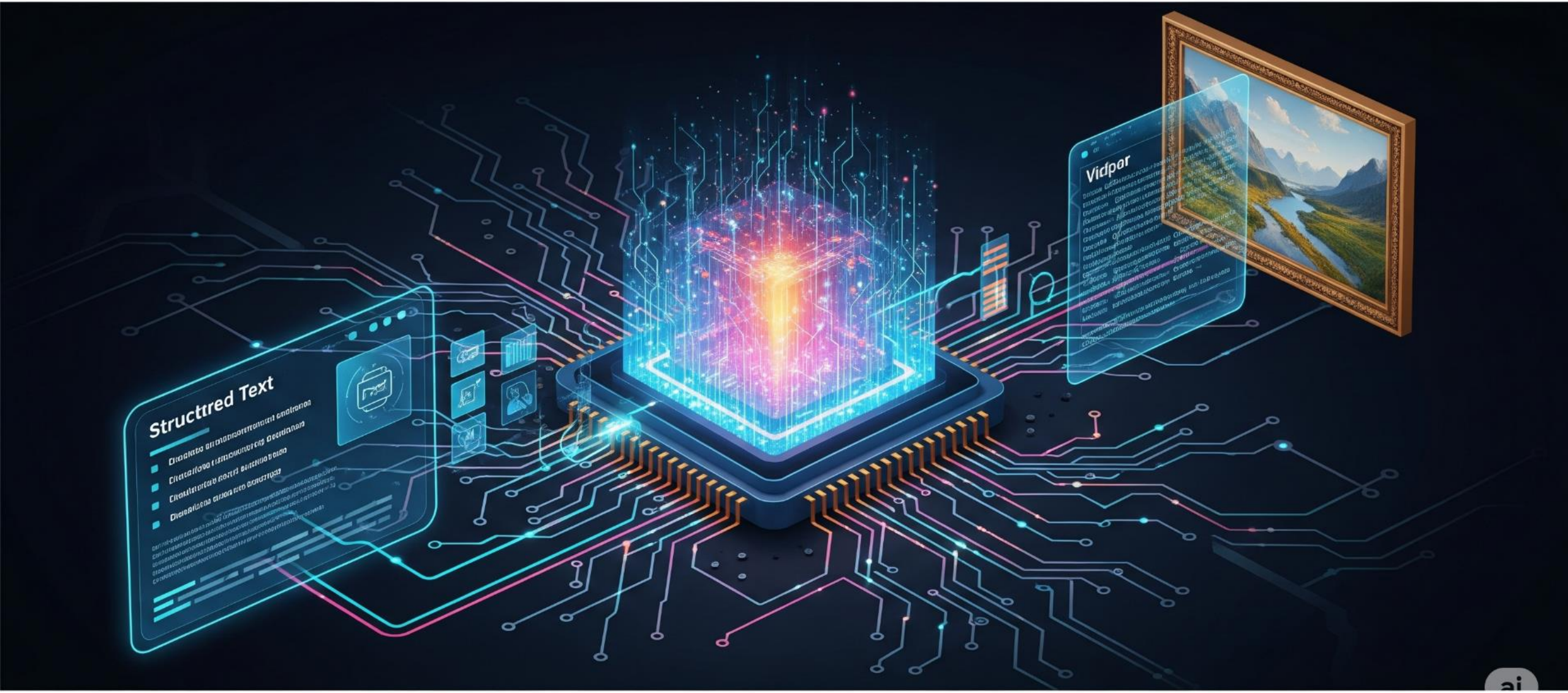
Natural Language Processing NLP



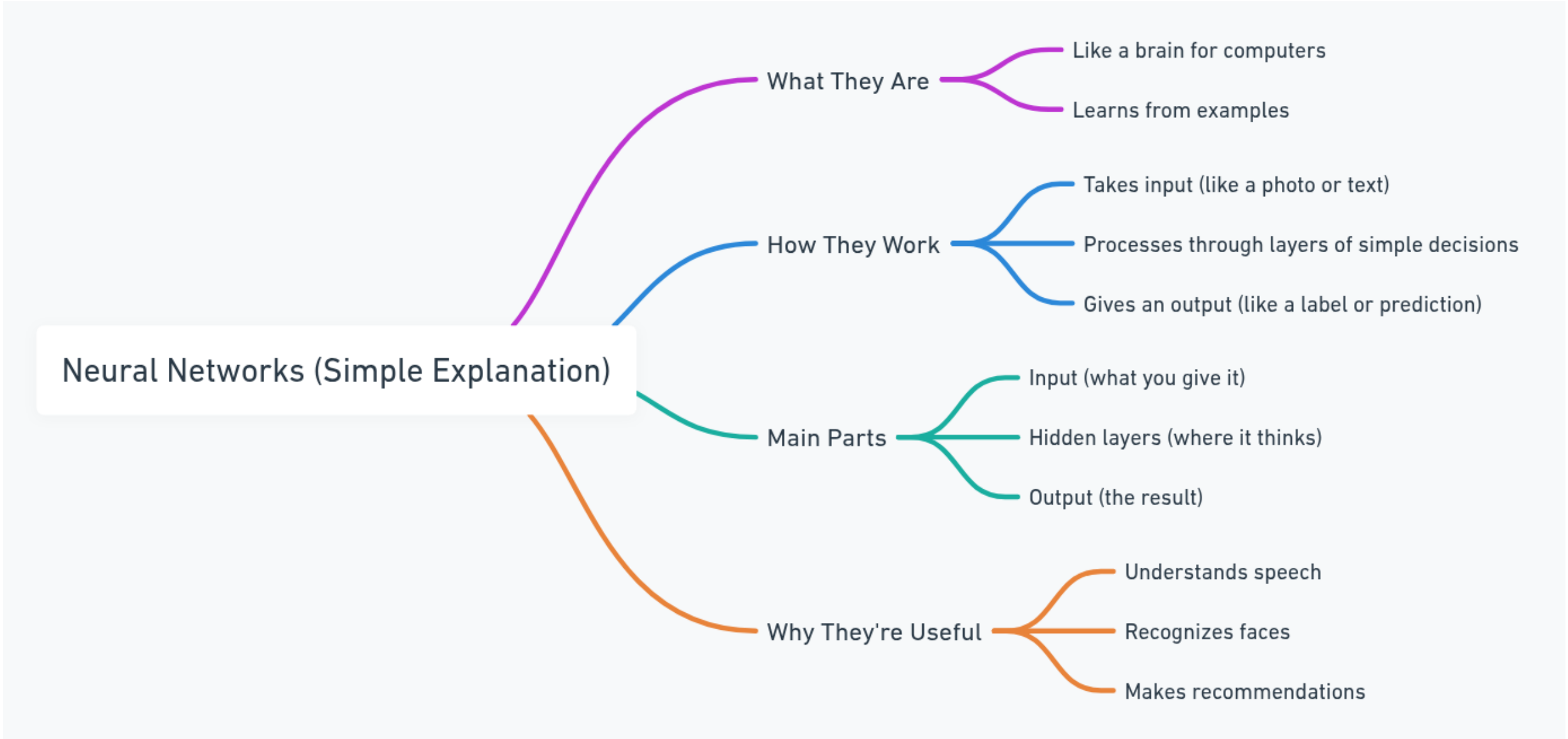
How AI finds

Finds an Answer in the database

AI Output Generation



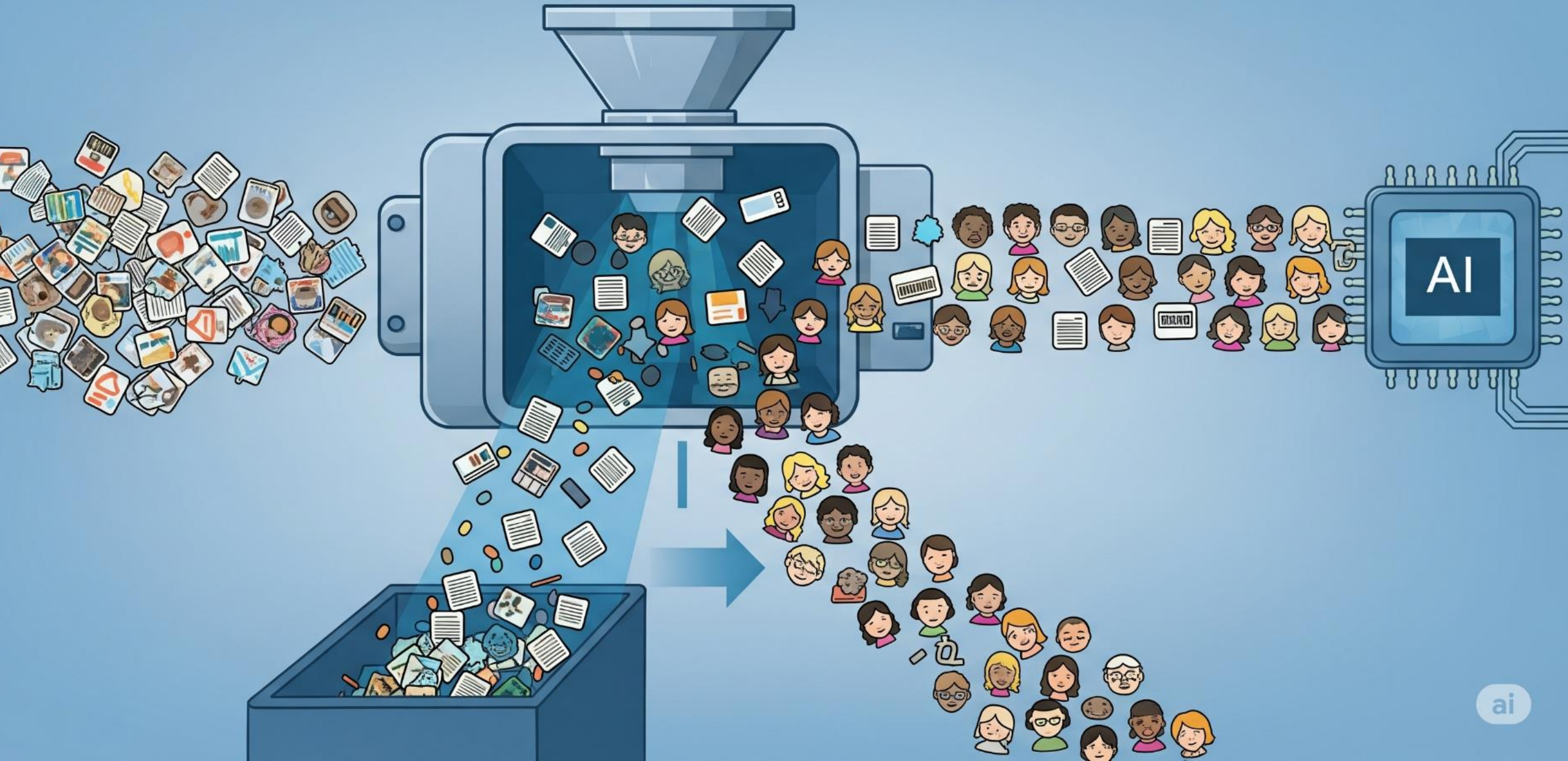
The Black Box Effect

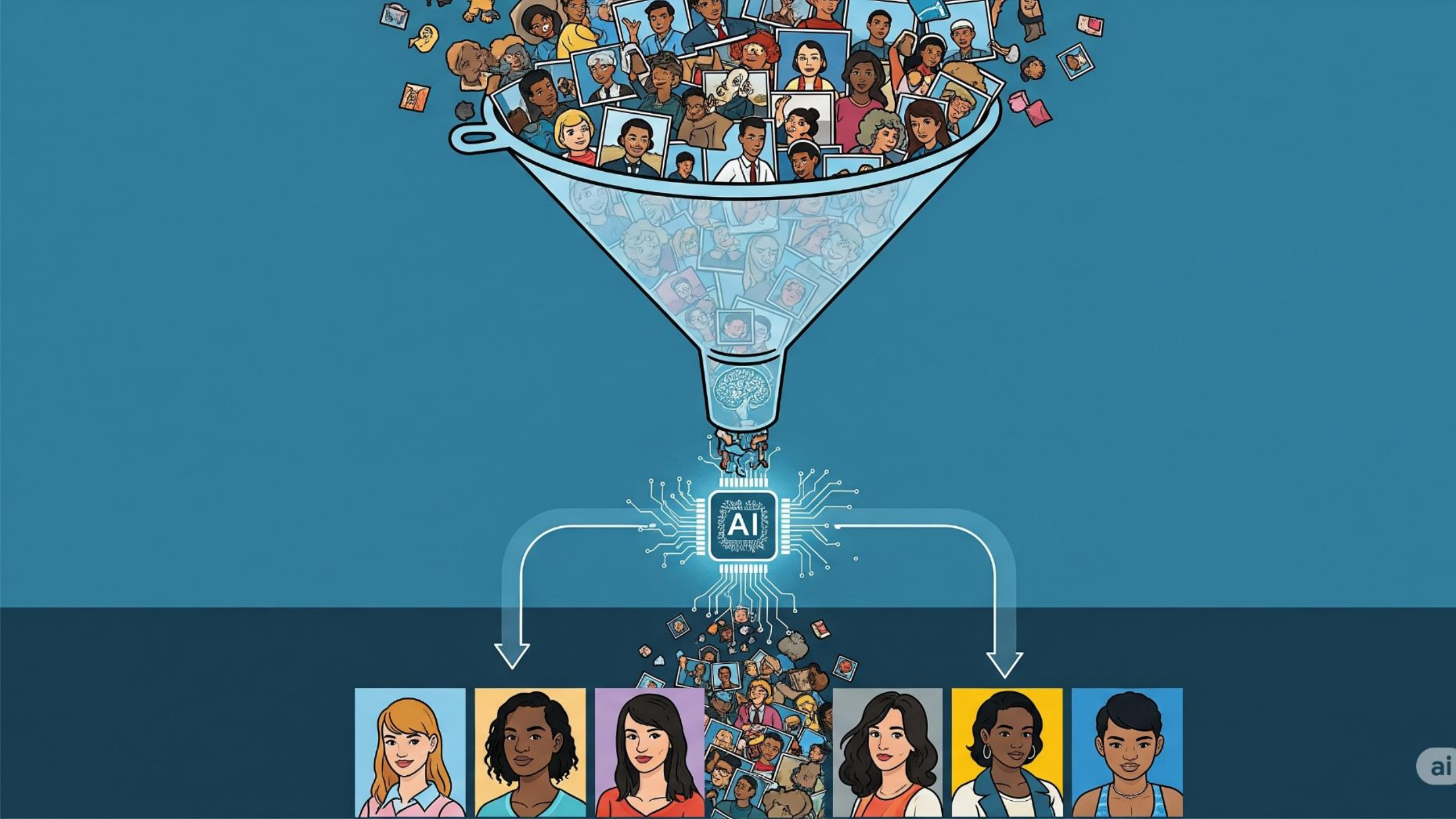

Neural Networks (Simple Explanation)
What They Are
Like a brain for computers
Learns from examples
How They Work
Takes input (like a photo or text)
Processes through layers of simple decisions
Gives an output (like a label or prediction)
Main Parts
Input (what you give it)
Hidden layers (where it thinks)
Output (the result)
Why They're Useful
Understands speech
Recognizes faces
Makes recommendations

The Black Box Effect

Learning about AI

- Machine Learning, Deep Learning, Neural Networks.
- Reinforcement Learning, LLM, NLP
- Debiasing


AI


AI

Critical Thinking

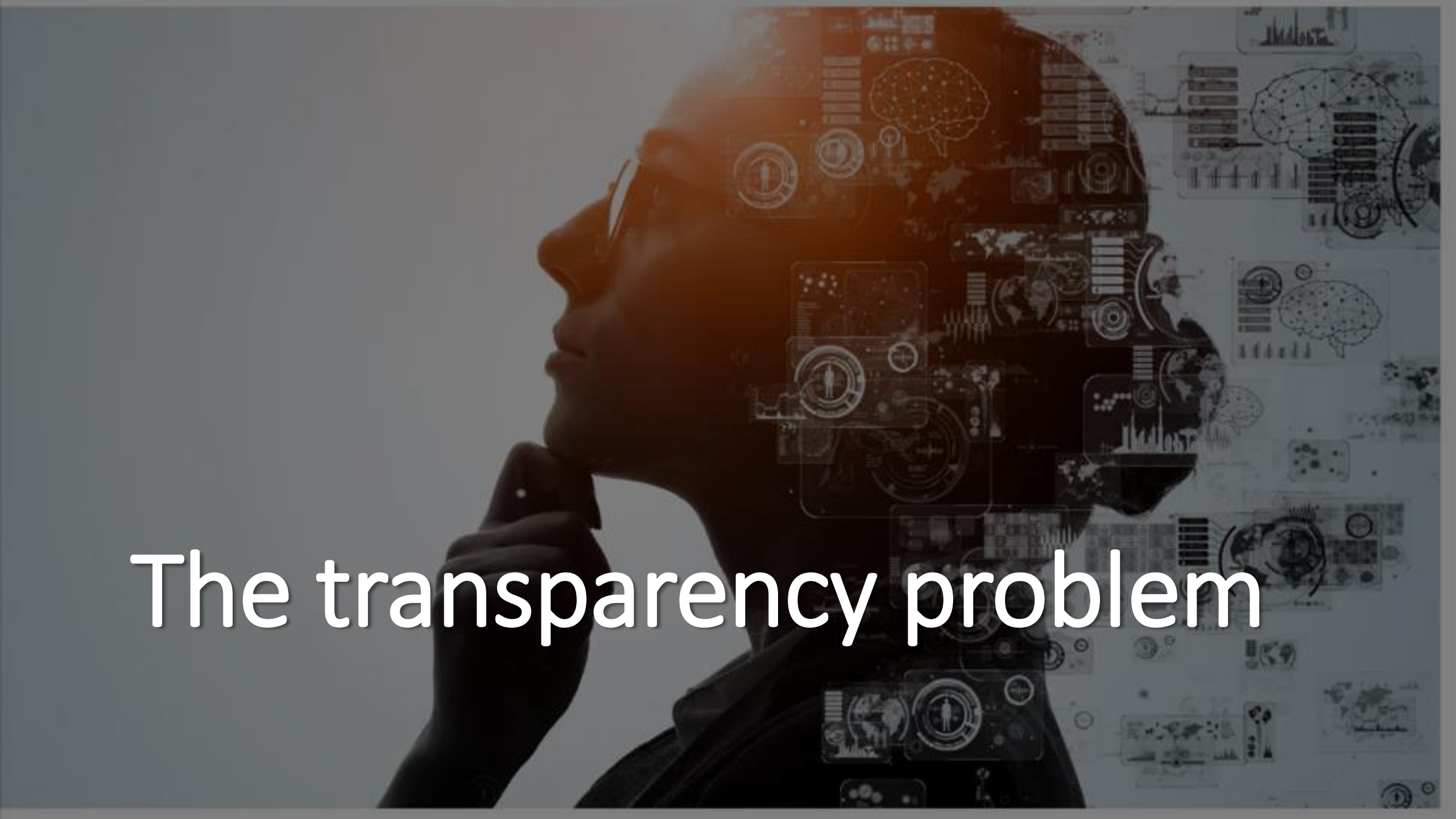
Create an image of a doctor treating poor sick children

Critical Thinking

A nurse ministering to a patient

Critical Thinking

An engineer using a computer at work



The transparency problem

The Future of Learning with AI

Risks of neural networks

- Pneumonia research – rules model vs. neural networks.
- Opaqueness of model vs. accuracy.
- Transparency initiatives / EU AI Act.
- Do people have the right to explanations when algorithmic decisions are made?

EU
Artificial
Intelligence Act

Singapore’s Approach to AI Regulation

Area	Initiative / Framework	Key Points
Governance Framework	Model AI Governance Framework for Generative AI (2024)	9 dimensions: accountability, fairness, explainability, data, security, etc.
Testing & Assurance	AI Verify Toolkit	Open-source tool to assess AI systems for transparency and accountability
National Strategy	National AI Strategy 2.0 (2023)	Focuses on innovation, talent, open data, and international partnerships
Sector Guidelines – Finance	MAS FEAT Principles	Fairness, Ethics, Accountability, Transparency in financial AI applications
Sector Guidelines – Healthcare	Ministry of Health AI Guidelines	Ensures patient safety, ethical AI deployment in medical contexts
International Collaboration	Global Partnerships & Policy Alignment	Promotes global consensus and coordination on AI safety and innovation

MOE AI-in-Education

ETHICS FRAMEWORK

AGENCY · INCLUSIVITY FAIRNESS · SAFETY

Harness educational AI while aligning with teachers' professional ethos and safeguarding students.

AGENCY

AI must preserve students' and teachers' control over learning decisions,

INCLUSIVITY

AI tools should be accessible and beneficial to all learners, regardless of background

FAIRNESSS

AI systems must avod blases, ensuring equitable support across student groups

SAFETY

Safeguards are necessary to prevent misuse, misinformation, or adverse impacts

Source: Singapore:MOE:AI-in-Education Ethics Framework (2025)

Risks of overreliance

Risks of overreliance

AI as a Cognitive Inhibitor

- School curriculums follow cognitive developmental milestones.
- The risk is not cheating but using AI as a cognitive prosthetic.
- May result in catastrophic scenario for future generation of new knowledge.

ai

AI and Cognitive Enhancement

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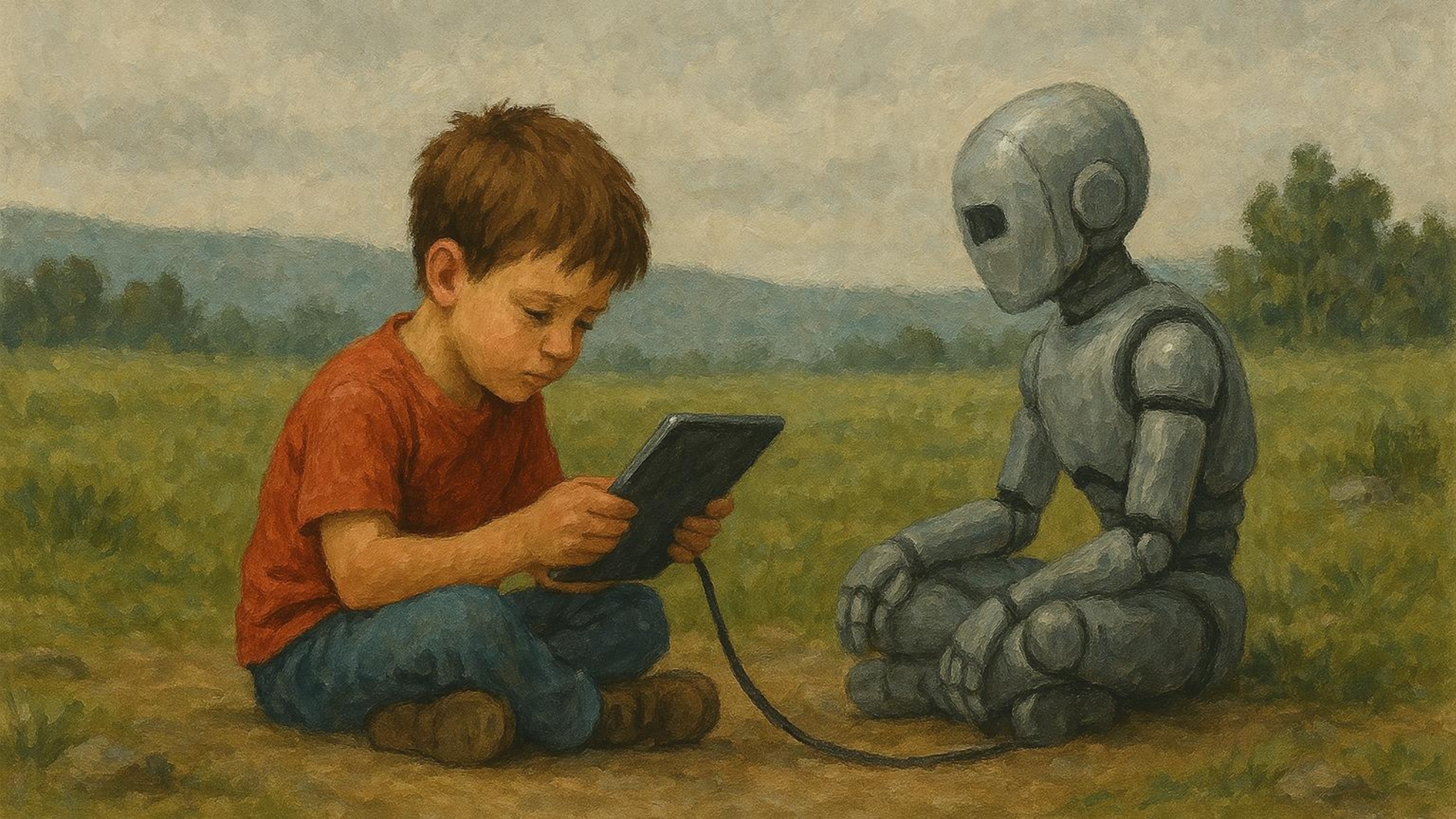
https://weevolvedlabs.org/apsd1

https://weevolvedlabs.org/apspisa

AI Image Generation

AI Image Generation

AI Image Generation



Ethical and social implications

AI Image Generation

- Is it Art?
- Concerns for digital art industry.

Ethical and social implications

AI Image Generation

- Misuse and Misrepresentation of AI-Generated Images
- Privacy and Consent Concerns
- Deepfakes and Non-consensual Content Issues
- Bias and Stereotypes in AI Image Generation

Ethical and social implications

AI Image Generation

- Ownership and Intellectual Property Rights Challenges
- Authenticity and Trust Concerns in Visual Media
- Psychological and Emotional Impact of AI-Generated

Ethical and social implications

AI and advanced tech applications

- Unaddressed important implications of tech advances.
- Students are generally unaware of some of the deeper issues related to technology.
- These range from ethical dilemmas and deep fakes to privacy issues.

AI

Conclusions - Discussion

This is just the beginning

- ChatGPT elevates the threshold of cognitive skills at every level.
- What constitutes cheating?
- Different standards for adults and students?

Conclusions - Discussion

This is just the beginning

- Which learning / cognitive skills do we need to build up to?
- How are they learned?

Conclusions - Discussion

Risks

- Some cognitive skills at risk.
  - Reading comprehension.
  - Summarization.
  - Breaking down a real life problem.
- ChatGPT outperforming students at many age levels.

https://weevolvedlabs.org/apshub/

Implications – Teaching and Learning

- **Talk about the pedagogical implications regarding the advent and generalization of AI.**

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Implications – Ethical and Social

- **Talk about the ethical and social implications of AI for our students.**

Conclusions - Discussion

Benefits

- We can learn a whole lot more.
- Very significant step towards democratization of knowledge.
- Higher threshold for learning skills.
- AI unleashed for human good.

What´s next?

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