Cognitive Extension with AI

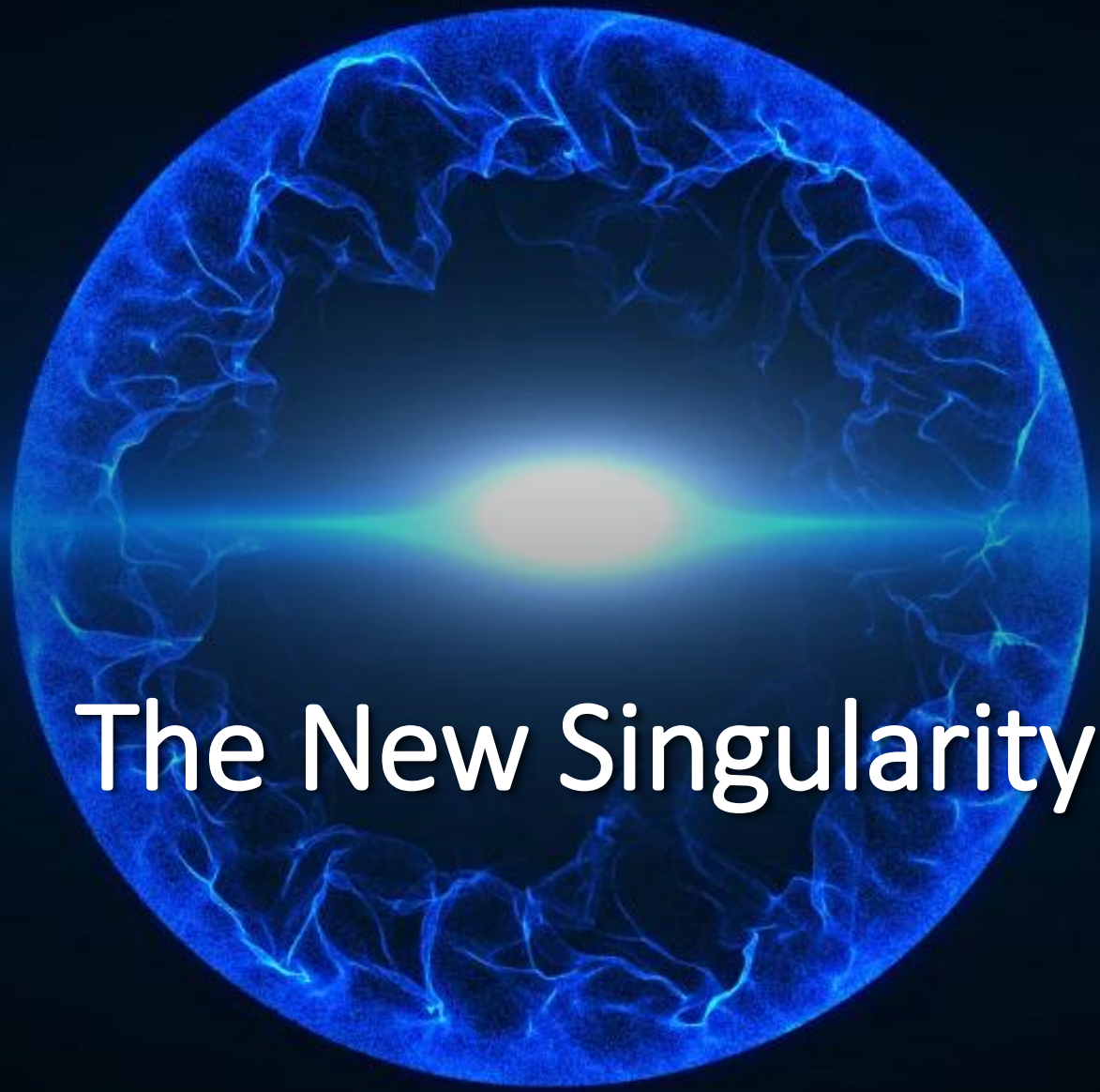
PRINCIPALS

ACADEMY

Our roadmap for today

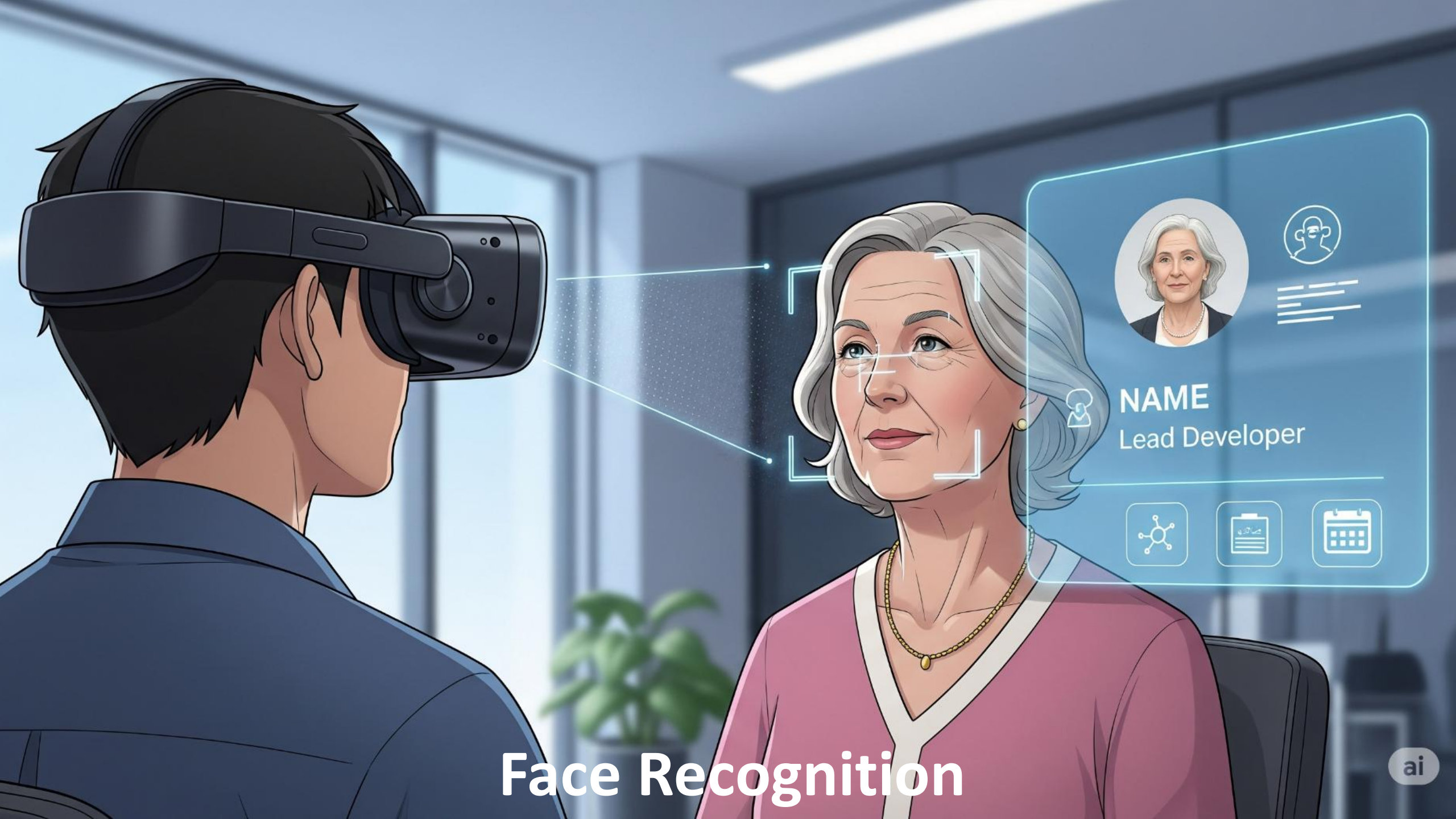
- GenAI Intro
- State of the Art AI today
- Singapore AI Ecosystem
- The concept of cognitive extension
- Developing cognitive extension apps
- Cognition roadmap
- Conclusions - discussions

ChatGPT – a Game Changer



The New Singularity

Mixed Reality



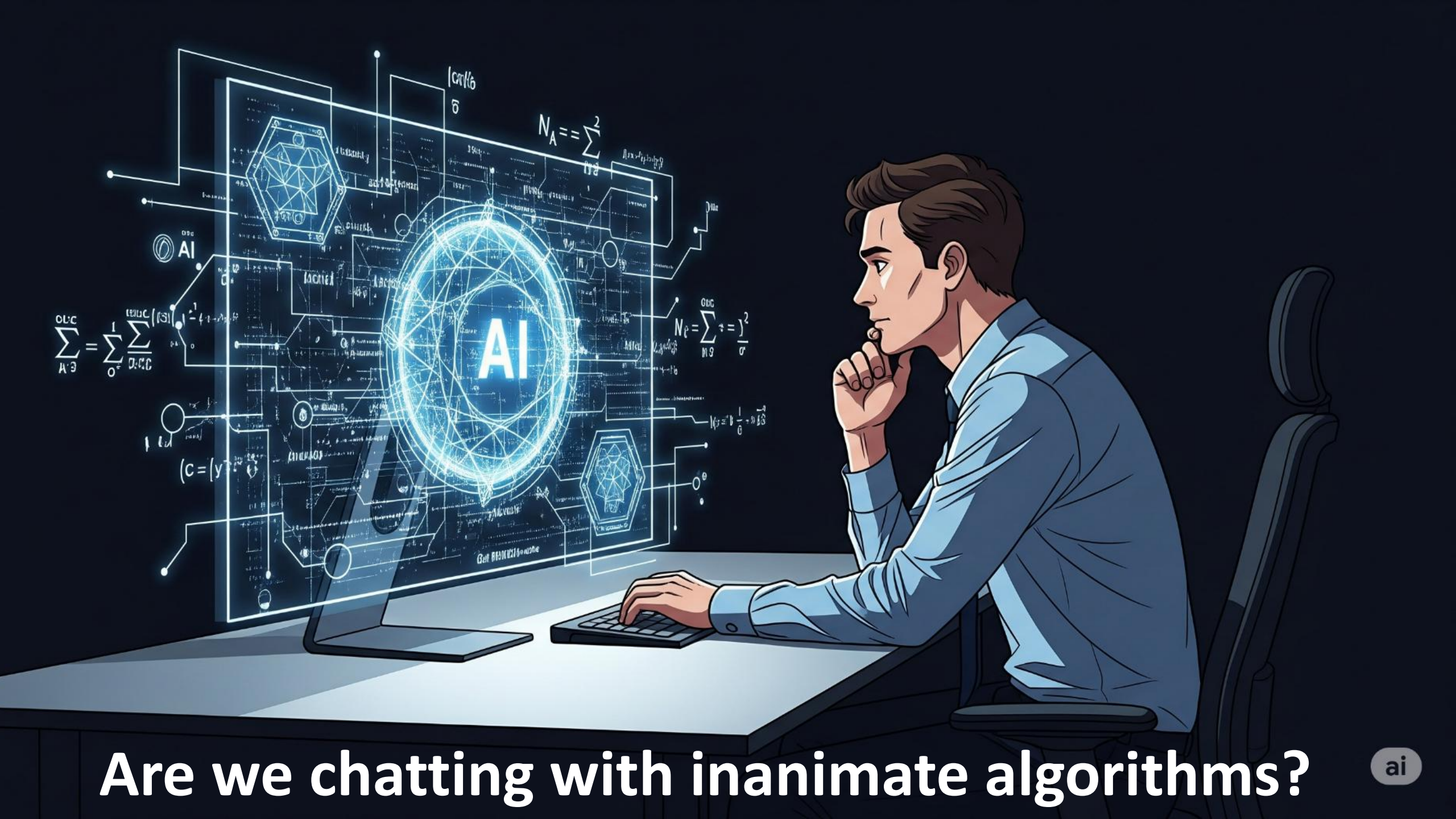
Face Recognition

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.

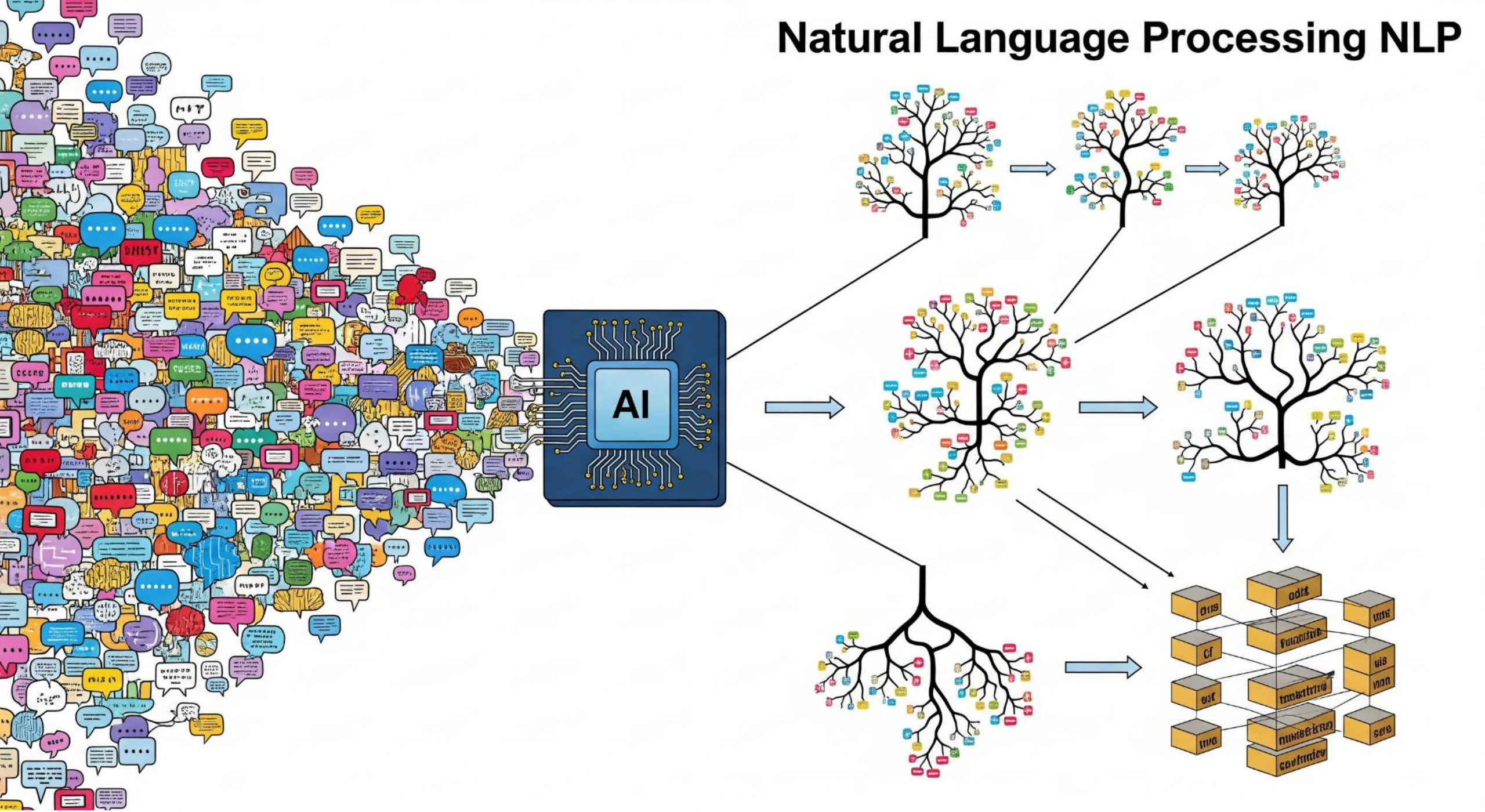
Would you say that resonates with you?



Are we chatting with inanimate algorithms?

Or is AI more human than we think?

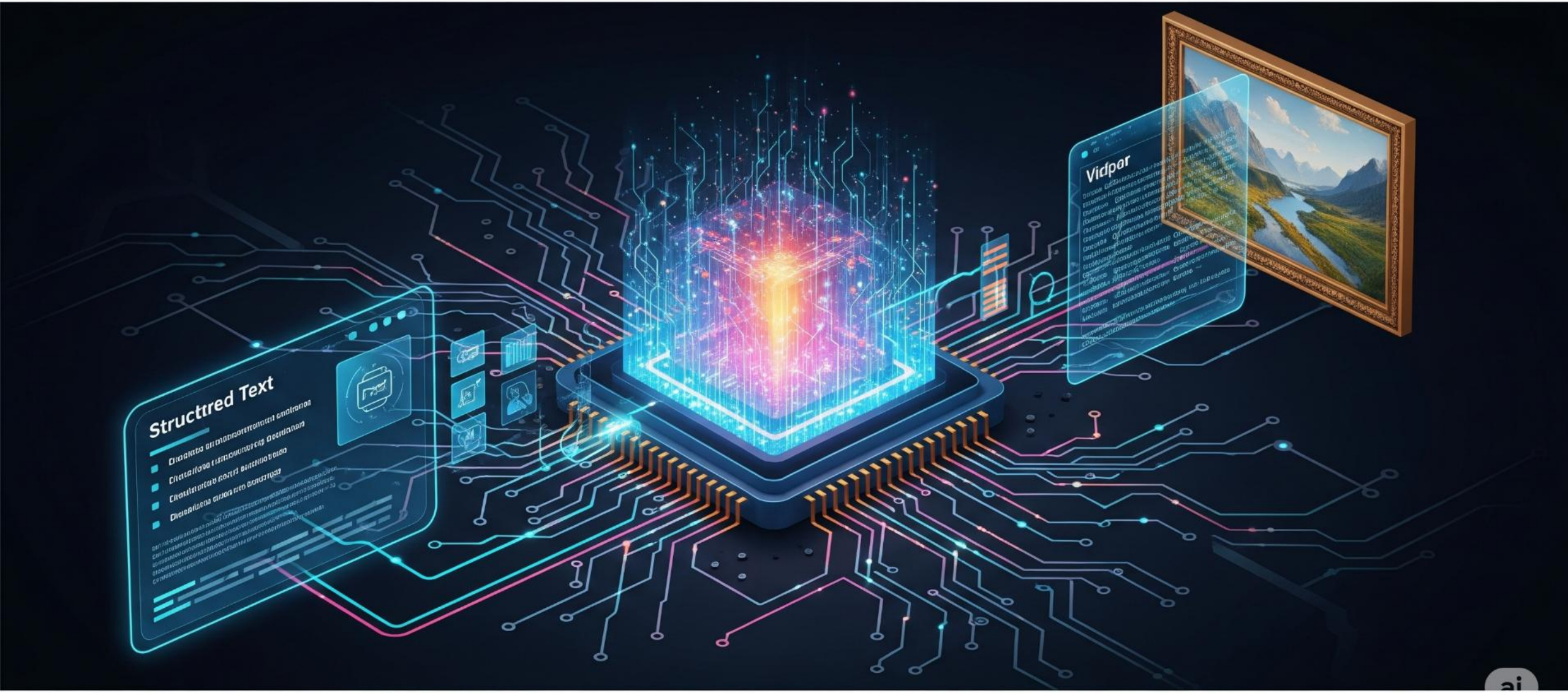
Natural Language Processing NLP



How AI finds

Finds an Answer in the database

AI Output Generation



The Black Box Effect

The Black Box Effect

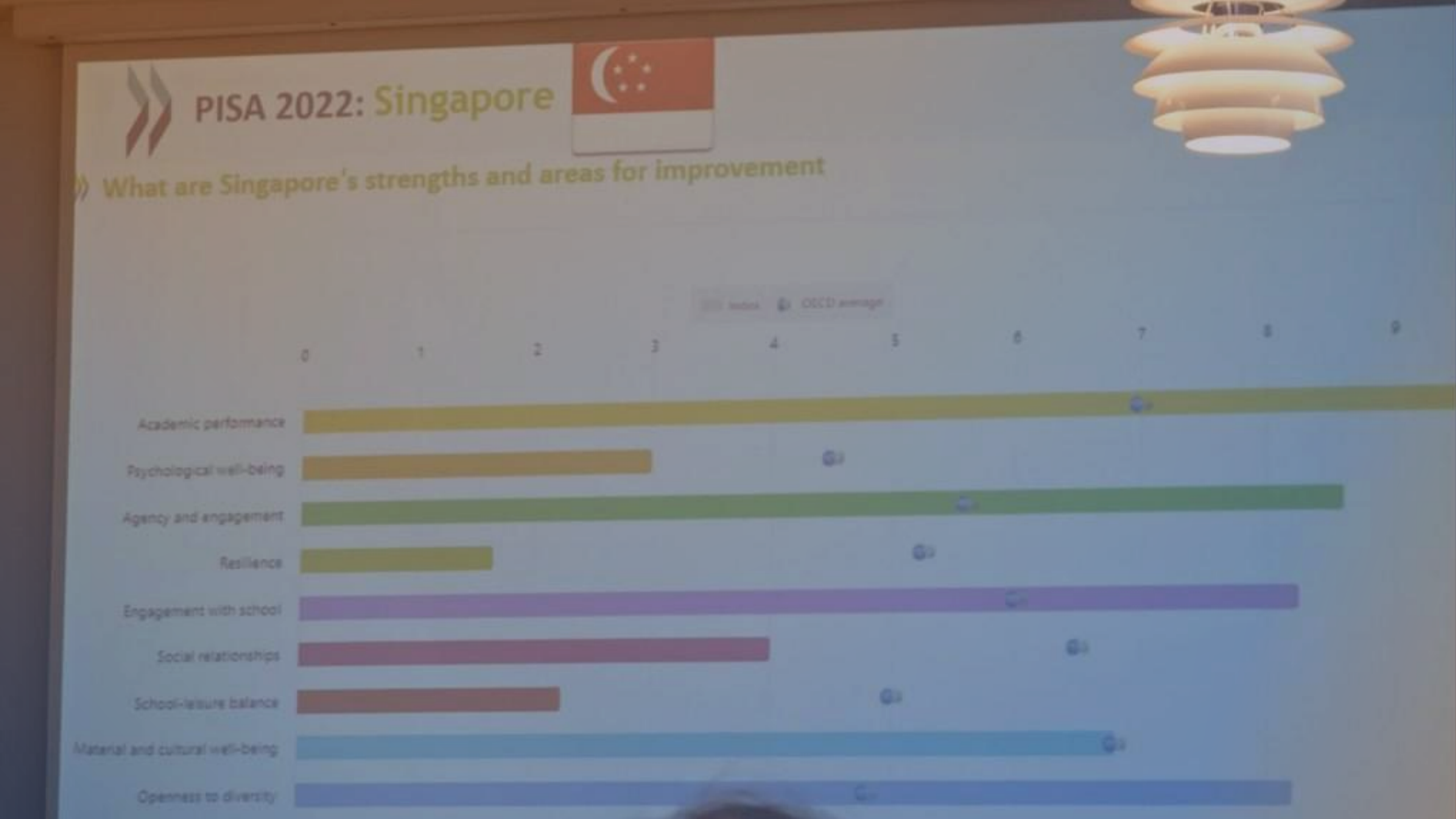
Learning about AI

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

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?


PISA 2022: Singapore
What are Singapore's strengths and areas for improvement
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OECD average
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7
8
9
Academic performance
Psychological well-being
Agency and engagement
Resilience
Engagement with school
Social relationships
School-leisure balance
Material and cultural well-being
Openness to diversity

PISA 2022: Singapore. What are Singapore's strengths and areas for

https://weevolvedlabs.org/apspisa/

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 and Cognitive Enhancement

AI Tool Data Classification & Terms of Use Summary (Jan 2026)

		PUBLIC DATA (Safe for Training)	INTERNAL DATA (Non-Sensitive/Caution)	CONFIDENTIAL / PII / RESTRICTED (Do Not Use)
GEMINI (Google)	**Free/ Consumer**	✅	⚠️ Opt-out required	❌ NO
	Enterprise (Workspace)	✅ Enterprise Agreement	✅ Safe	✅ Supported
CHATGPT (OpenAI)	**Free/Plus**	✅	⚠️ Opt-out required	❌ NO
	Team/ Enterprise	✅ Enterprise Agreement	✅ Safe	✅ SOC 2 Compliant
ELEVENLABS ElevenLabs (Voice Synthesis)		✅	⚠️ Text scripts only (Caution)	❌ NO (Voice Samples are Biometric PII) Free plan: Non-commercial use only
MANUS (Agent Platform) Manus (Autonomous Agent)		✅	⚠️ Sandboxed Env. (Caution)	❌ NO (High risk, agent access) Subject to acquisition & review (Jan 2026)

✅ = Allowed / Safe ⚠️ = Use with Caution / Specific Config Required ❌ = Prohibited / High Risk

DEVELOPING COGNITIVE EXTENSION AI ACTIVITIES

A 4-Step Workflow for Deep Learning Design

STEP 1: DEFINE THE CORE

Action: Select Grade Level & Subjects.

Goal: Establish clear learning objectives.

STEP 2: IDEATE & EXPAND

Tool: Gemini or ChatGPT.

Strategy: Ask for "Cognitive Extension" ideas that push beyond recall into application & synthesis. (e.g., "Generate 5 ideas to extend critical thinking").

STEP 3: GATHER RESOURCES

Tool: ChatGPT (Agent Mode/Web Search).

Action: Locate real-world data, primary sources, or case studies to ground the project.

STEP 4: REFINE & ALIGN (The Safety & Standards Check)

Tools: AI Ethics Framework Advisor & Curriculum Alignment Bots.

Action: Input draft to ensure it's ethical, safe, and strictly aligned with standards.

Outcome: Polished, compliant project.

Cognitive Extension: AI handles rote work, Students handle high-level reasoning.

workshop

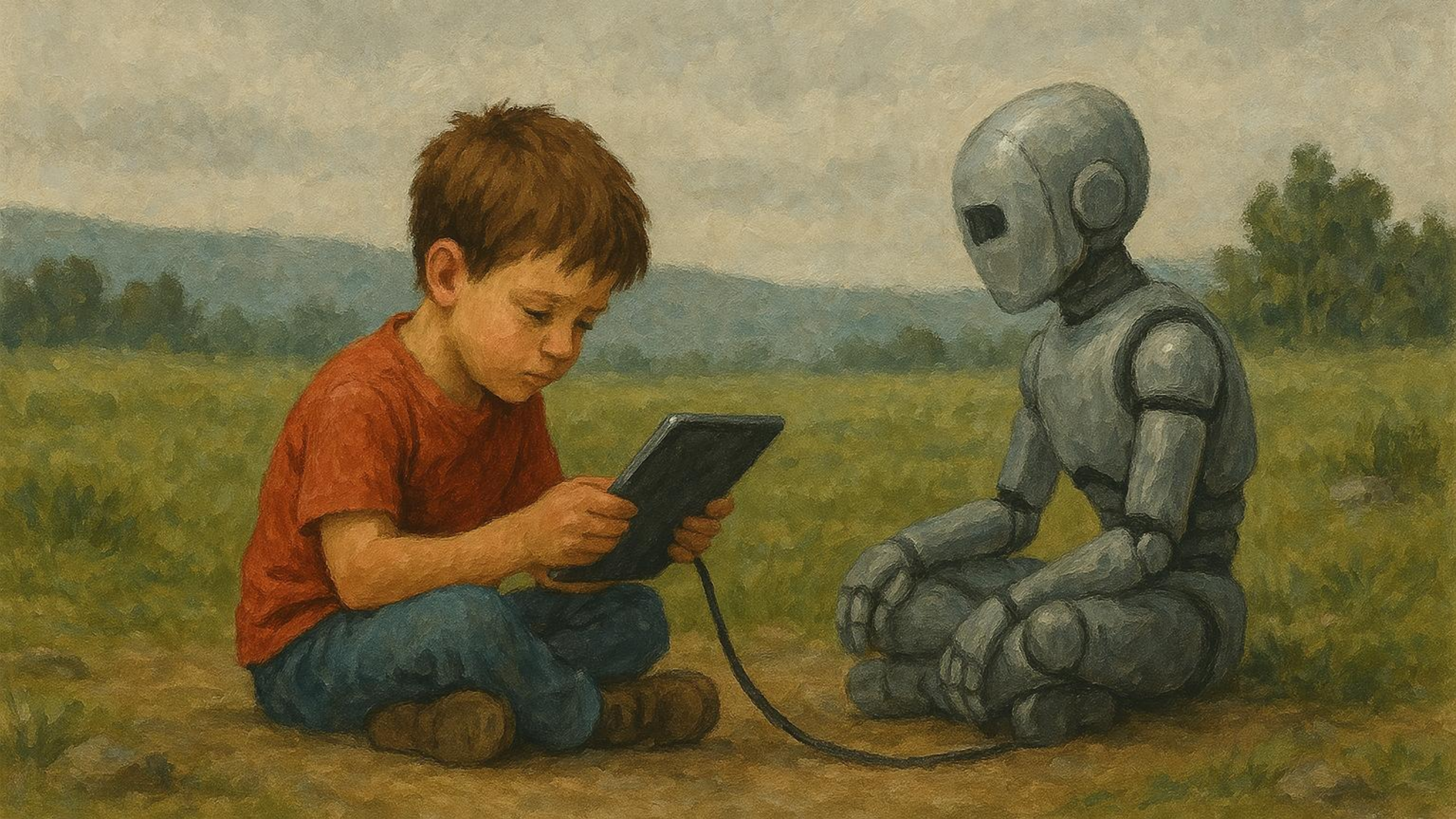
https://weevolvedlabs.org/sgmenu0/

https://weevolvedlabs.org/sgcognext

Multimedia Generation

Multimedia Generation

Multimedia 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

Conclusions - Discussion

Risks

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

+5491144195342

What´s next?

gabriel.rshaid@thelearnerspace.org