

2025 Oct. 16 (Thu) - AI & Robotics Strategic Innovation



Prof. **Fredrik Heintz**

PM 02:10 - 02:40

歐盟人工智慧大數據與機器人前瞻研發策略

AI, Data, and Robotics Strategies

Vice President AI Research, EU AI, Data and Robotics Association (ADRA)



AI, Data, and Robotics Strategies

Prof. Fredrik Heintz

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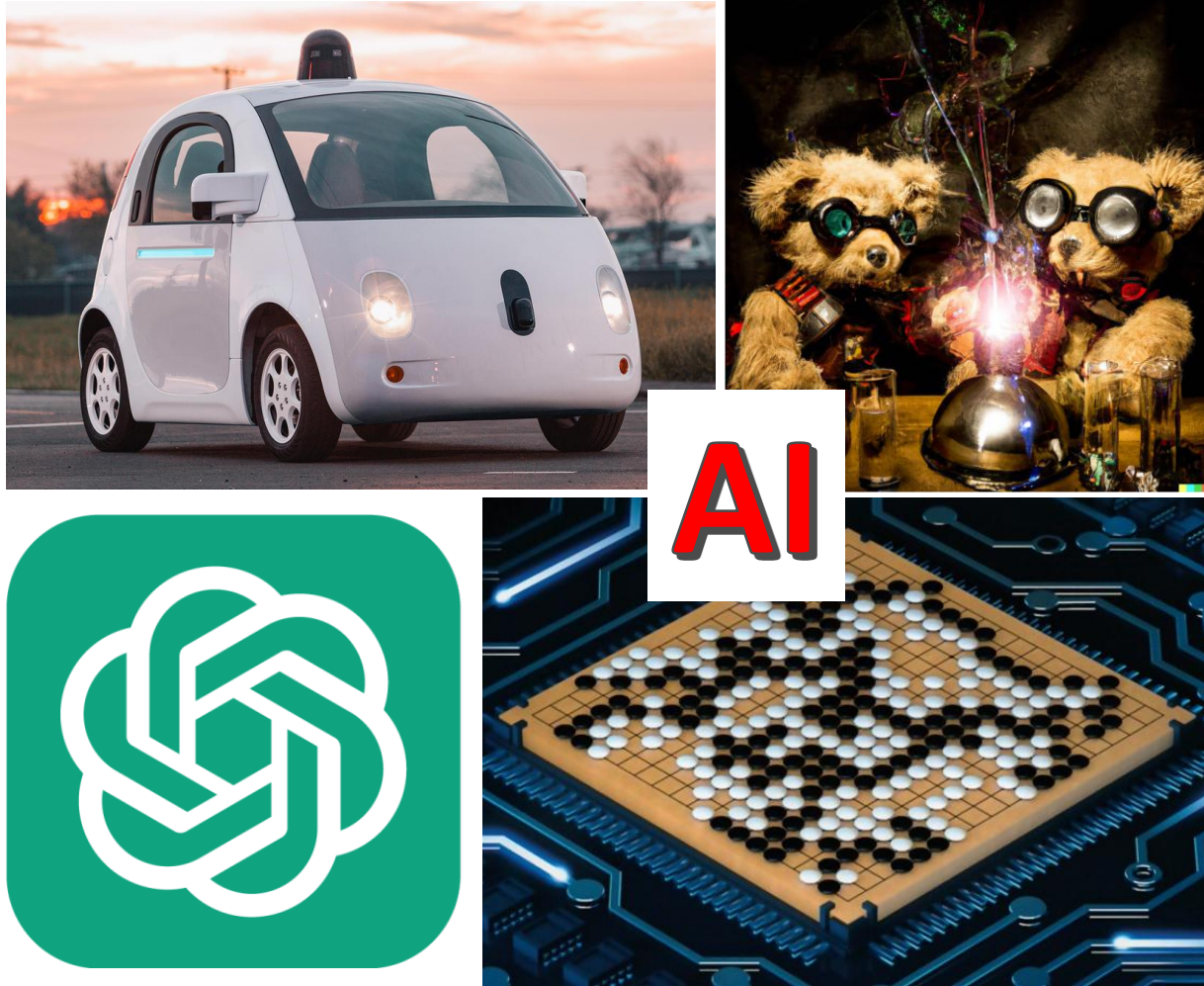
Director AI4x Center of Excellence

Co-Director WASP

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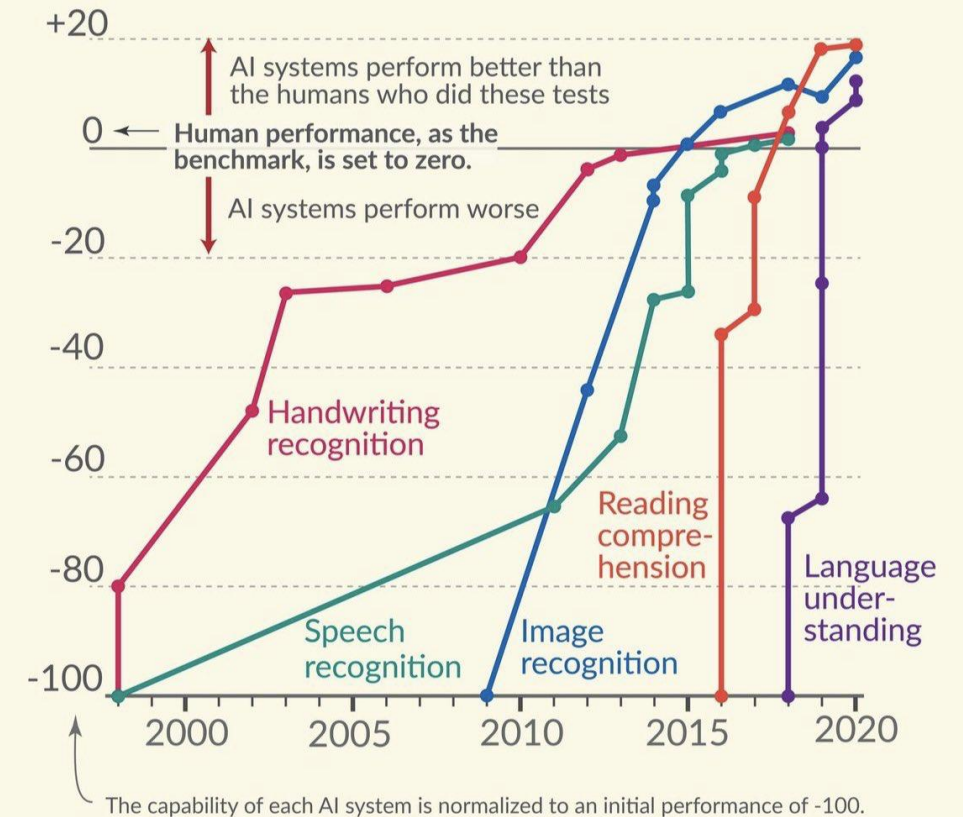


AI Development is Fast



Language and image recognition capabilities of AI systems have improved rapidly

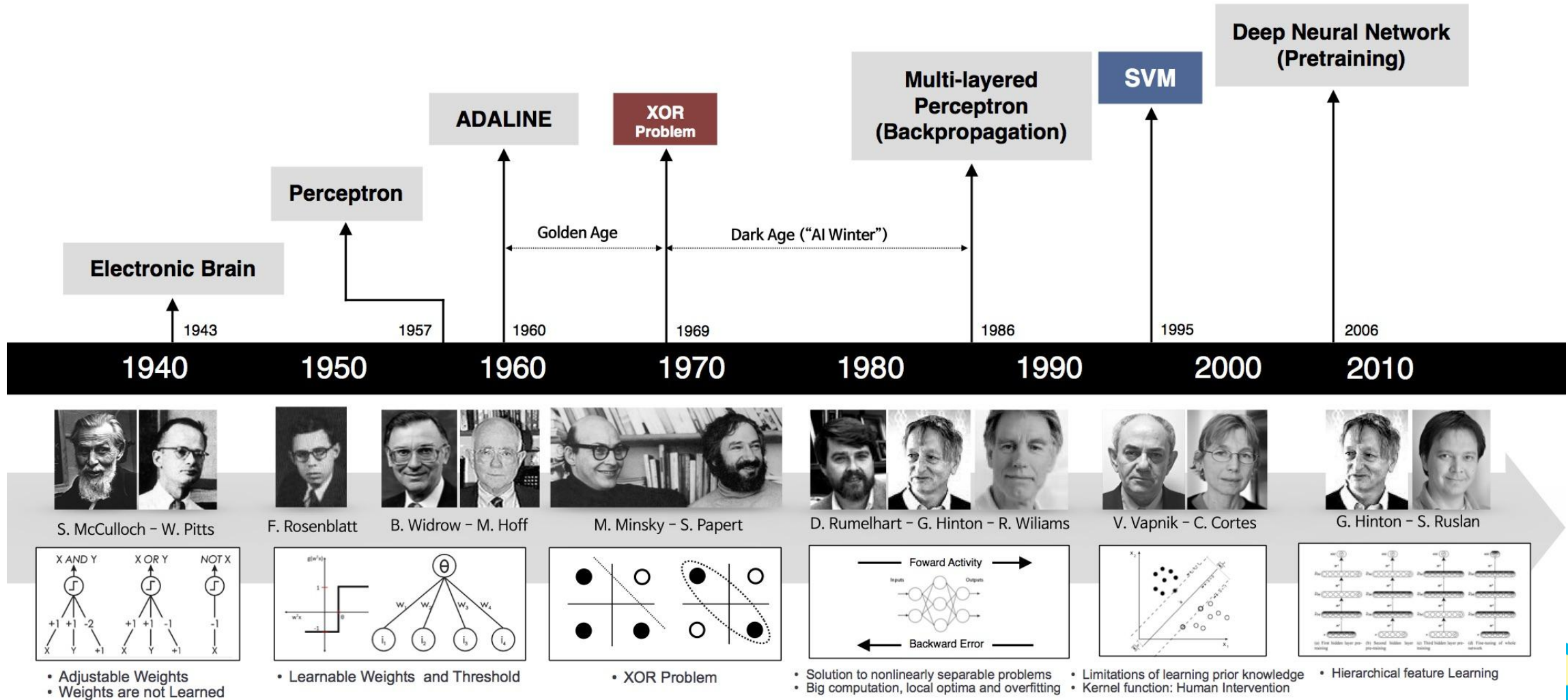
Test scores of the AI relative to human performance



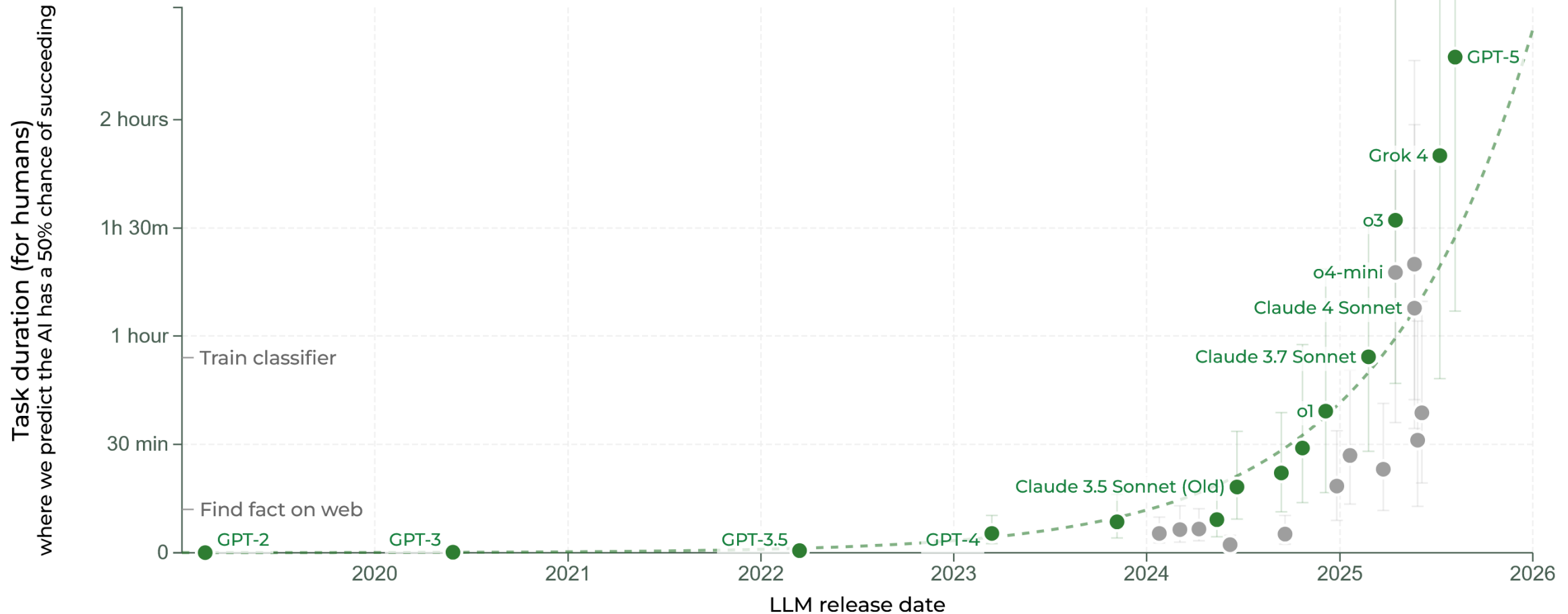
Source:
Kiela et al. (2021) Dynabench: Rethinking Benchmarking in NLP
OurWorldInData.org/artificial-intelligence • CC BY

Our World
in Data

Builds on Long-Term Basic Research



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

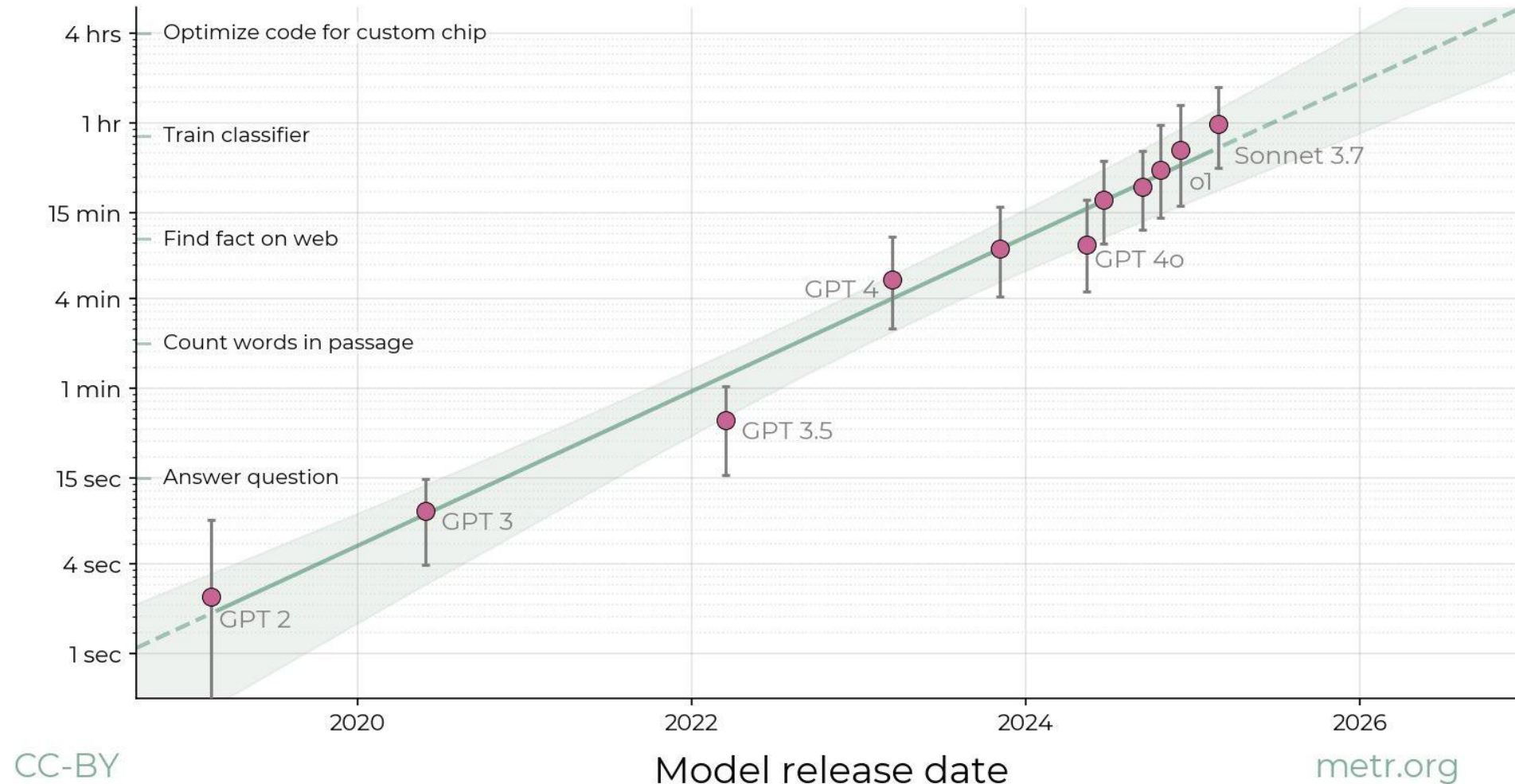


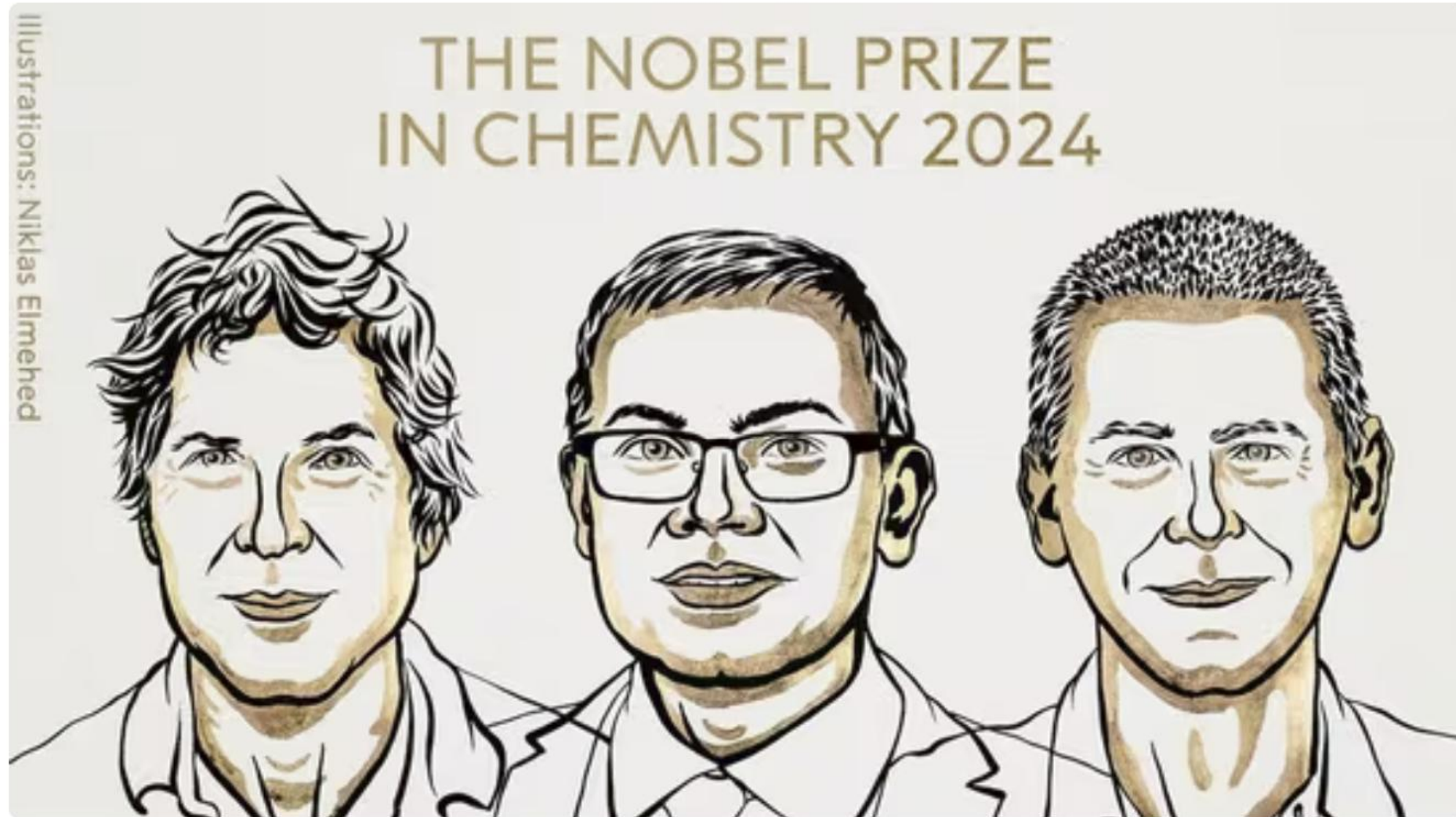
The length of tasks AIs can do is doubling every 7 months



METR

Task length (at 50% success rate)

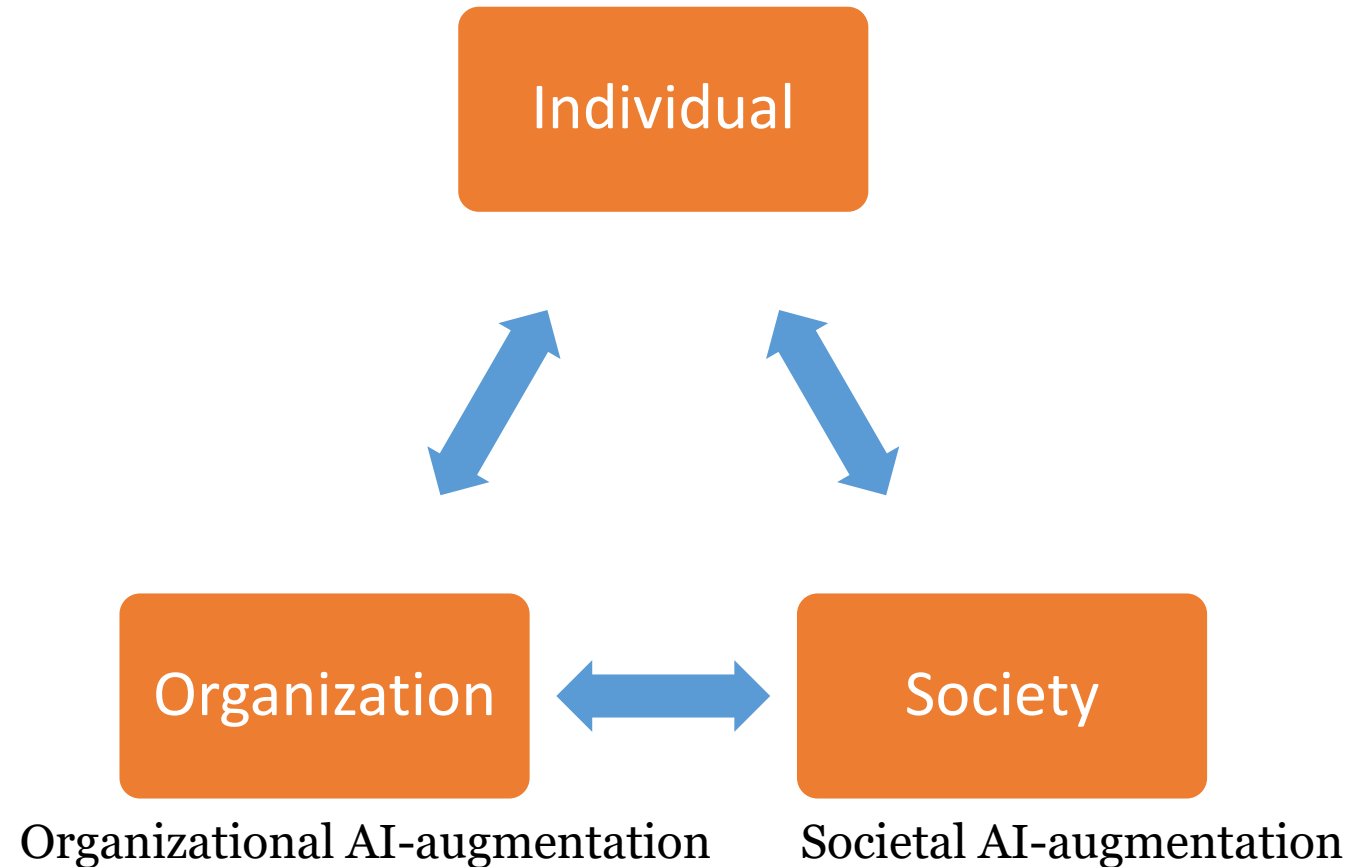




David Baker, Demis Hassabis, and John Jumper.(X / @NobelPrize)

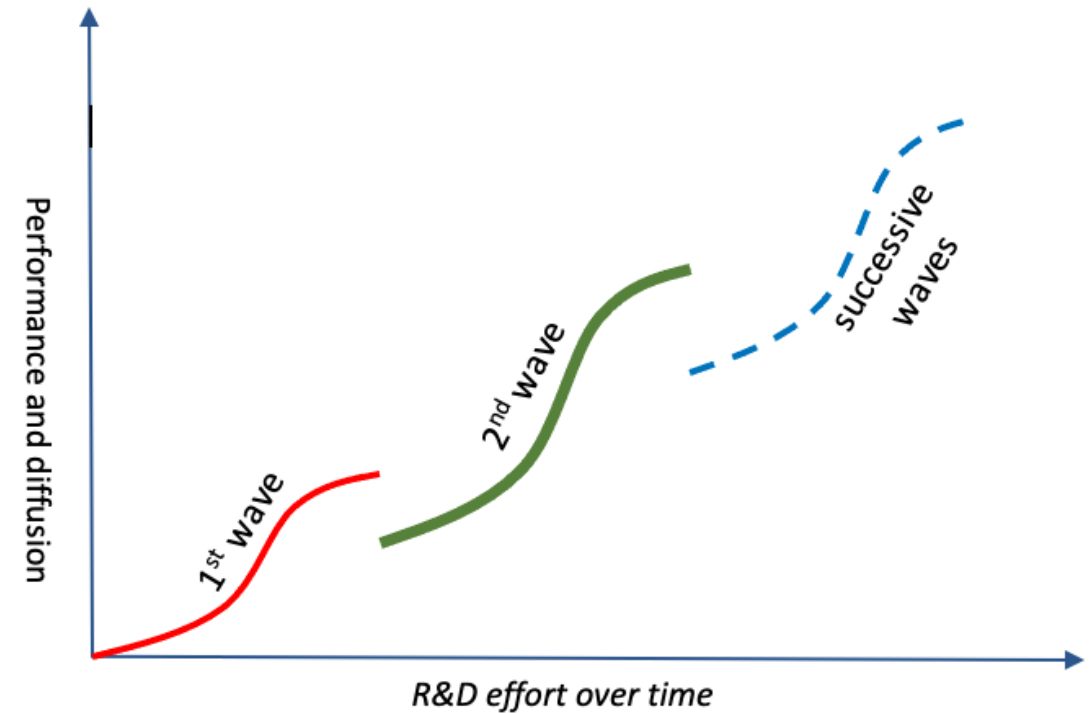
AI-Augmentation from Individual to Society

Individual AI-augmentation



AI Trends

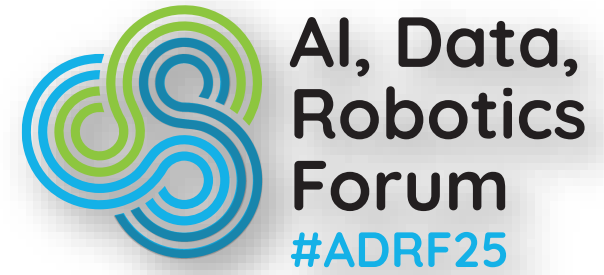
- From uni-modal to **multi-modal models**
- From next token prediction to **reasoning**
- From machine learning to **neurosymbolic AI**
- From chat to **agents**
- From language models to **world models**
- From digital AI to **physical AI**
- From automation to **Human-AI teaming**
- Towards **Cyber Resilient** and **Trustworthy AI**





The AI Data Robotics
Association

AI, Data and Robotics
Association



Strategic Research Innovation and Deployment Agenda

SRIDA: Strategic Research, Innovation and Deployment Agenda

Editors: Fredrik Heintz, Nabil Belbachir, Ed Curry

Coordination team: Ana Garcia, Katerina Linden, Philip Piatkiewicz

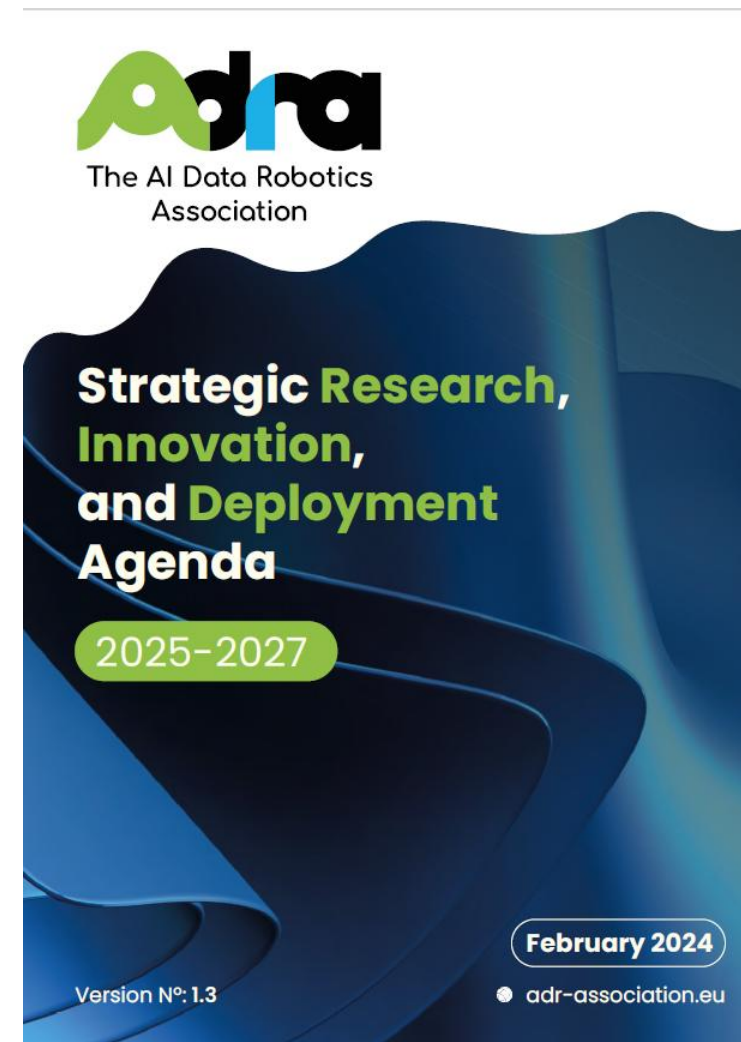
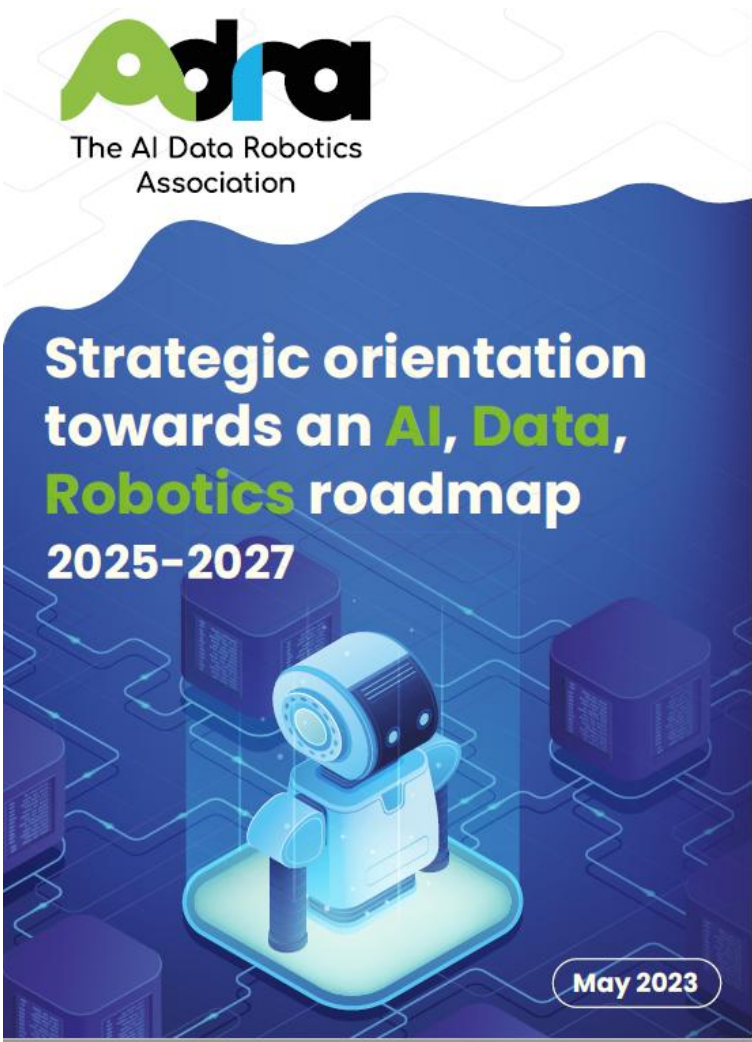
adr-association.eu

The AI, Data and Robotics partnership (2021-2030)



The MoU signed between Adra and the European Commission 2021

- Up to **1.3** billion euros of public investment by the European Commission (through Horizon Europe)
- Up to **1.3** billion euros of private investment through Adra



<https://adr-association.eu/blog/vision-2030-strategic-orientation-towards-ai-data-robotics-2025-2027/>

Adra SRIDA – Adra Missions



Creating a strong, coherent, and effective ecosystem for AI, Data, and Robotics



Maintaining and strengthening European industrial leadership in robotics and trustworthy AI



Integrating and connecting the European research landscape around AI, data and robotics



Developing a powerful strategy for skills development and attracting talent to Europe



Developing ADR technologies with high socio-economic impact to reinforce Europe's strong and globally competitive position



Ensure societal trust in AI, data and robotics



The European Union stands at a *crossroads* with regards to global tech leadership.



REPORT on artificial intelligence in a digital age (2020/2266(INI)) Special Committee on Artificial Intelligence in a Digital Age. Rapporteur: Axel Voss. https://www.europarl.europa.eu/cmsdata/246872/A9-0088_2022_EN.pdf

—Adra Position Paper – Strategic Directions High-Level

- **Trustworthy ADR technology made in Europe in compliance with the regulation** including the AI Act, the Data Act, and the Data Governance Act. Meeting regulation with innovation.
- **European strategic autonomy in ADR technology and the use of ADR technology to support strategic autonomy in other areas**, e.g., to optimize production cost and relocate production to EC.
- **Increasing the resilience of our society to crisis, both natural and man-made.** Improved preparedness as well as rapid, fast, and efficient response in catastrophic situations. Security and cybersecurity.
- **Green deal, sustainable society, zero carbon emission.** Operation, maintenance, and inspection of the circular economy and resource management.
- **Education on AI, Data and Robotics**, with a focus on scaling-up educational capacity and scaling-out education to other professions and subjects.

Adra Position Paper – Strategic Directions Technical

- **Large-scale general purpose ADR technology.** For example, open Large scale GDPR compliant European language models handling both language and cultural differences in Europe.
- **Large-scale complex ADR testbeds together with end-users** for example in healthcare, food production, transportation, energy, or smart cities.
- **Multi-stakeholder development, verification, validation, and integration of automated decision making** in socio-technical systems both for public and private sector.
- **Collaborative autonomous systems** interacting with both the environment and people. This includes autonomous drones in controlled airspace, last mile delivery, and self-driving vehicles.
- **Metrics for measuring progress in ADR,** with a special emphasis on Trustworthy ADR technology.

**Strategic orientation
towards an AI,
Robotics roadmap
2025-2027**

#1: Ground-breaking technological foundations in ADR (autonomy, high-performance and predictability)

#2: Effective and Trustworthy General-Purpose ADR (generative AI, generality, continuous learning, trust, scale and complexity)

#3: An interoperable and integrated framework for data and model ecosystems (operations, governance, privacy & security)

#4: Next generation smart embodied robotic systems (soft robotics, autonomy, manipulation, configurability, human robot interaction/collaboration)

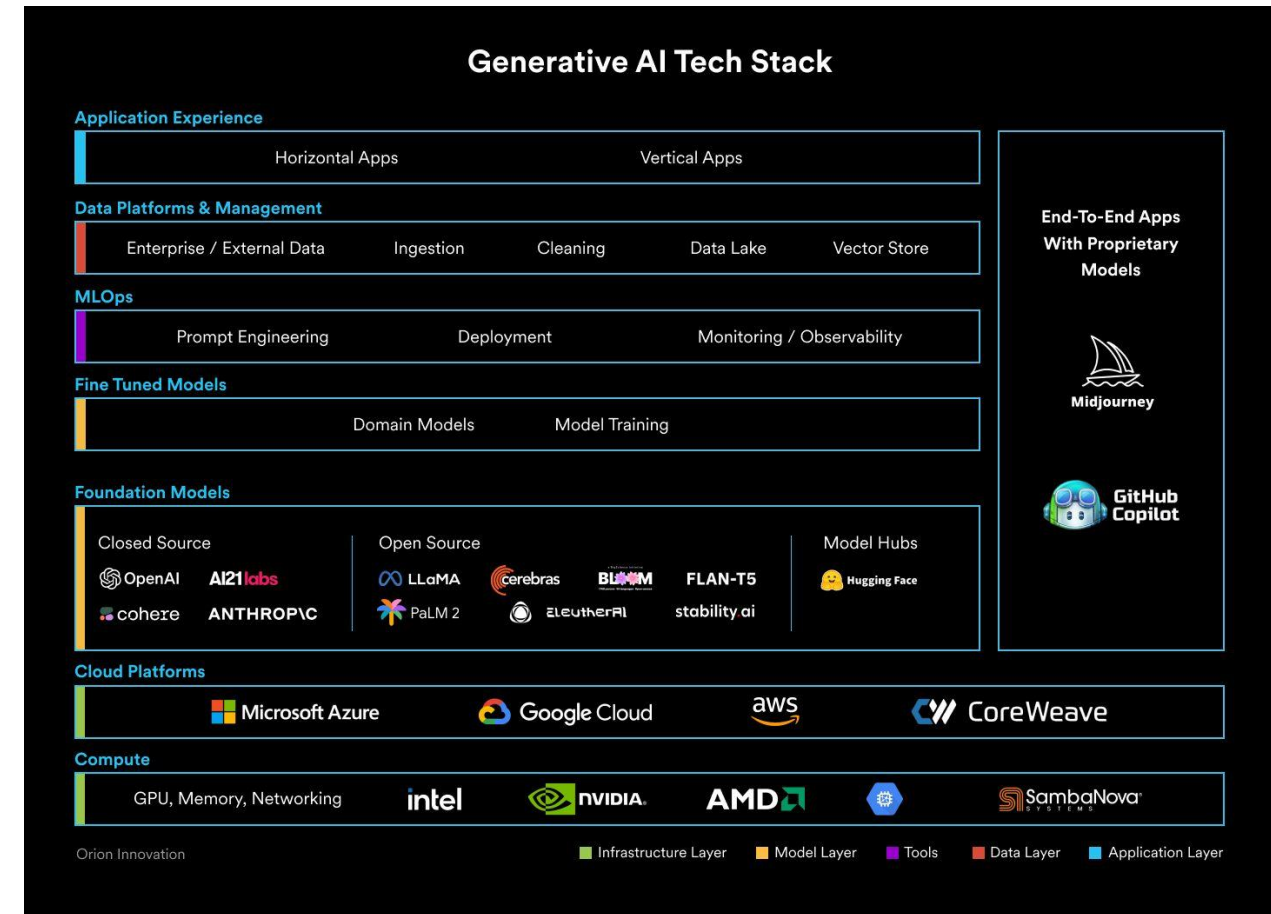
#5: Developing ADR technology for the sciences (from data to knowledge to understanding)

#6: Research, innovation, and tools for compliance (trust, privacy, security beyond compliance)

Strategic Directions

- Geopolitically complicated landscape
- Strengthening **competitiveness** and **industrialization**
 - The full AI stack
 - Cover supply chain
 - Moving up in TRL levels
 - AI Factories
- Scale and Speed
- ***Ensure that Europe develops state-of-the-art ADR technology, not only to strengthen its position on business leadership, but for the purpose of security, societal welfare and sustainability. AI for good and AI for all.***

#EUROSTACK: EUROPEAN STRATEGIC SOVEREIGN DIGITAL INFRASTRUCTURES



A scenic landscape featuring a body of water in the foreground, reflecting the sky and surrounding greenery. In the background, there are trees and a small white building with a blue roof. A blue rectangular box is overlaid on the right side of the image, containing white text.

AI commission

Roadmap *for* Sweden

Leadership and Governance

- Explicit national coordinated action
- Central Taskforce, secure implementation
- AI strategy based on the *Roadmap*
- Decide on the 63 proposals in the spring budget
- Decide on the 12 investigations
- The proposals are designed as a whole!



Cutting edge research in collaboration

- Excellence centers
- Post-docs and guest professors
- Shared positions academia/industry
- Graduate schools



Competence development for all

- increase lowest level

- Folkbildning
- AI hub, free AI tools, courses, forecasts, knowledge
- Teach the teachers
- New jobs will be created, others disappear
 - Effective transformation, education
 - We know how to do it



AI for a forward leaning public sector

- All of public sector should be able to use AI
- Common AI infrastructure
- AI Workshop for systematic learning and experimentation
- Guidance and inclusion support
- Regulatory sandboxes



Innovation, entrepreneurship and venture capital

- AI Factory and cutting edge competence foundation
- Support sector crossing collaboration
- Clear rules / legal certainty
- Companies with high technology risk and problems of scaling
- Multi-modal language models



AI Strengthens the Nation

- Healthier population
- Reduced crime and increased safety
- Effective use of public resources, faster decision, individual service
- Deliver higher quality service everywhere
- Improve competitiveness
- Strengthen security and defense



AI Ecosystem Research, Education and Innovation

Application and Use of AI

Authorities, regions, municipalities, companies

Innovation

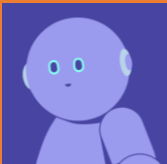


Avancerad
Digitalisering

Education and
Competence development



AI Competence
of Sweden



elementsofai.se

Infrastructure



Research

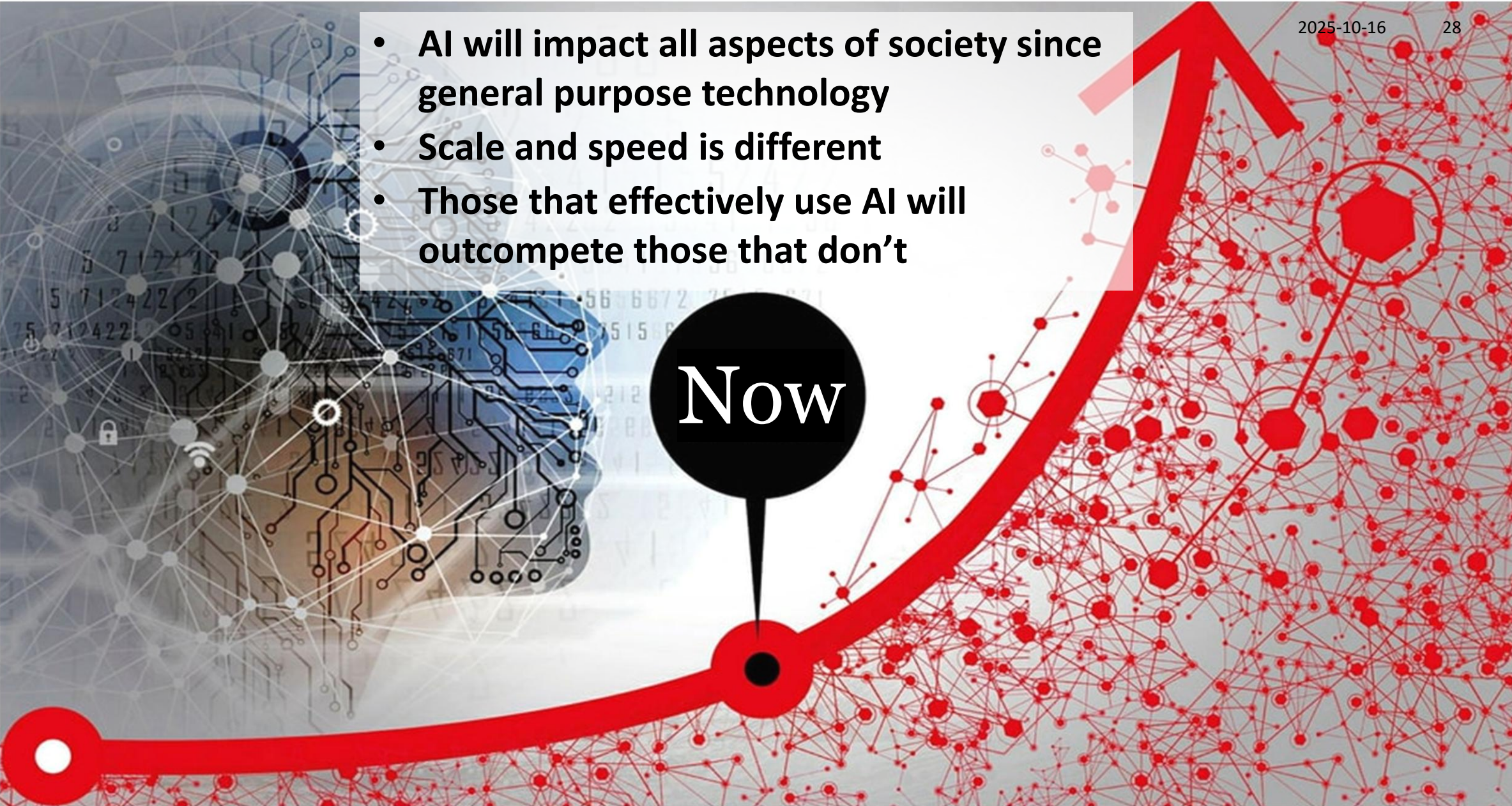


WASP
WALLER
AUTONOMOUS SYSTEMS
AND SOFTWARE PROGRAM



Other universities

- AI will impact all aspects of society since general purpose technology
- Scale and speed is different
- Those that effectively use AI will outcompete those that don't



Now