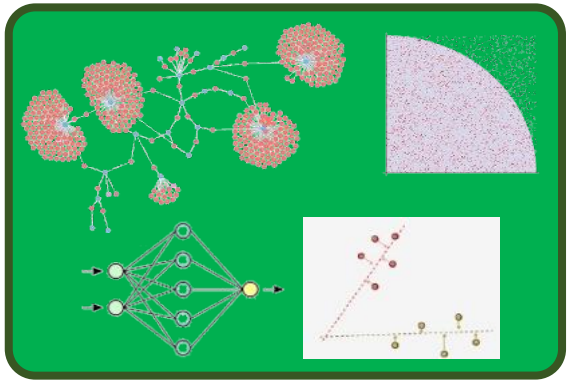
New Life, New World Powered by Data Processing

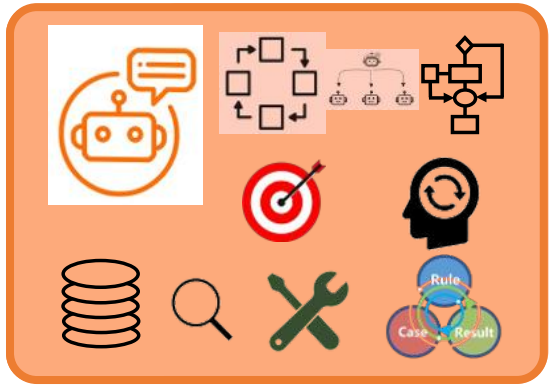
Dr. Hong ZHOU

Huawei European Research Institute, 4.11.2026

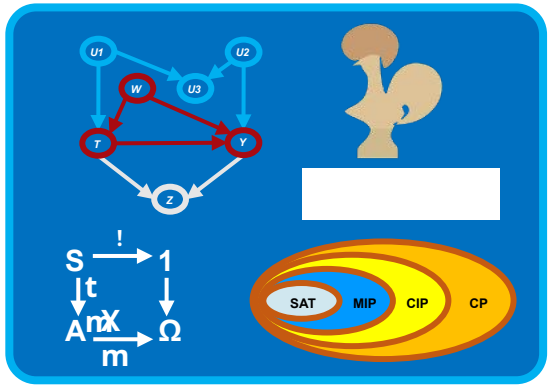
What



How



Why



Data Processing for X

Life













Production







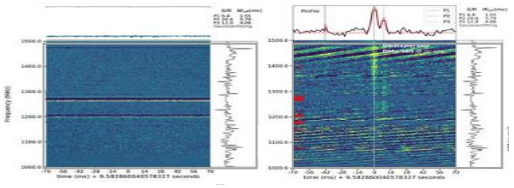
Environment

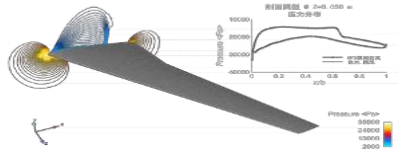


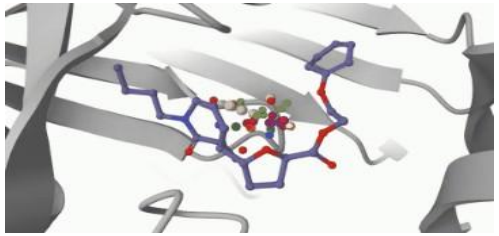




Science & Technology





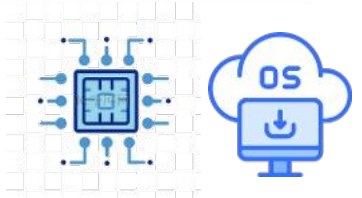


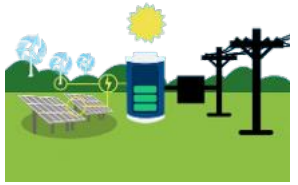












Sensing IS & Sparklink	**Communication** 5.5G/6G, Sparklink, FTTX/ION, Router	**Computing** Kunpeng & Ascend	**Storage** FlashLink, SmartMatrix & DME	**Control** A²MCU & RTOS	**Sustainable Energy** Inverter, Grid-

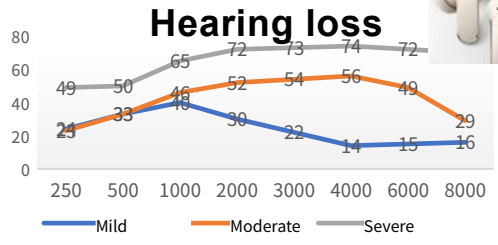
New Life -- Home, Office, Trip, Health, Entertainment

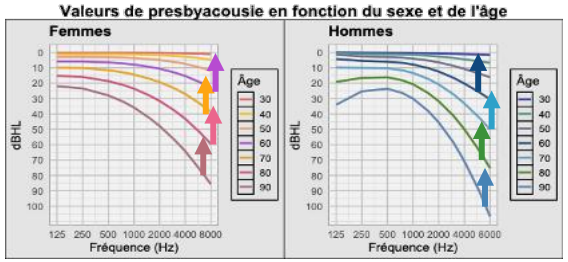
CPR Guide

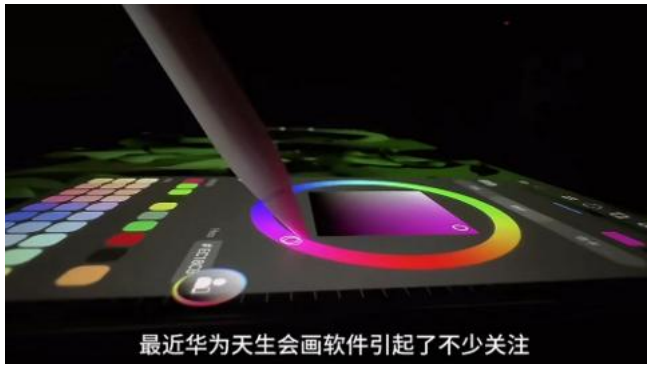


Hearing loss









GoPainting



Assisted Driving



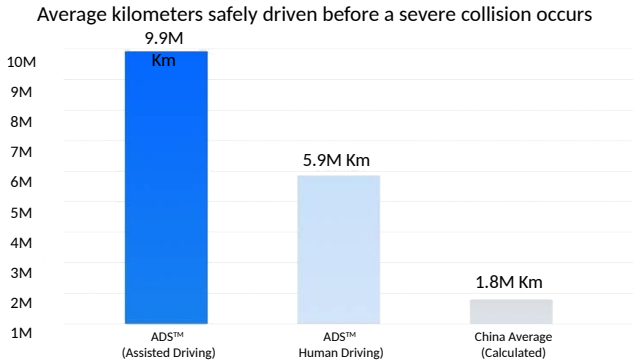
Slurred Speech Repairment



Blood Pressure



GoPiano



https://auto.huawei.com/cn/ads/safety-and-data-report

New Production



1 Safety: Awarded the title of "Safe Project" in the 2021 National Highway and Waterway Construction, and rated as the **highest level** "Promotion" case.

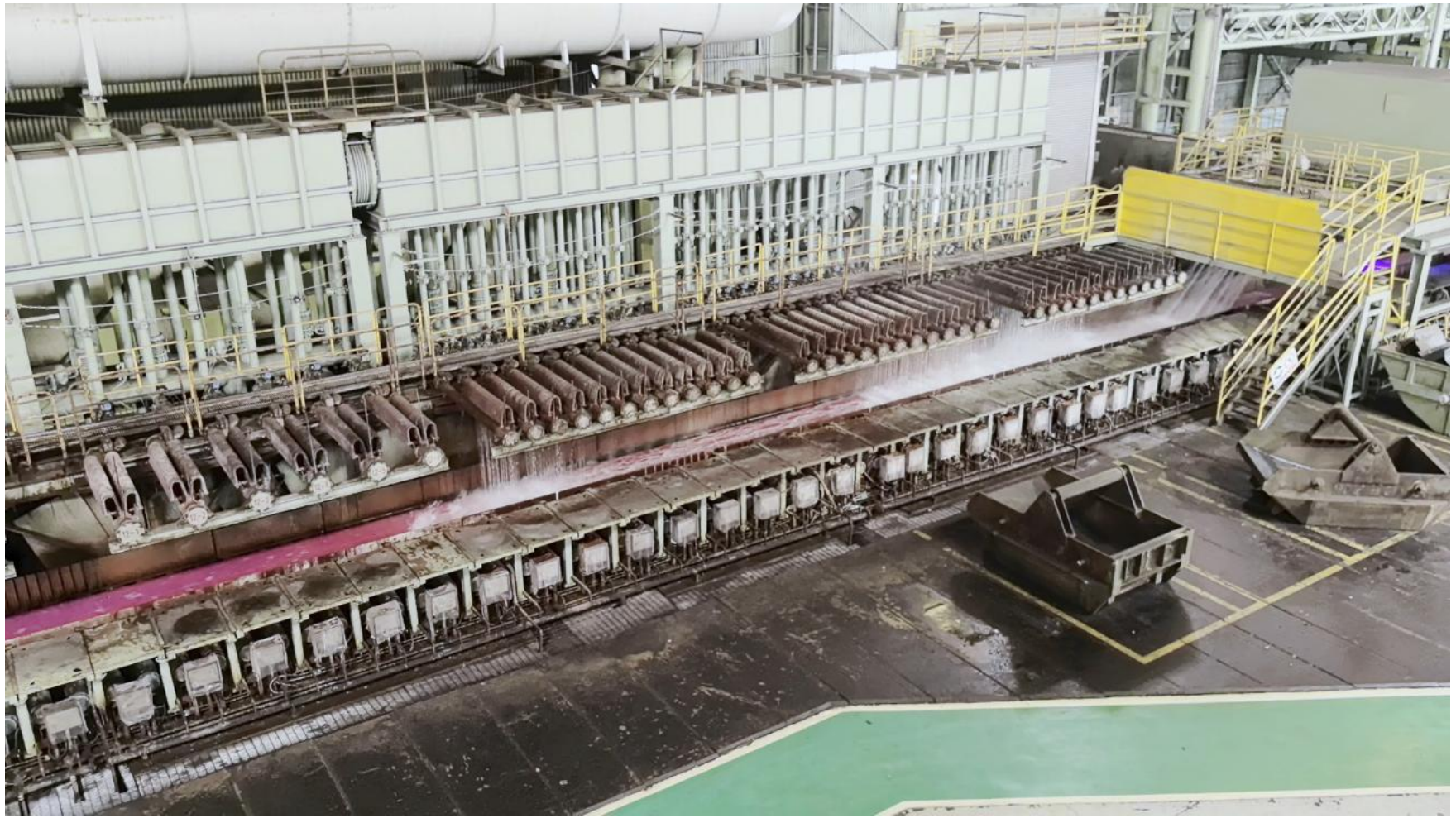
Loading and unloading speed: In March 2025, during the operation of the "Mediterranean Samar" vessel, the berthing efficiency reached 329 natural boxes/hour, and the peak efficiency reached 416 natural boxes/hour, **setting a new record**.

Green energy: Five wind turbines and solar panels, with a "wind-solar-storage-load integration" system of about 25MW, generate 63 million kWh annually, achieving **100% green electric power** supply.

2 Single-bridge crane efficiency increased by **20%**, and single-container energy consumption reduced by **20%**.

3 Investment savings of **30%**.

New Production



-9% Process Energy

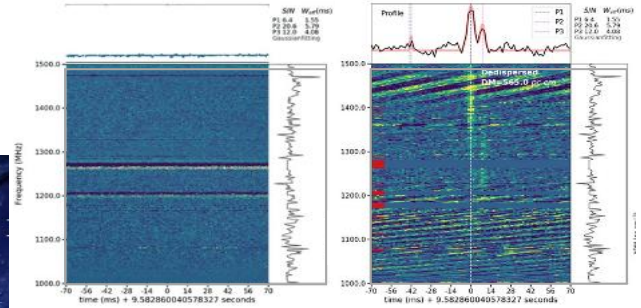
-20% Quality Costs

+30% Production Efficiency

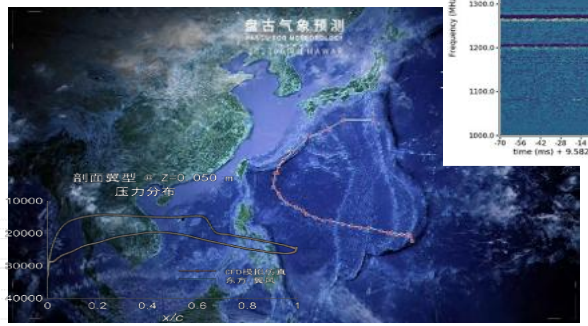
+75% Logistics Efficiency

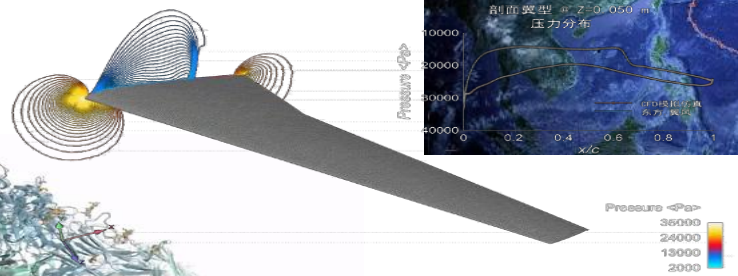
+11M€ Output Value / Year

New Science and Technology

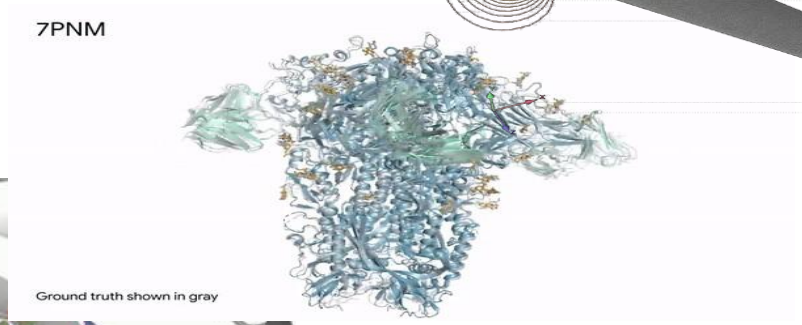


Cosmic

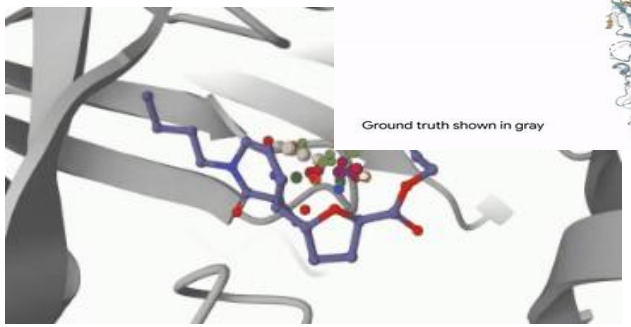




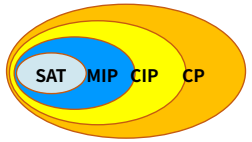
Macroscope



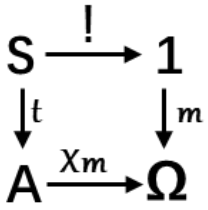
Mesoscope

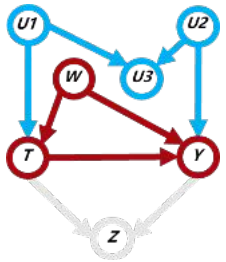


Microscope





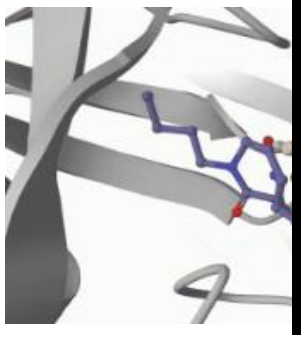




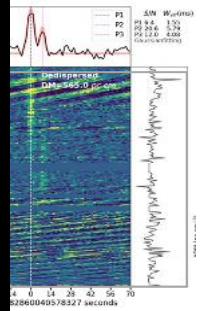
Weak-signal High-dimention Uncertain Undecidable Monarchy Causal ……

New Science and Technology

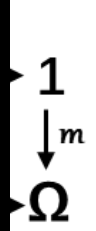
New Antibiotic

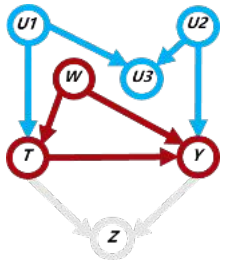






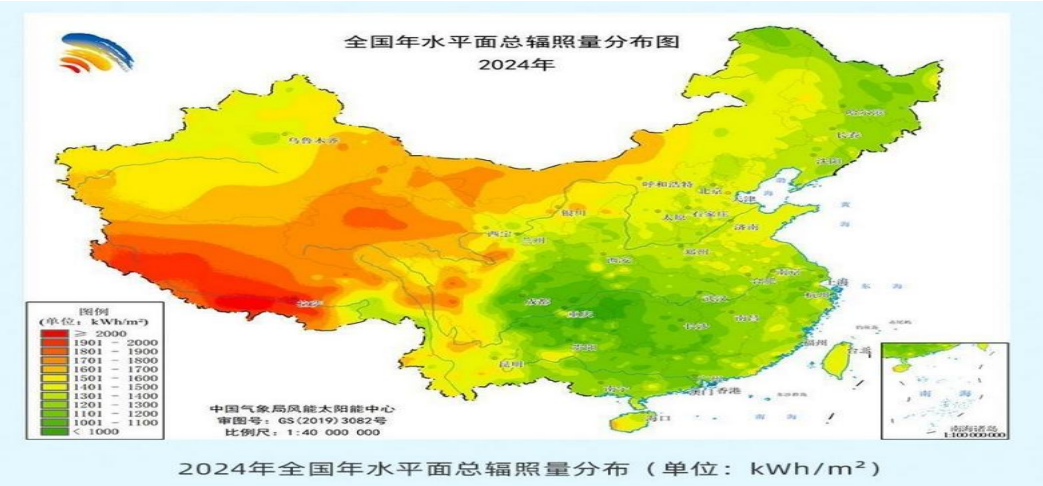
Cosmic





Weak-signal High-dimention Uncertain Undecidable Monarchy Causal ……

New Environment













Generation

Coal 0.3 ￥ ~0.6 ￥ per kWh
Solar 0.1 ￥ ~0.28 ￥ per kWh

Storage

Solar Thermal (+Storage) 0.55 ￥ per kWh
Battery 0.62 ￥ ~0.82 ￥ per kWh

Usage (Trucks)

Diesel 2 ￥ ~3 ￥ per kilometer
Electric 1 ￥ per kilometer

New Environment

3M ~ 5M， Collapse due to Long-term Disrepair 0.001%~0.005%

Dangerous: China 5%~8%， USA 7.5%， Europe 10%~15%



The Carola Bridge in Dresden, 2024



Pont de Mirepoix-sur-Tarn, 2019

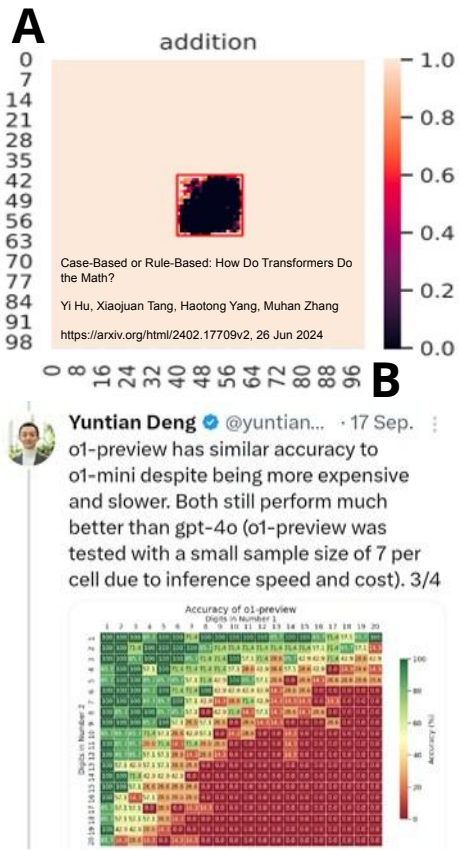


Railway bridge across the River Spey, 2026



ShanDong ZiBo, 2013

Challenge: OOD, Structural and Invariant Information

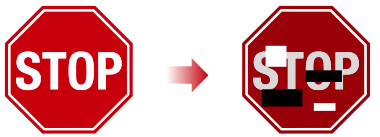


Source: https://x.com/yuntiandeng/status/1836114401213989366

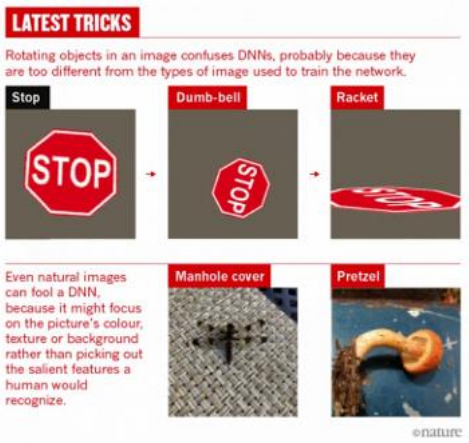


Fooling the AI

Deep neural networks (DNNs) are brilliant at image recognition - but they can be easily hacked.
These stickers made an artificial-intelligence system read this stop sign as 'speed limit 45'.

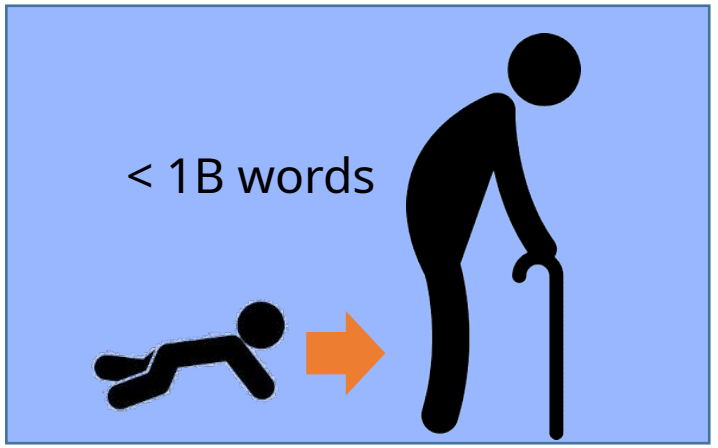


Stop — Speed limit 45

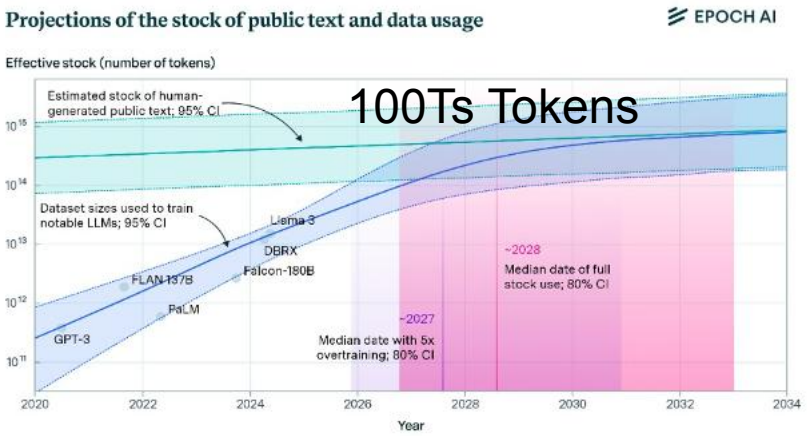


Source: J. IEEE Conf. Comp. Vision Pattern Recog. 2015, 427–436 (2015).
Nguyen, A., Yosinski, J. & Clune.

Challenge: Energy and Data Efficiency

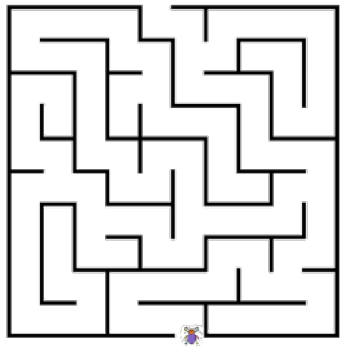




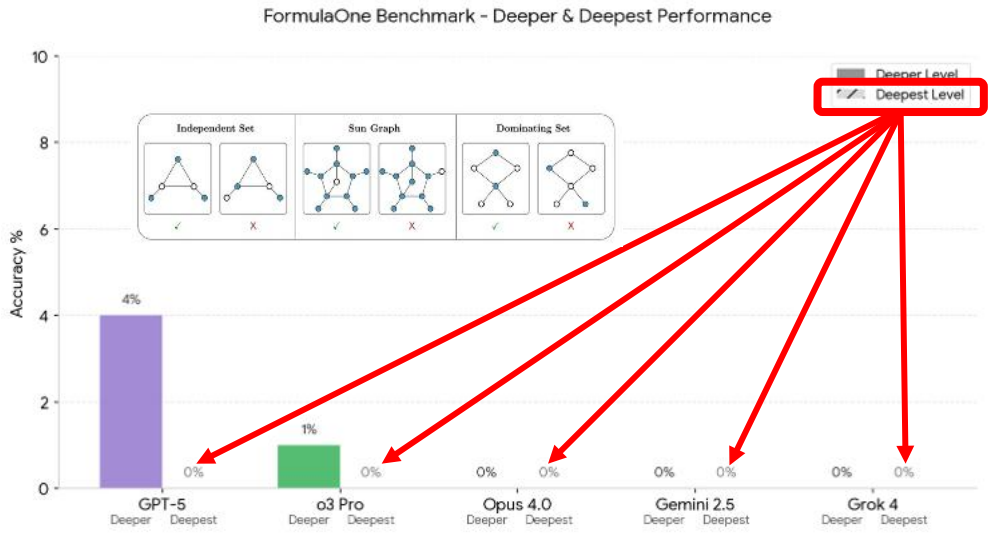


Year	OOMs	H100s-equivalent	Cost	Power	Power reference class
2022	~GPT-4 cluster	~10k	~$500M	~10 MW	~10,000 average homes
~2024	+1 OOM	~100k	$billions	~100MW	~100,000 homes
~2026	+2 OOMs	~1M	$10s of billions	~1 GW	The Hoover Dam, or a large nuclear reactor
~2028	+3 OOMs	~10M	$100s of billions	~10 GW	A small/medium US state
~2030	+4 OOMs	~100M	$1T+	~100GW	>20% of US electricity production

Challenge: Long-Horizon Reasoning



Algorithm	Time Complexity (Worst-Case)	Space Complexity (Worst-Case)
BFS	O(V + E)	O(V)
DFS	O(V + E)	O(V)
Dijkstra	O((V + E) log V)	O(V)
A* Search	O(b^d) / Up to O(V log V)	O(V)
Dead-end Filling	O(V + E)	O(V)
Tremaux	O(V)	O(V)



https://www.doubleai.com/research/formulaone-a-benchmark-for-deep-algorithmic-reasoning

FormulaOne

Hamiltonian Cycle/Path

Feedback Vertex/Edge Set

K-Domination Set

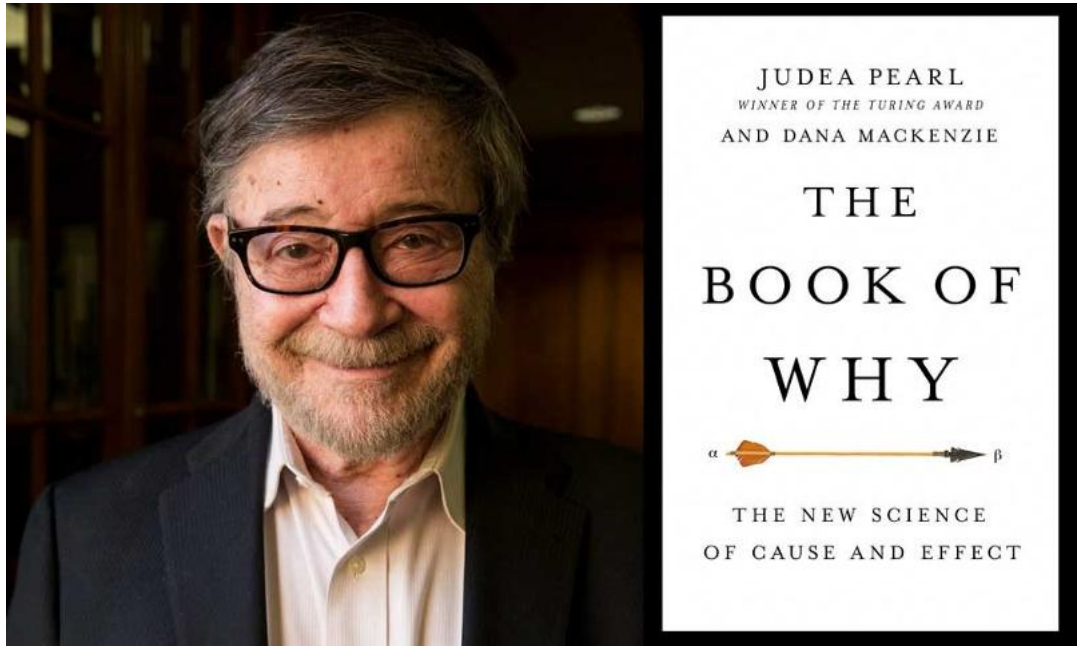
Maximum Independent Set

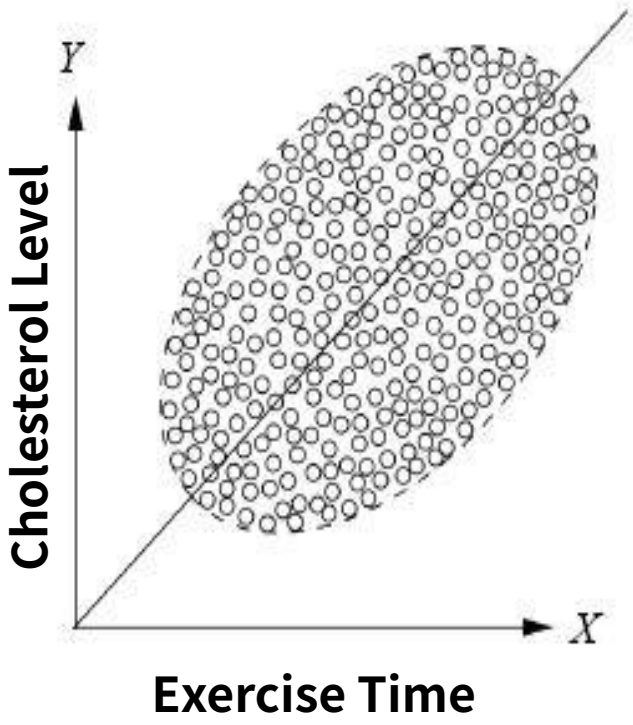
P problem with Bounded Treewidth Graphs and Monadic Second-Order Logic.

VS

Brute force exponential **NP** computing.

Challenge: Truth or False





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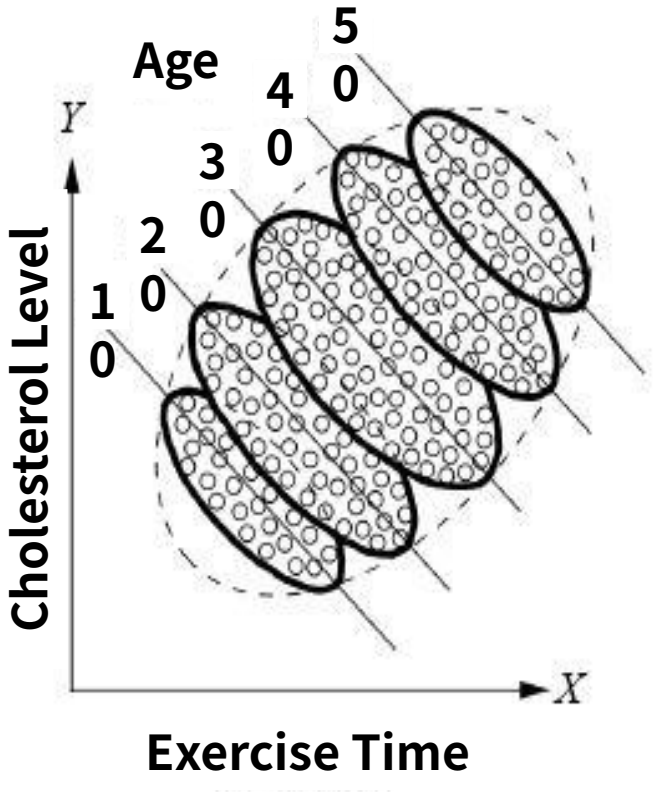
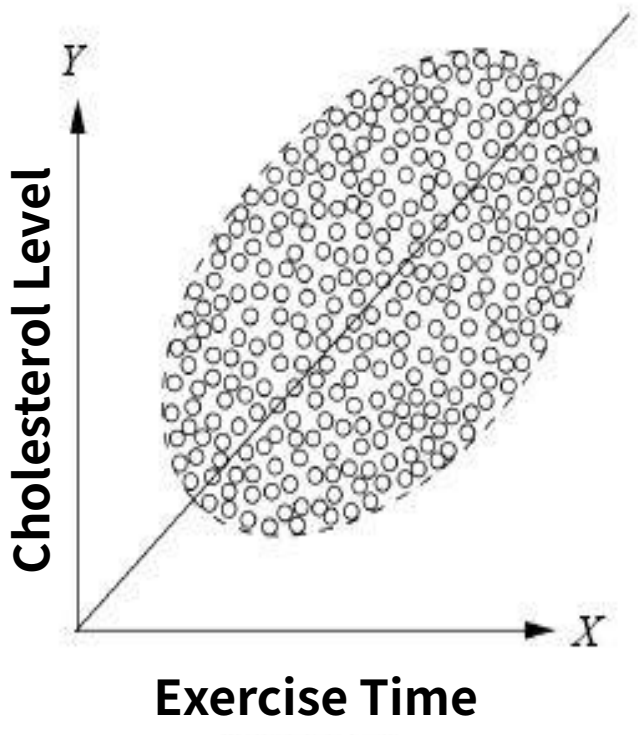
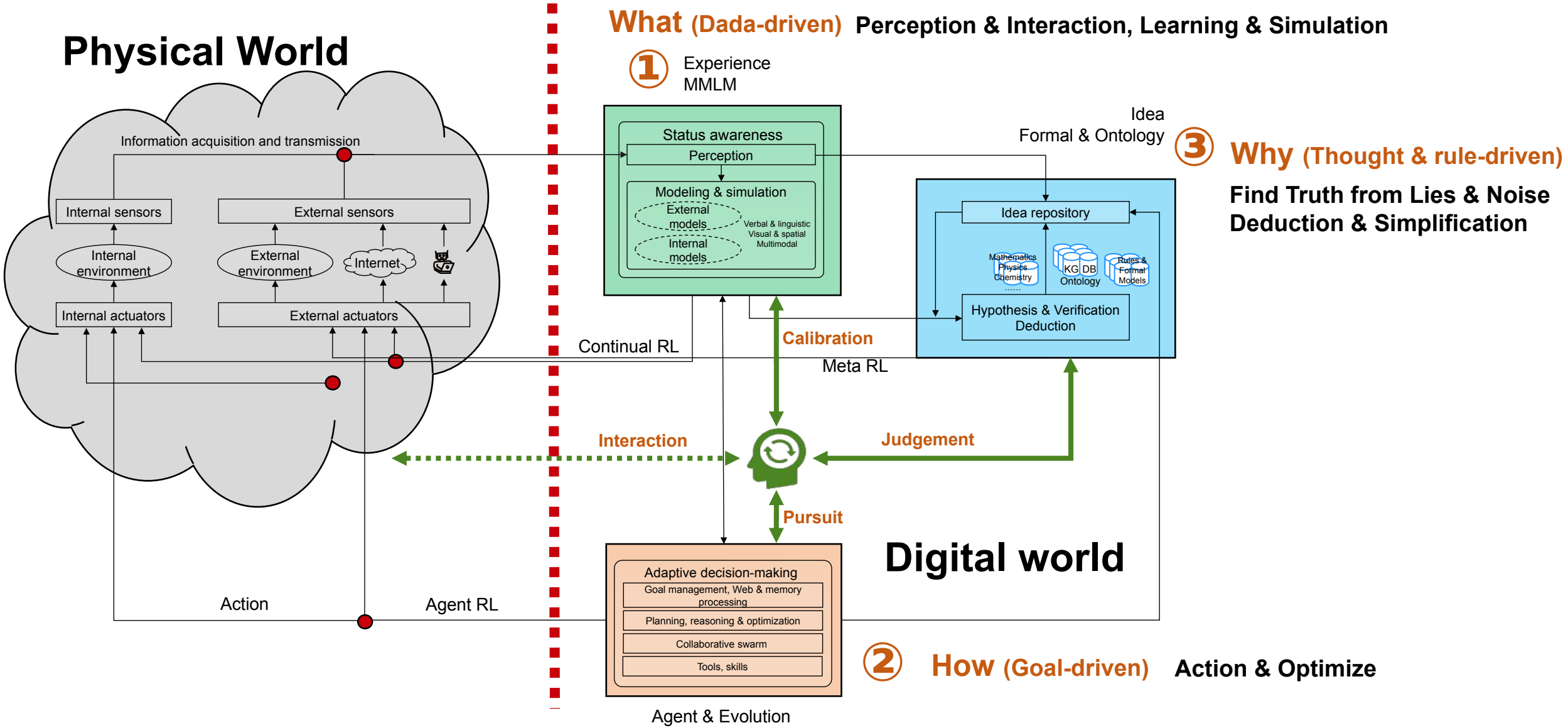
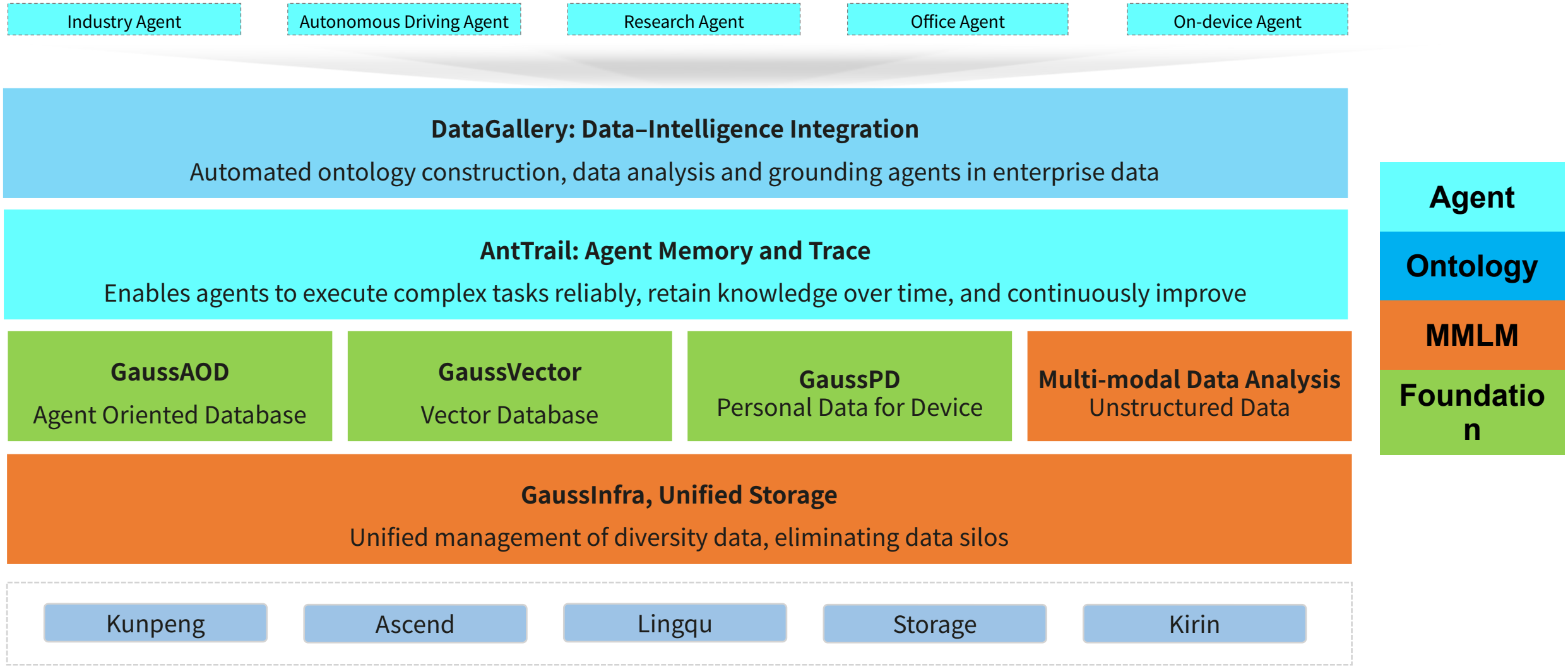




Possible Solution: 3 Engines for ABI https://iclr.cc/virtual/2025/workshop/24000 Keynote # 6



Possible Solution: AI Data Infrastructure




THE BEST WAY TO PREDICT
THE FUTURE IS TO CREATE IT