# AIAgents

State of the Union



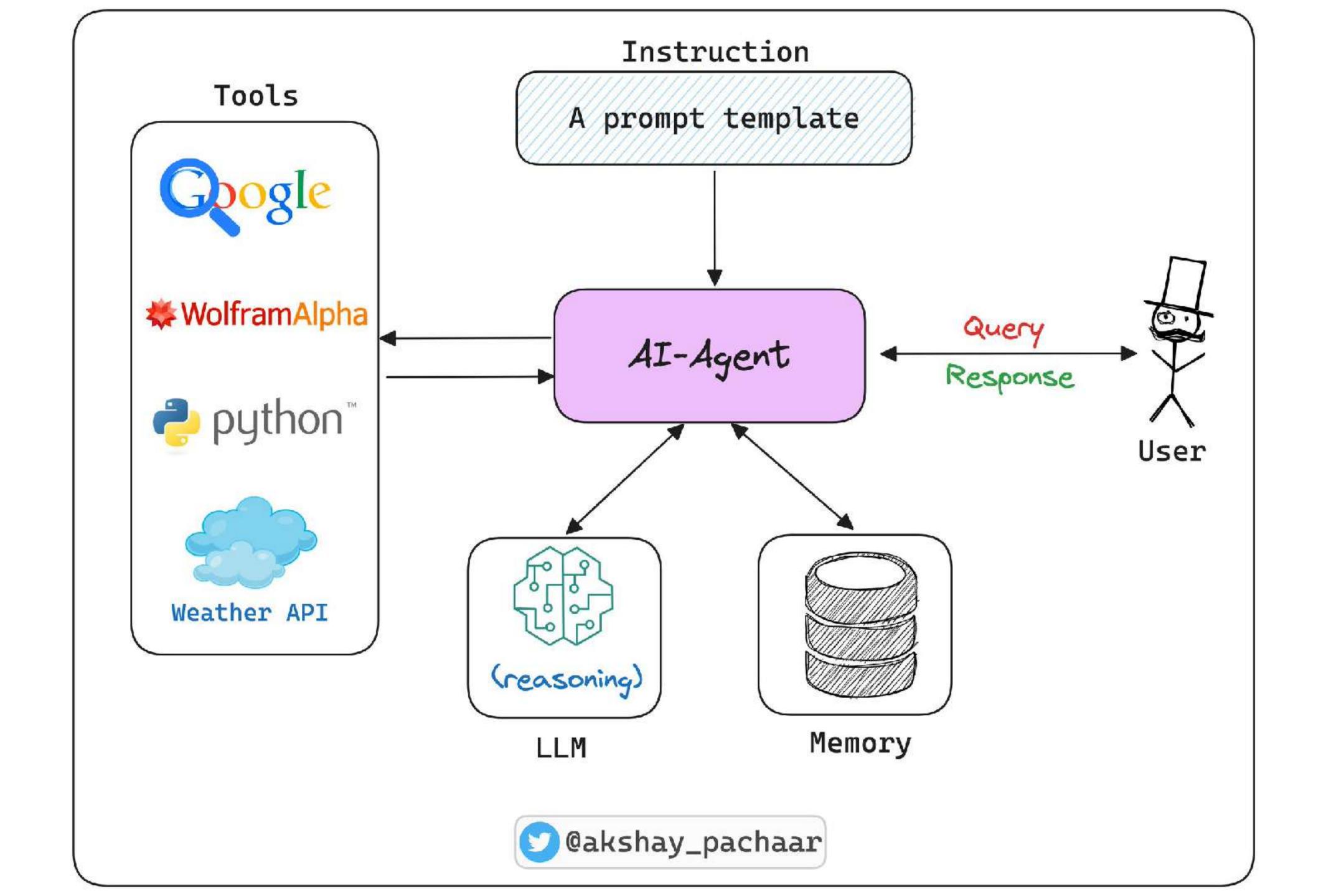
if you value intelligence above all other human qualities, you're gonna have a bad time

6:10 PM · Oct 6, 2023 · 6.5M Views

## Agenda

- What is an Al Agent?
- What's possible?
- What's coming?

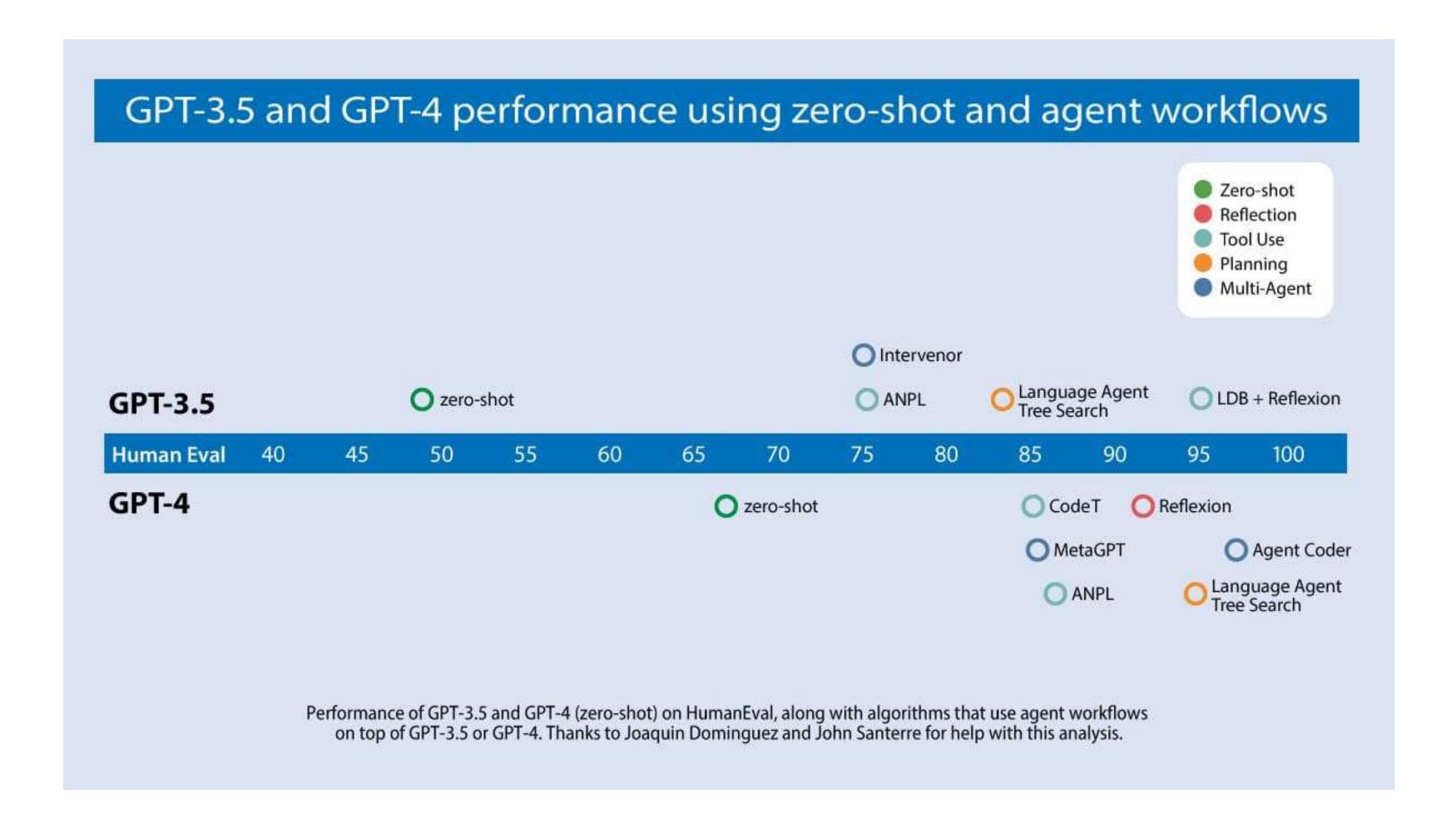
# What is an AI Agent?



"I think AI agent workflows will drive massive AI progress this year — perhaps even more than the next generation of foundation models. This is an important trend, and I urge everyone who works in AI to pay attention to it."

Andrew Ng, AI Fund, Stanford

## Agent on gpt-3.5 > gpt-4.5



"Compared to training methods, OpenAI is currently paying more attention to the changes in the Agent domain. Whenever new AI Agents papers come out, there is excitement within the organization, and serious discussions take place"

Andrej Karpathy, ex-Open AI, ex-Tesla

# What's possible?

## Feel - Think - Act

see hear

fast slow

online offline

see

MS School N2 D3 1 Decentralized country Curreny

#### Top Line:

"NS School v2 D..." (the last character looks like { or } )

#### 1) "Decentralized country?"

- · In a circle or bubble:
  - "What is? country -> to people? currency? Army? legal [loc?]"
- Another note nearby:
  - "private property? data? [taxation?]"
  - "physical borders, diplomatic recognition"

#### Below that:

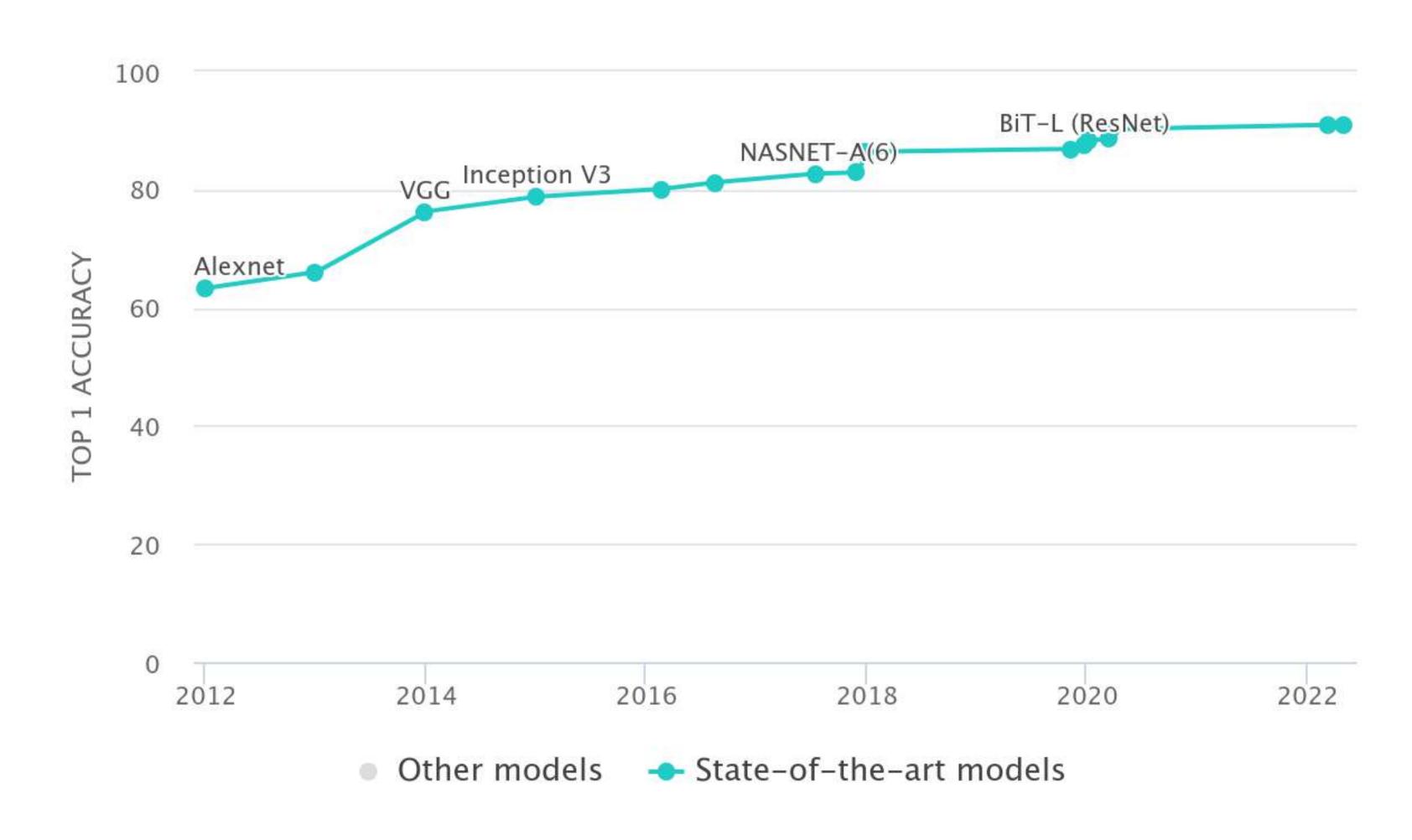
- ".tv -> godaddy"
- ".tm -> ??"

Large oval labeled: "I Why"

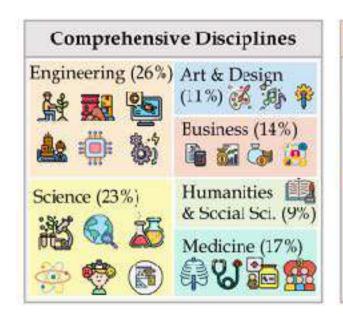
"people, preferable? profitable?"

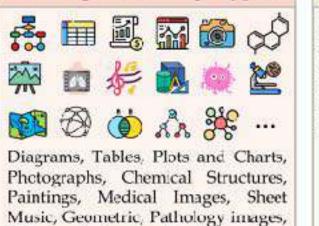
## Image Recognition

### Above human level



## On par with human experts





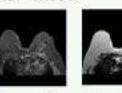
Microscopic Images, Comics, ...

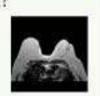
Heterogeneous Image Types

#### Interleaved Text and Images

Question: You are shown subtraction ≤image 1>, T2 weighted <image 2> and T1 weighted axial <image 3> from a screening breast MRI. What is the etiology of the finding in the left breast?



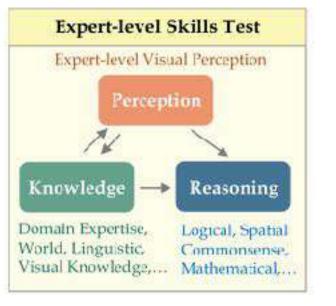








<image 1> <mage 2> <image 3>

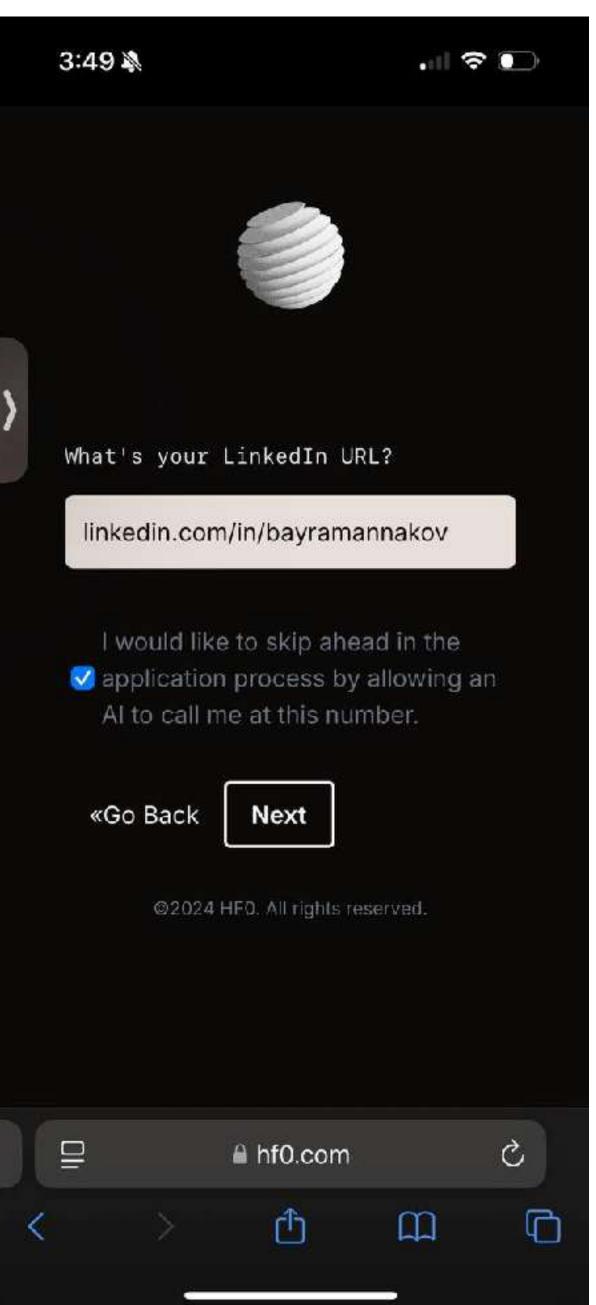


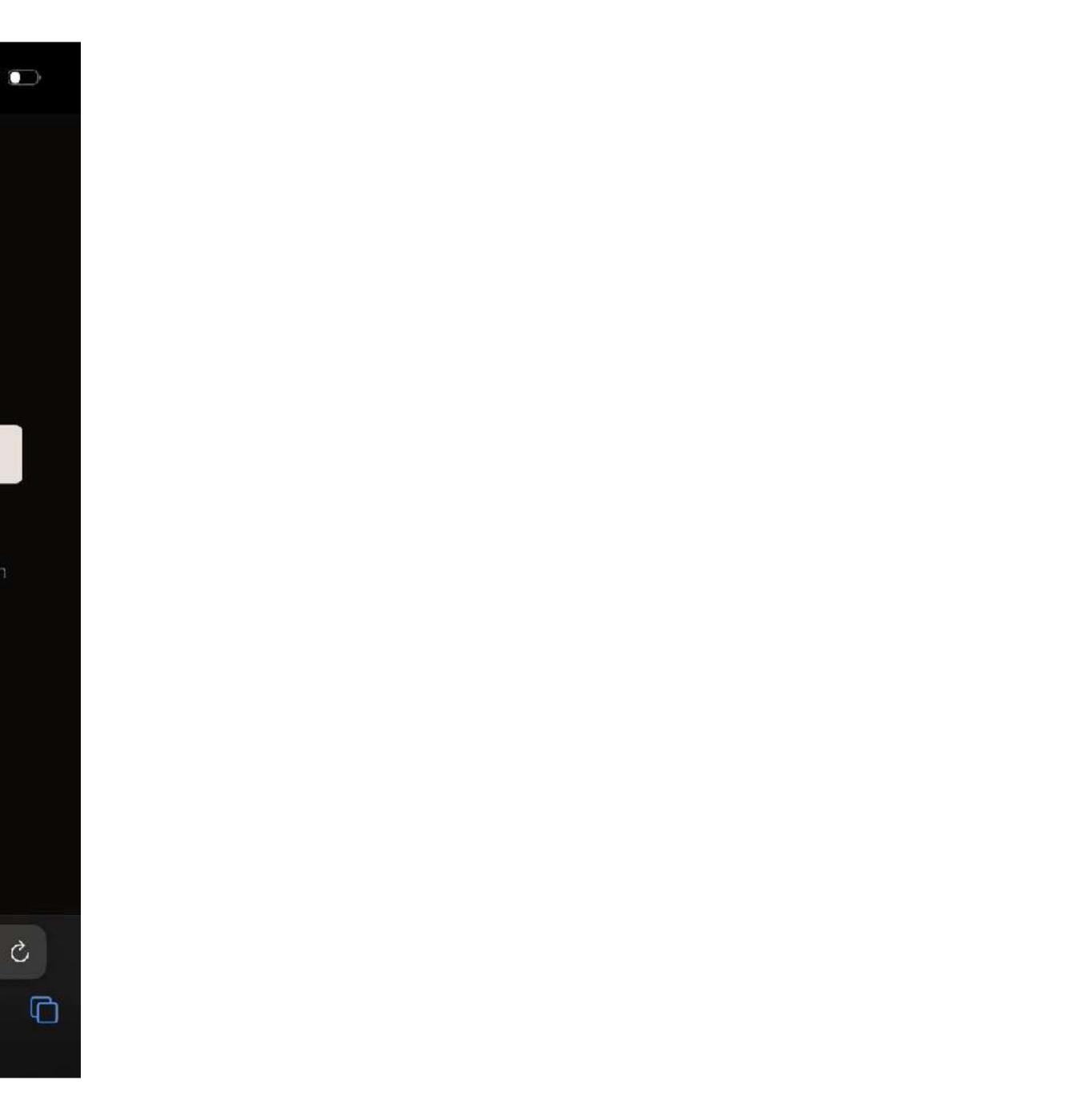
	Reset		MMMU-Pro	MMMU(Val)	MMMU(Test)
Name	Size	Date	Overall	Overall	Overall
Human Expert (High)	181	2024-01-31		88.6	18
luman Expert (Medium)	-	2024-01-31		82.6	
01		2024-09-12		78.2*	*
Human Expert (Low)		2024-01-31	S±8	76.2	3
SPT-4.5	E	2025-02-28	(*)	74.4*	*
Semini 2,0 Pro		2025-02-05	500	72.74	*
Semini 2:0 Flash	8	2025-02-05		71.7*	~
park4.0-Turbo	6.5	2025-01-22		70.4*	60.3*
QVQ-72B-Preview	72B	2024-12-25		70.3*	*
nternVL2.5-78B	788	2024-12-05	48.5*	70.1*	61.8*
SPT-40 (0513)		2024-05-13	51.9	69.1*	¥
Claude 3.5 Sonnet	₽:	2024-06-20	51.5	68.3	3
Semini 2.0 Flash-Lite	-	2025-02-05	(4)	68.0*	*
Semini 1.5 Pro (0801)	TE	2024-08-01	46,9	65.8	3
Qwen2-VL-72B	728	2024-08-29	46.2	64.5	¥
nternVL2.5-38B	388	2024-12-05	46.0*	63.9*	57.6*
Gemini 1,5 Pro (0523)	18	2024-05-23	43.5	62.2*	2
nternVL2-Pro		2024-07-04		62.0*	55.7
FeleMM	12	2024-11-18		61.4*	58.2*
Jama 3.2 908	908	2024-09-25	39.5*	60.3*	
VVLM-H 1.0 788	760	2024-09-17	6.50	60.2*	53.0*

# 

hear







## Speech Transcription

#### **Word Error Rate**

Word error rate: % of words transcribed incorrectly, Lower is better



### **B2B AI Voice Agents - Early Wedges**



#### After-hours/overflow calls

These are calls that would otherwise go to voicemail.

At the very least, a voice agent can collect (or share) more information and arrange a human callback.

More interestingly, a voice agent may even be able to complete a booking or transaction with the customer — especially if it plugs into scheduling software, a CRM, etc.



#### **Net-new outbound calls**

These are calls that would have been uneconomical to perform before AI — any results (above costs) are essentially "free money"!

This can be customer check calls, activation calls, lead calls, etc.

This does not require deep integration — customers can send a spreadsheet of phone numbers to get started.



#### Back office calls

Businesses spend real labor time on calls that aren't customer-facing, but to other businesses where you may get stuck on hold.

One example of this is healthcare clinics, who make calls to pharmacies, insurers, and suppliers.

These are "lower stakes" —
and valuable even if the
voice agent just navigates
through an IVR and
transfers to a human.



#### "Low incentive" calls

As opposed to human agents, voice agents are motivated to do (and do a good job with) all call types - including calls where they don't make a commission.

This is also true for calls
that might be stressful to
perform. One example
here is negotiations, where
the human agent may be
tempted to "give in" and
offer their best price or
offer immediately.

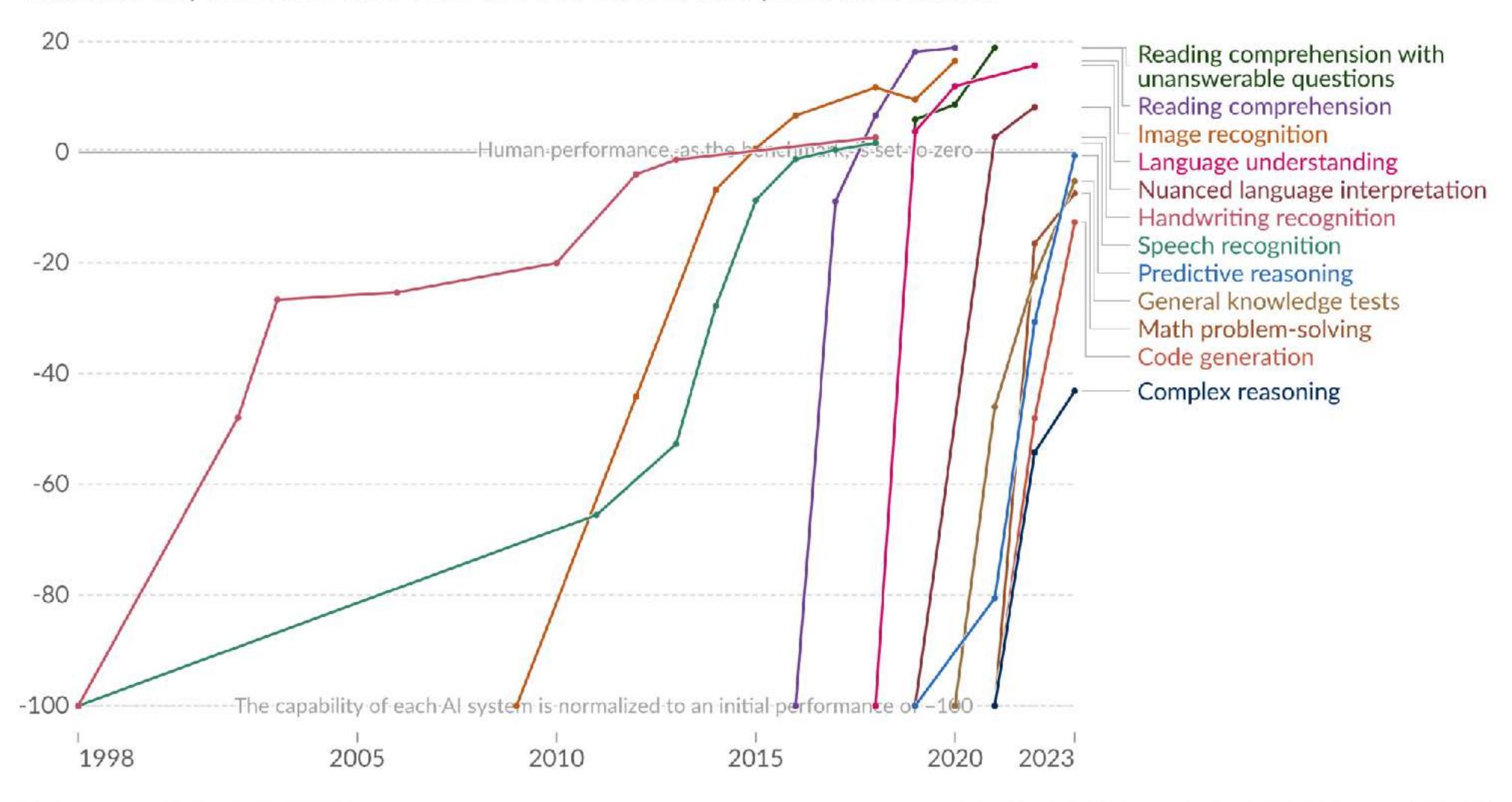
# Think

fast

## Test scores of AI systems on various capabilities relative to human performance



Within each domain, the initial performance of the AI is set to -100. Human performance is used as a baseline, set to zero. When the AI's performance crosses the zero line, it scored more points than humans.



Data source: Kiela et al. (2023)

OurWorldInData.org/artificial-intelligence | CC BY

Note: For each capability, the first year always shows a baseline of -100, even if better performance was recorded later that year.

### **IQ Test Results**

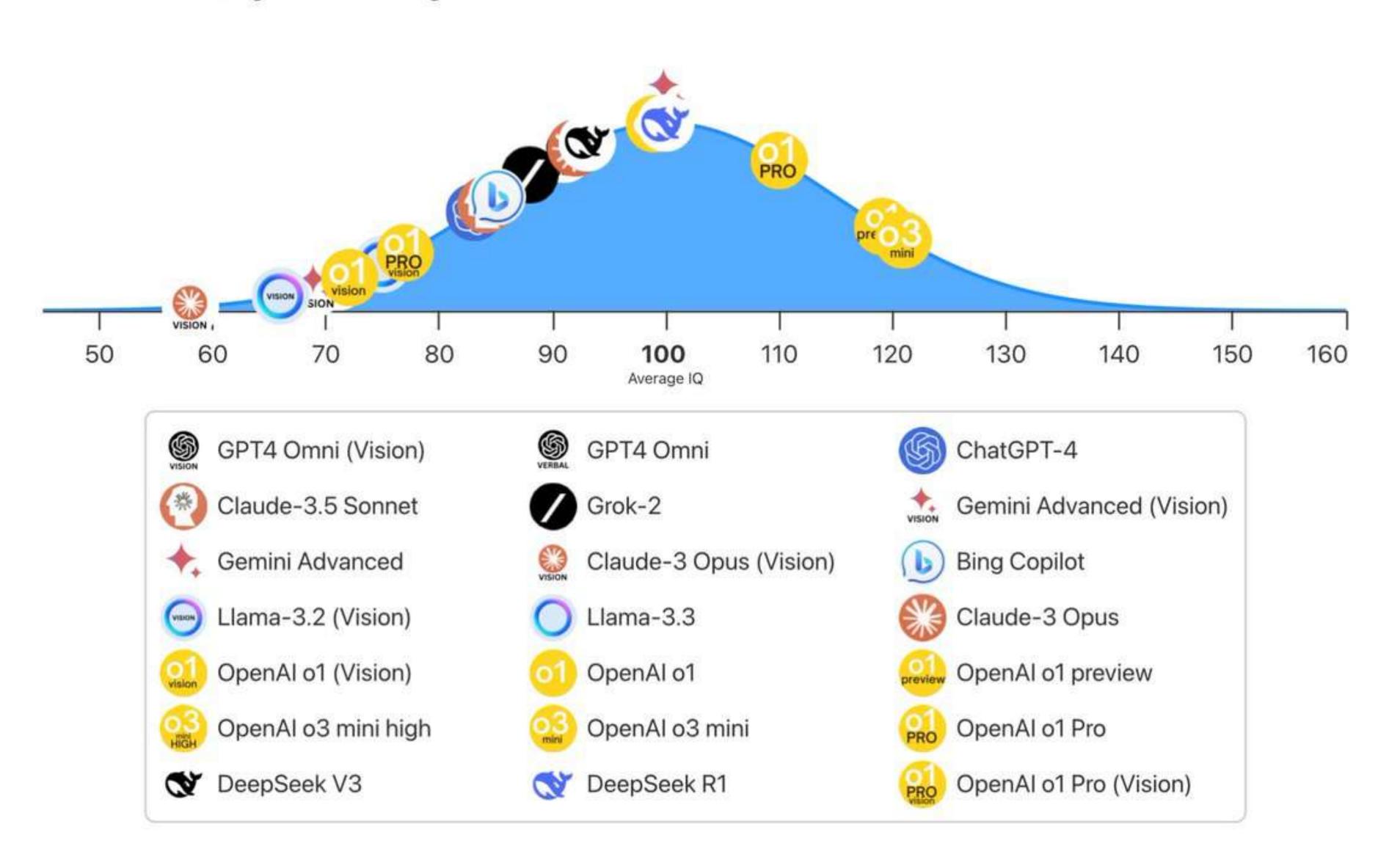


**Show Offline Test** 

Show Mensa Norway



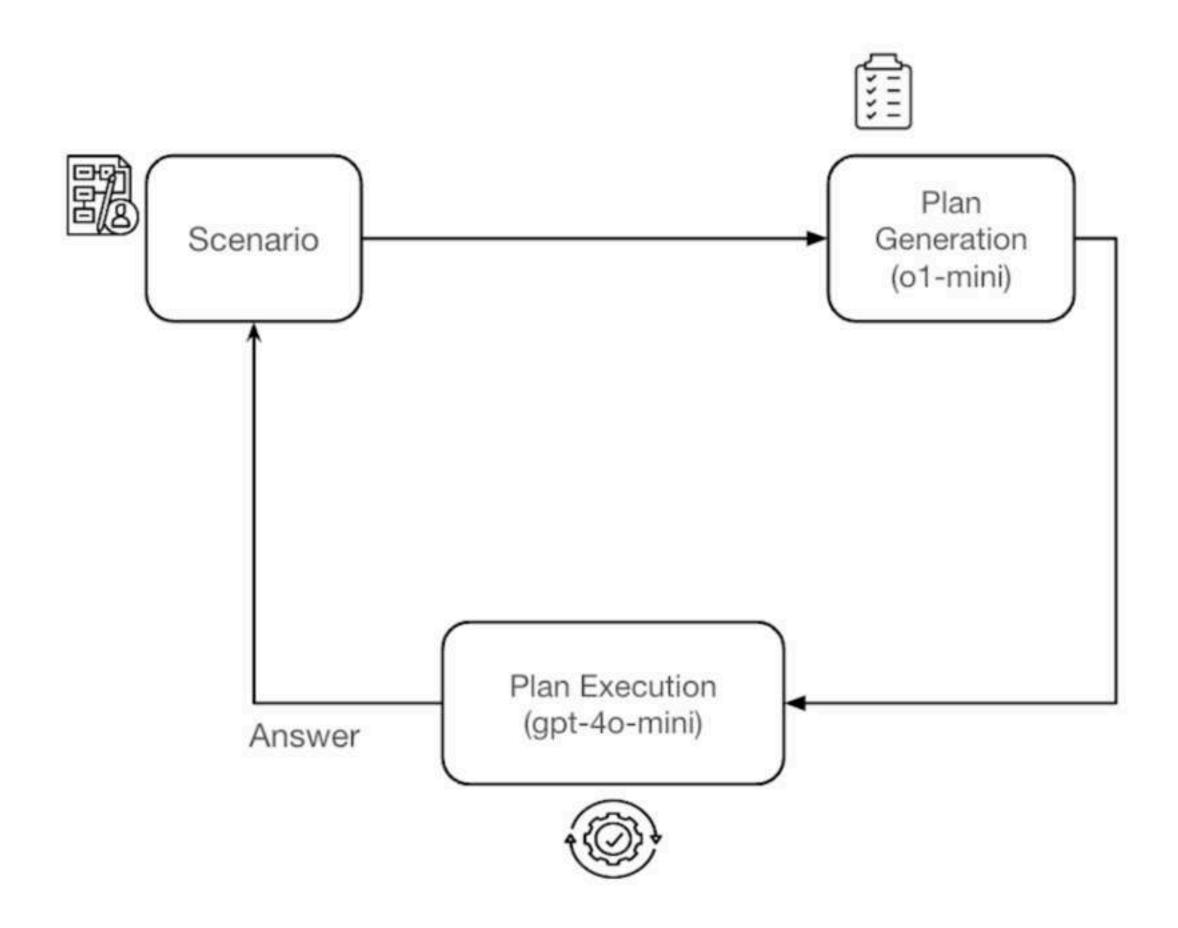
Score reflects average of last 7 tests given





slow

## o1 to plan, 40 to execute



#### PLAN:

- 1) Use "seed" companies to discover similar businesses
- Since we already have examples (<redacted: list of customer's customers>), we will use them as "seed" companies.
- For each seed company, examine their domain and use find\_similar\_companies\_exa(domain, num\_results) to find companies that match or resemble their business model.
- Gather a broad list of potential subscription-based companies
- Perform robust Google queries (search\_google) with keywords such as:
- "subscription-based ecommerce companies"
- "direct-to-consumer subscriptions physical products"
- "DTC subscription box companies"
- Similarly, use search\_exa(query, num\_results) to find more companies that mention "subscription box," "subscription service," and other related terms.
- 3) Capture company details to confirm they meet the criteria
- From search results, collect potential company LinkedIn
   IRLs
- For each LinkedIn URL, use get\_company\_info(company\_linkedin\_url) to retrieve company size, industry, headquarters, and other metadata.
- 4) Filter companies based on the project's criteria
- a) Must have a subscription-based revenue model
- Verify by checking company descriptions or known business type (e.g., listing or press mentions of subscriptions, repeated purchases, etc.).
- b) Must sell physical products
- Confirm via company website or LinkedIn descriptions indicating product shipments, physical goods, etc.
- c) Must be direct-to-consumer (DTC)
- Confirm from descriptions, press news, or LinkedIn.

d) Must have 50+ employees

I'll get back to you with the latest SOTA results and upcoming advancements.

Research completed in 6m · 28 sources

### Al Agent Performance Benchmarks (Latest **SOTA Metrics)**

This overview covers state-of-the-art (SOTA) performance metrics for AI agents across three major capability areas: Feeling (Seeing & Hearing), Thinking (Fast & Slow), and Acting (Online & Offline). We provide the latest benchmarks, models, and references in each category, highlighting multimodal perception, reasoning performance, and action-taking capabilities.

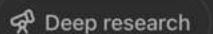
#### 1. Feeling (Seeing & Hearing)

Multimodal Vision Models: Recent multimodal models, such as OpenAl's GPT-4V (GPT-4 Vision) and Google DeepMind's Gemini, demonstrate advanced image and video understanding. For example, GPT-4V achieves strong performance on visual percept₁ \$\square\$ benchmarks. OpenAl's newest **GPT-40** vision

Ask anything













(S) I'm gathering the latest Al agent benchmarks across "Feeling," "Thinking," and "Acting." This involves multimodal models, fast and slow reasoning tasks, and online/offline actiontaking capabilities.

I'm focusing on integrated models like GPT-4's image understanding, while also considering foundation models like CLIP for a more comprehensive benchmark of image and video recognition.

- [>-] Analyzed with python
- Q Searched for GPT-4 Vision performance benchmarks
- I'm looking at GPT-4 Vision's performance on vision benchmarks, comparing it to LLaVA. This involves multimodal model benchmarks for image and video recognition.
- [>-] Analyzed with python
- K Read arxiv.org
- (S) I'm compiling evaluations and benchmarks for GPT-4V, Gemini, and Claude with vision on image, video recognition, and multi-modal

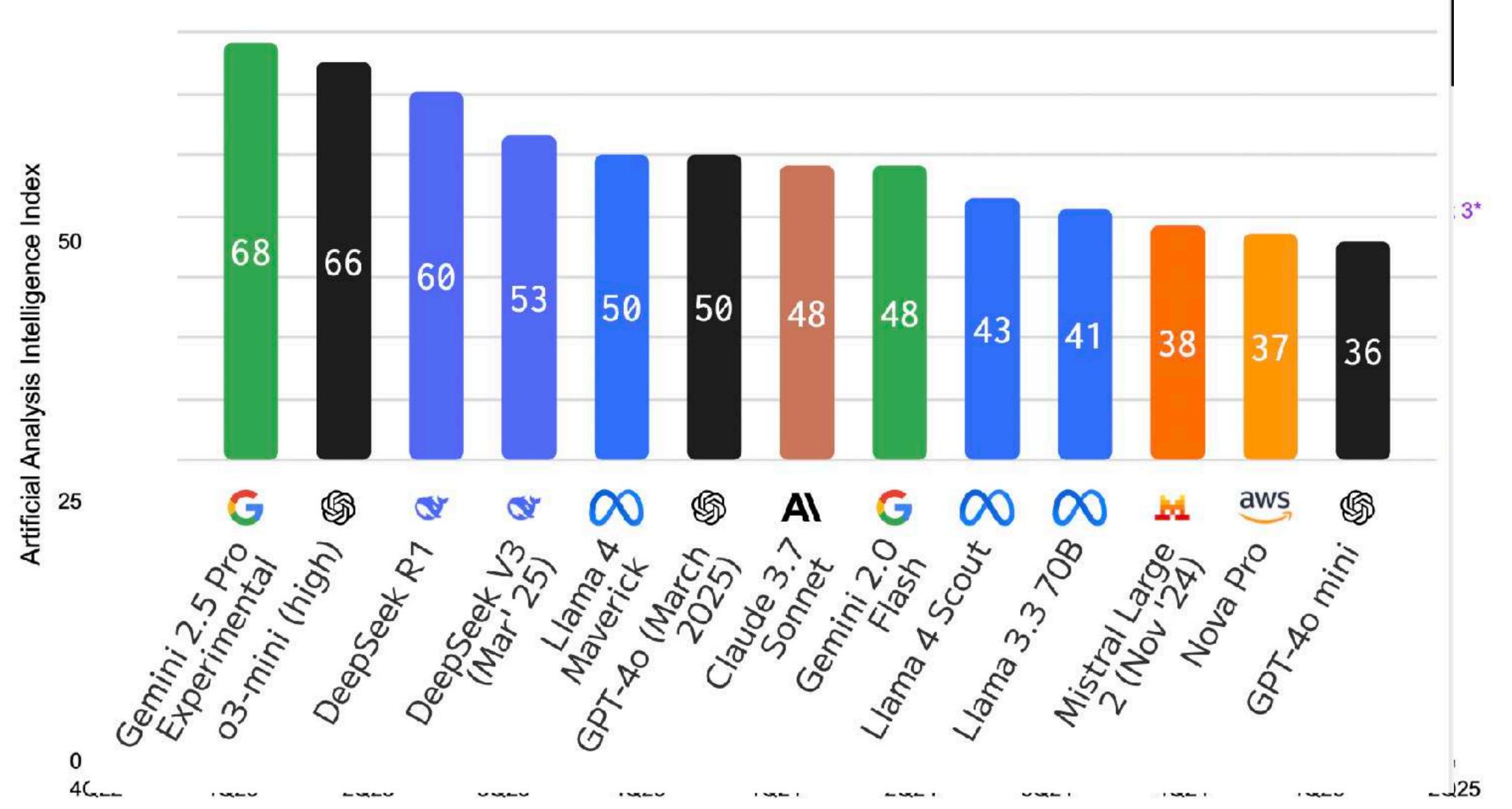
Froi

Artificial

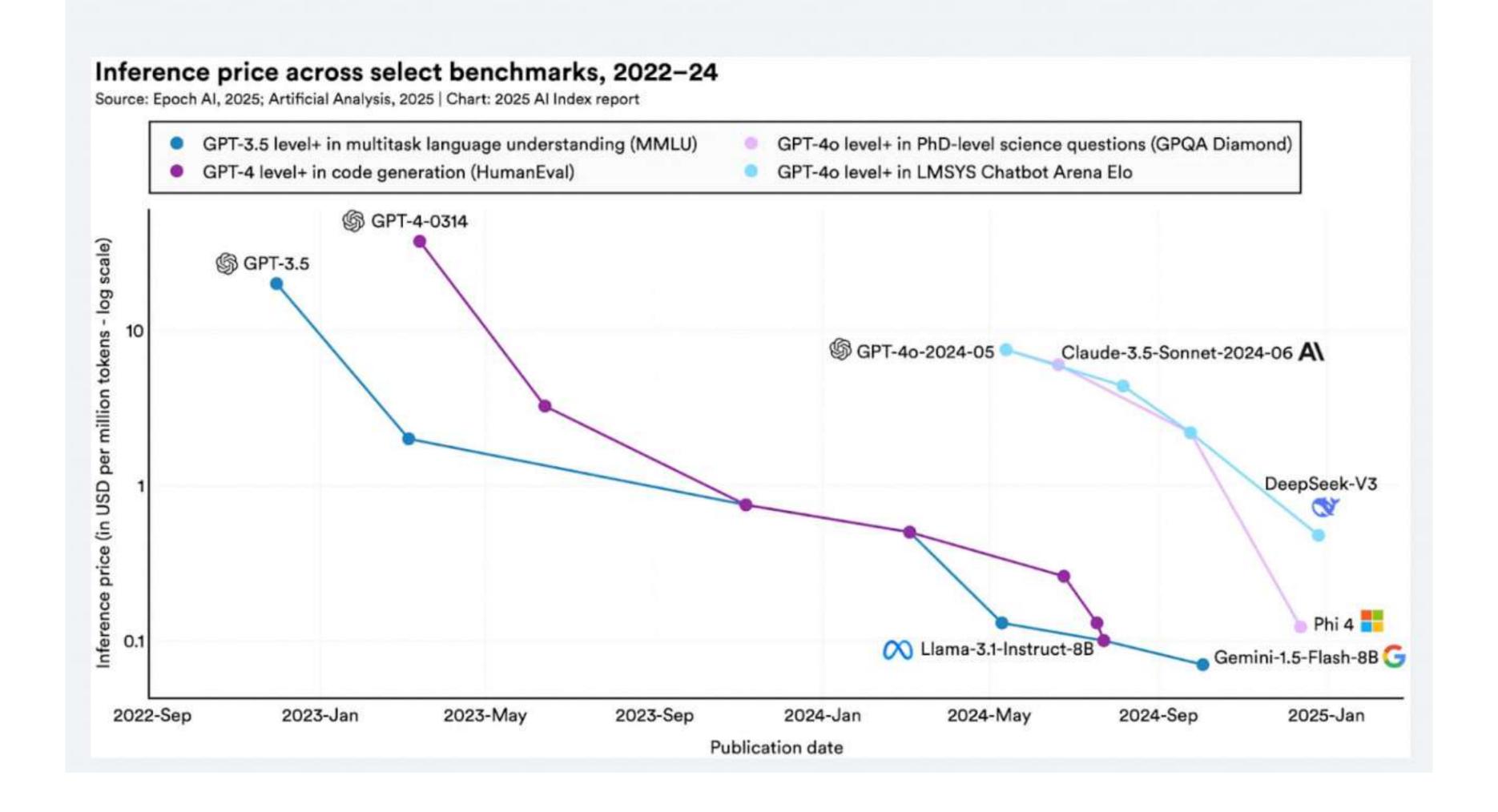
Intellige

### INTELLIGENCE

75 Artificial Analysis Intelligence Index; Higher is better



### Models Become Cheaper to Use



#### Examples 1-2/8



#### **□** 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<sup>o</sup> BT ḤRY BR <sup>c</sup>T<sup>o</sup> ḤBL

吕 Henry T

Merton College, Oxford

#### **□** Ecology

#### Question:

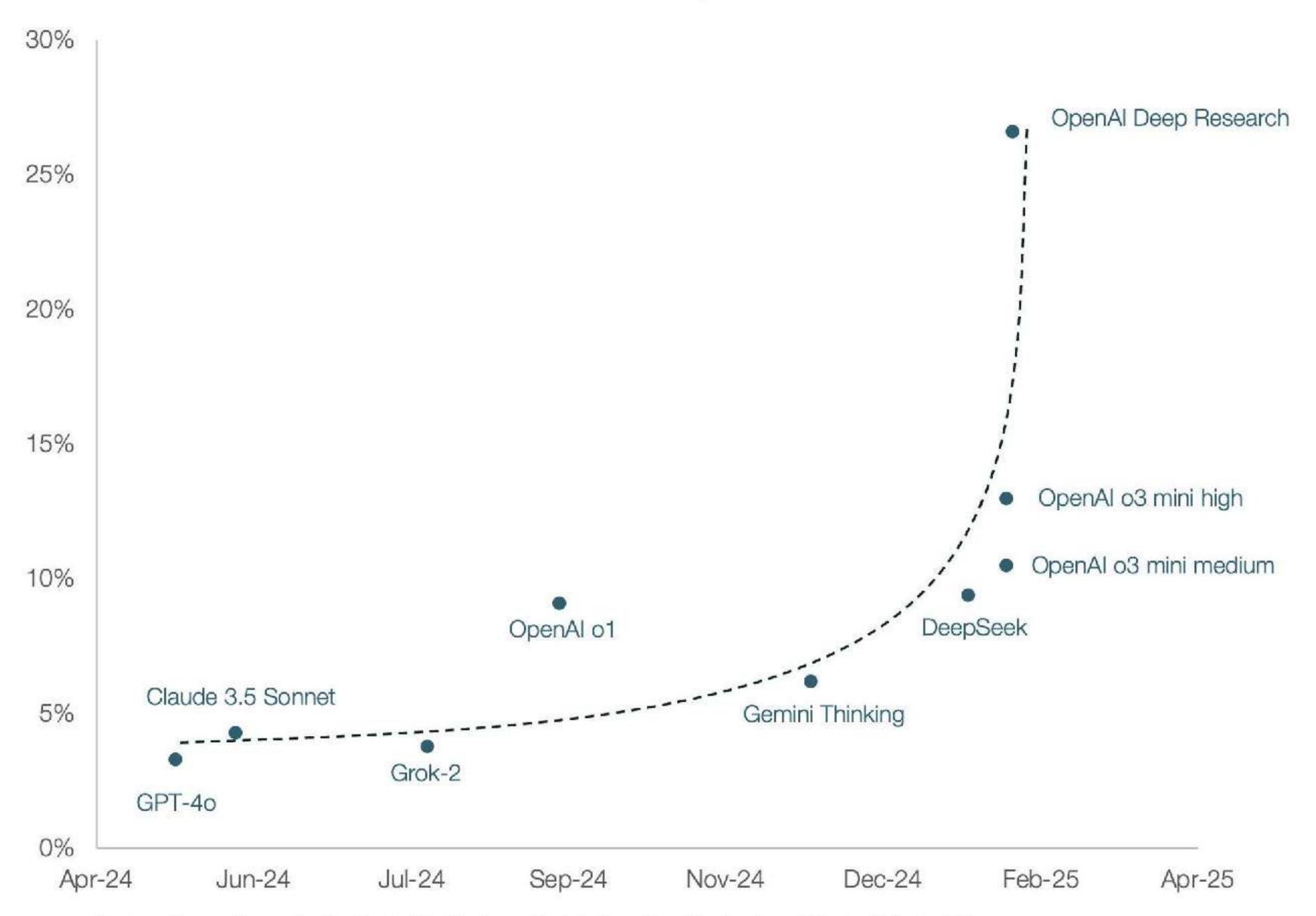
Hummingbirds within Apodiformes uniquely have a bilaterally paired oval bone, a sesamoid embedded in the caudolateral portion of the expanded, cruciate aponeurosis of insertion of m. depressor caudae. How many paired tendons are supported by this sesamoid bone? Answer with a number.

은 Edward V

Massachusetts Institute of Technology

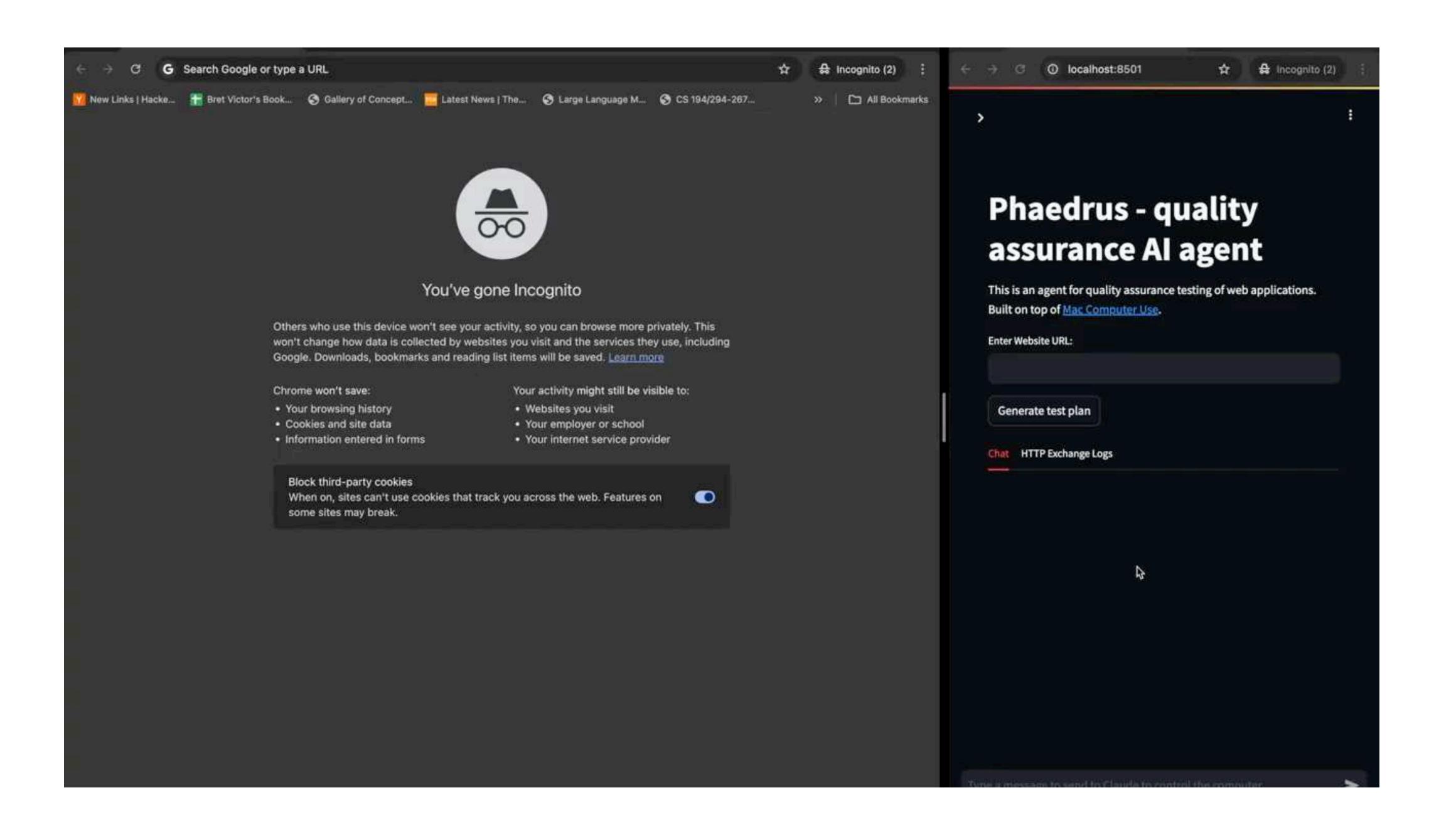
Samples of the diverse and challenging questions submitted to Humanity's Last Exam.

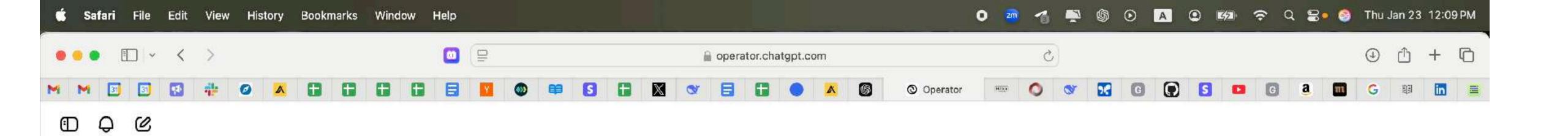
### Al Scores on Humanity's Last Exam



Source: Tomas Pueyo for Uncharted Territories, with data from Dan Hendrycks, of Humanity's Last Exam

online





### Operator

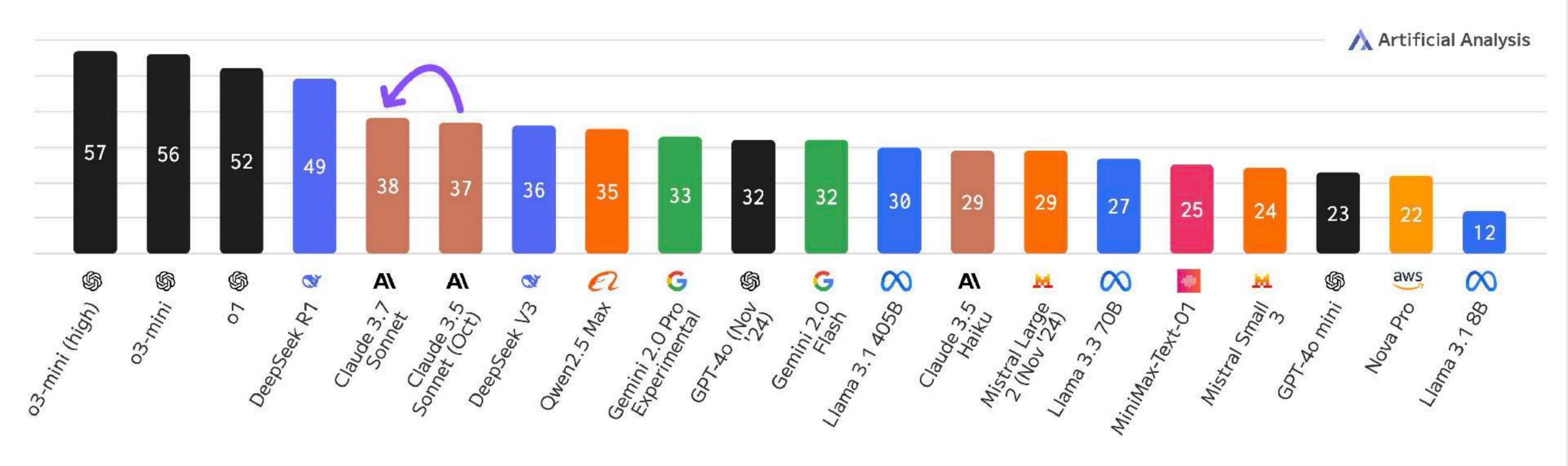


156	= ymmparsa	81 2751
.57	■ RDDCCD	51 2749
58	green_gold_dog	47 2748
59	<b>H</b> Tlatoani	126 2747
.60	■ Noam527	144 2746
.60	⊩ KevinWan	123 2746
60	■ Wuyanru	37 2746
63	■ fengqiyuka	27 2745
64	CJ-zhuyifan	34 2744
65	■ E869120	36 2738
65	■ Xylenox	141 2738
65	Chinese_zjc_	49 2738
68	■ sevili777	210 2736
68	■ kshitij_sodani	121 2736
70	■ Mangooste	65 2733
70	zhaohaikun	71 2733
72	■ DPprince	12 2731
73	■ lexiyvv	143 2729
74	Dominater069	70 2728
75	■ RanRankeainie	10 2727
76	■ LeoPro	115 2726
77	■ PersistentLife	56 2725
78	■ dreamoon_love_AA	375 2724
78	■ wwwwodddd	20 2724
80	• physics0523	226 2722
80	■ umbrella-leaf	36 2722
82	■ BigBag	278 2720
82	Nutella3000-7	10 2720
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37	■ teraqqq	29 2715
88	sansen	157 2713

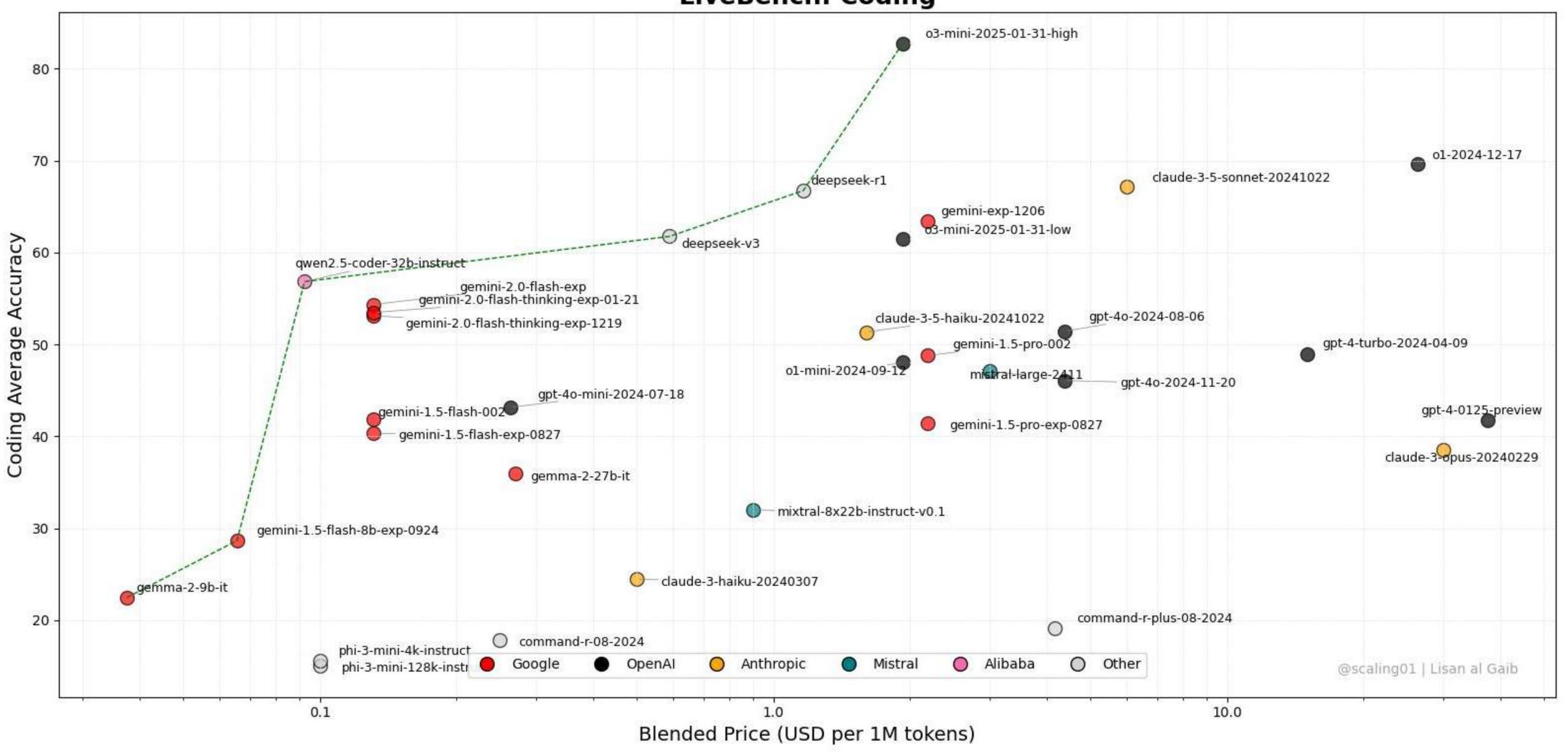
39	■ QAQAUTOMATON	/4 311.
40	• noimi	202 310
40	■ StarSilk	66 310
42	■ kiwihadron	15 3089
43	antontrygubO_o	168 308
44	m hank55663	260 307
44	= errorgorn	51 307
46	JoesSR	21 307
47	meal neal	155 305
48	■ skip2004	30 305
49	353cerega	89 304
50	■ liuhengxi	33 304
51	dog_of_Nesraychan	24 303
52	= peti1234	107 302
53	■ 275307894a	54 302
54	= Endagorion	255 302
55	m hyman00	60 302
56	= jeroenodb	90 301
57	femboy-wannabe	11 301
58	Licha06	25 301
59	• rin204	123 301
60	-Eternity-	19 3004
61	■ jiangbowen	65 299
62	= PFIMUDA	37 299

### Artificial Analysis Coding Index

Represents the average of coding benchmarks in the Artificial Analysis Intelligence Index (LiveCodeBench & SciCode)

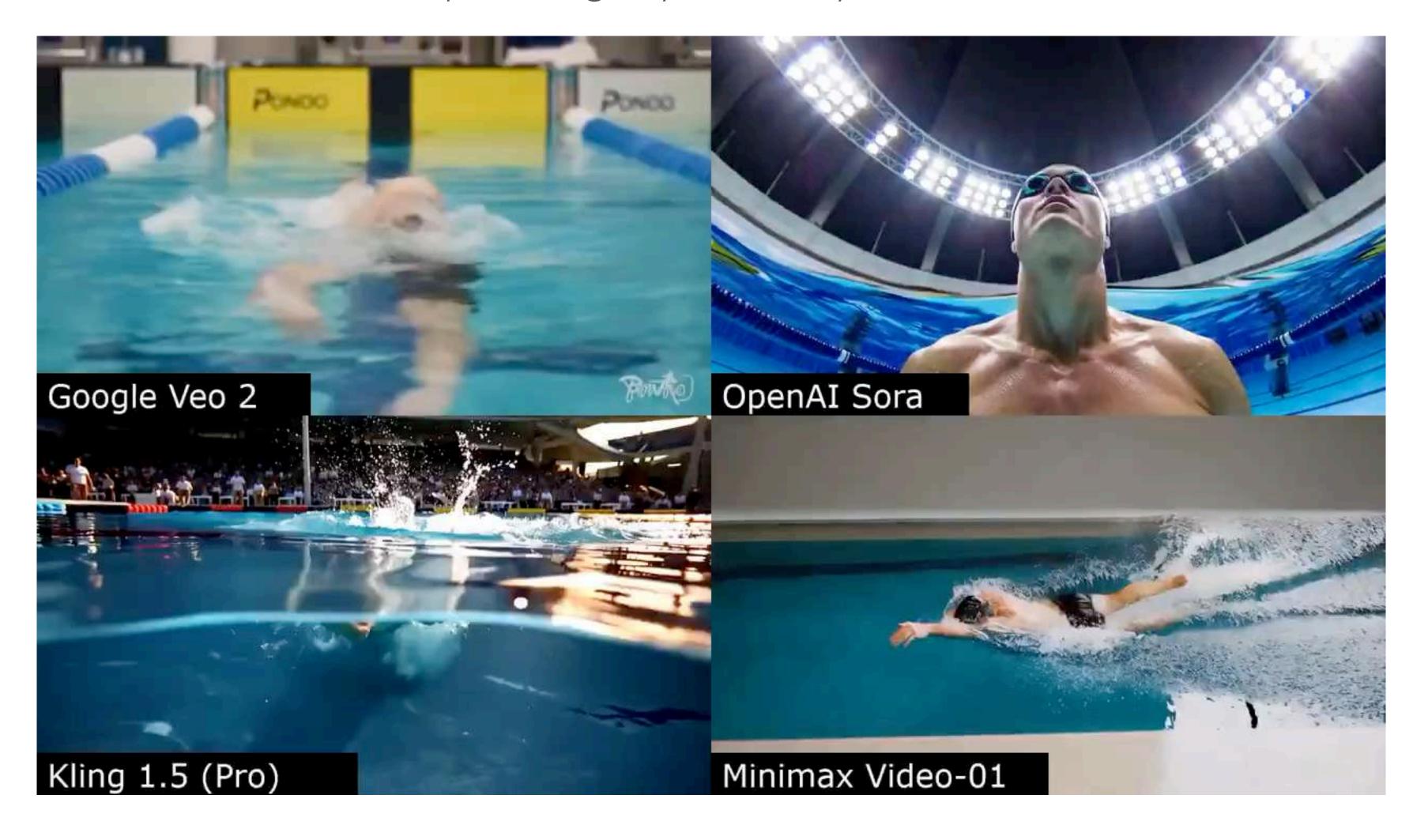


LiveBench: Coding





A swimmer in his early 30s dives into the water, the view shifting between above and below as he powers through the race, water splashing rhythmically with each stroke.

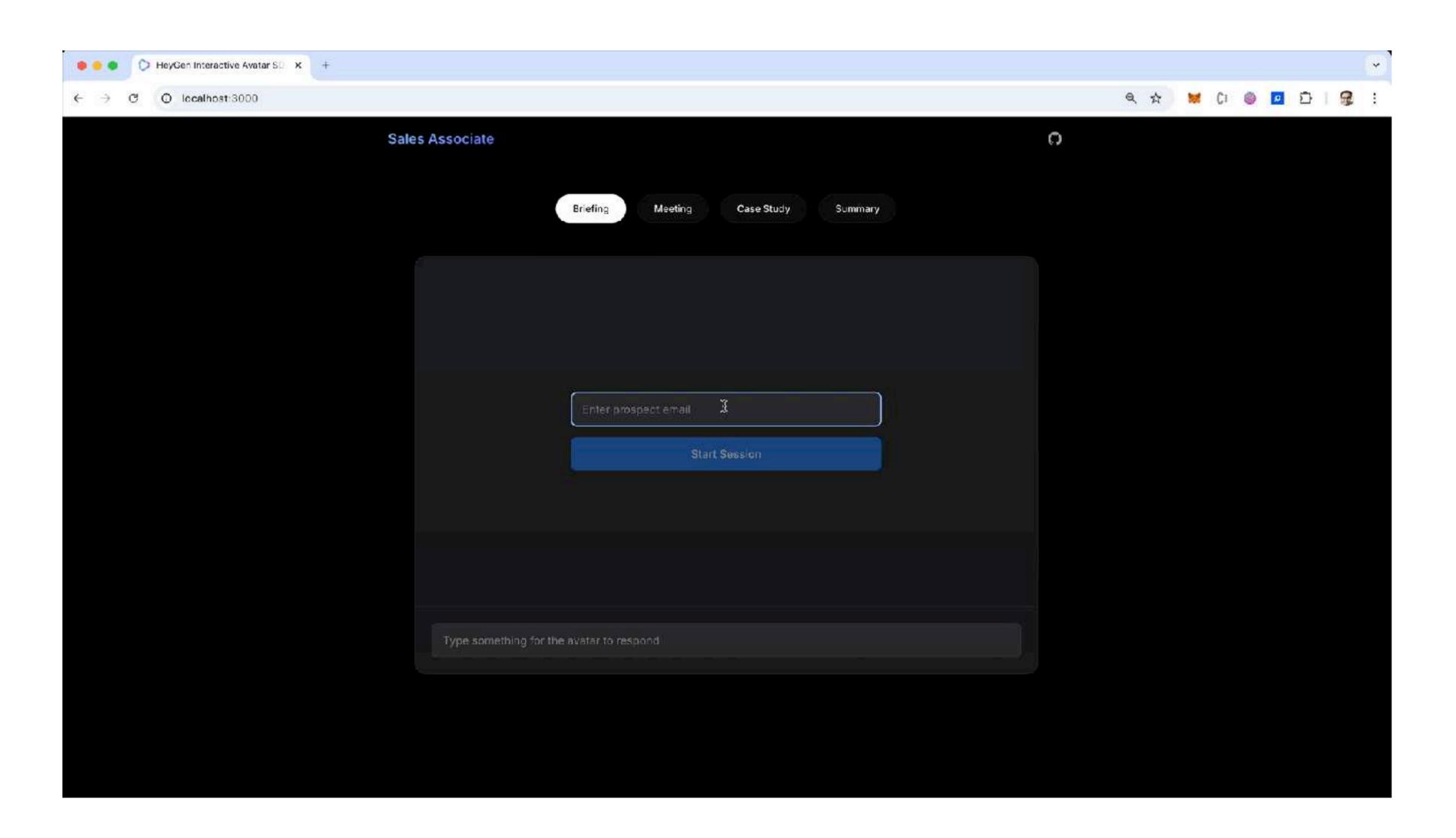




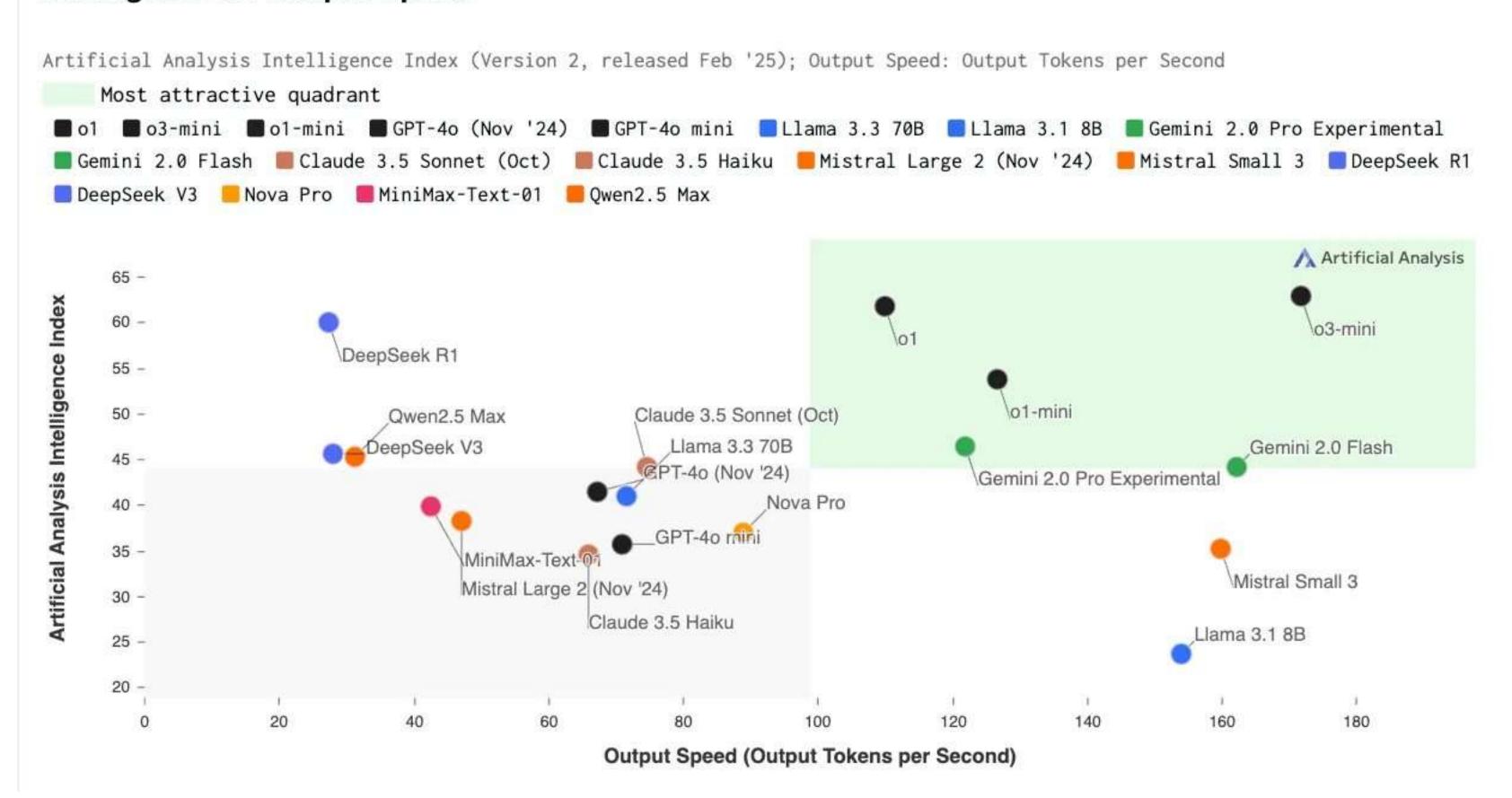
#### ARTIFICIAL ANALYSIS VIDEO GENERATION ARENA LEADERBOARD

CREATOR	NAME	ARENA ELO	# APPEARANCES
G Google	Google Veo 2	1124	368
<b>%</b> Kuaishou	Kling 1.5 (Pro)	1091	75,112
⑤ OpenAl	OpenAl Sora	1089	93,498
MiniMax	Minimax Video-01	1078	120,430
Pika Art	Pika 2.0	1073	54,366
<b>%</b> Kuaishou	Kling 1.6 (Standard)	1067	26,340
Genmo	Mochi 1	1040	119,162
Tencent Tencent	Hunyuan Video	1037	67,988
<b>₨</b> Runway	Runway Gen 3 Alpha	1029	145,756

## Video Agents



#### Intelligence vs. Output Speed



offline





# What's coming?

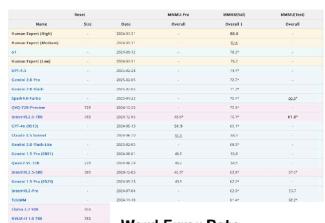
## Feel



hear see

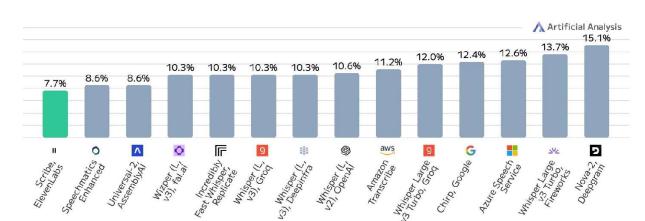
fast slow

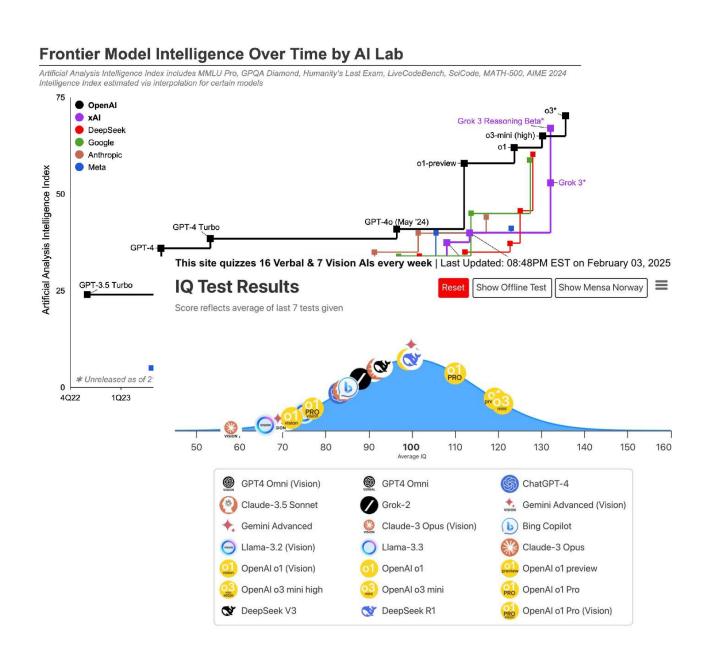
online offline

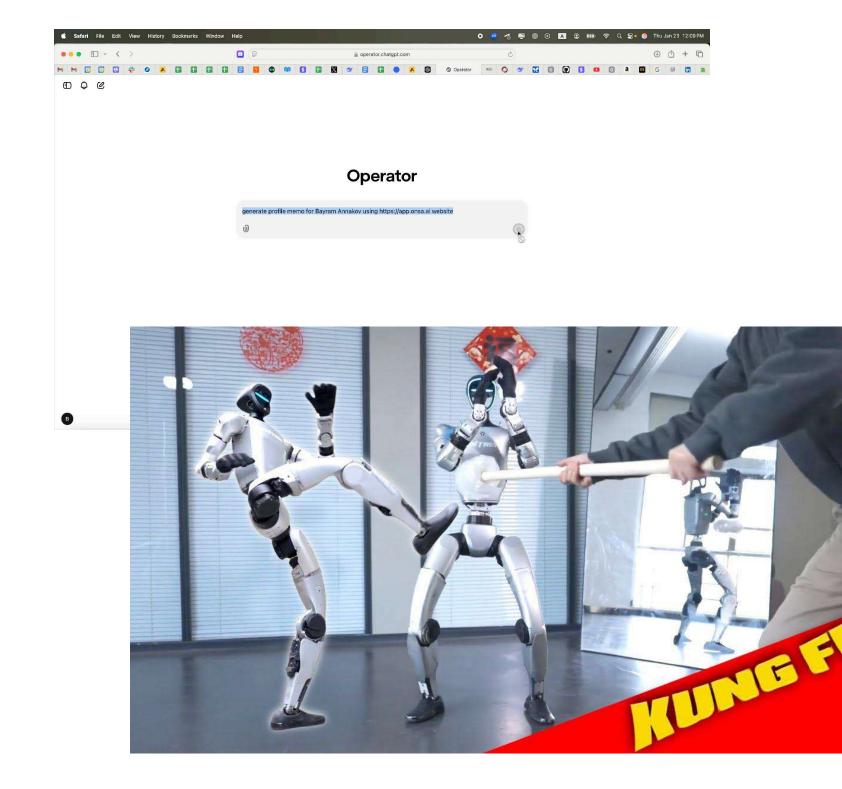


**Word Error Rate** 

Word error rate: % of words transcribed incorrectly, Lower is better



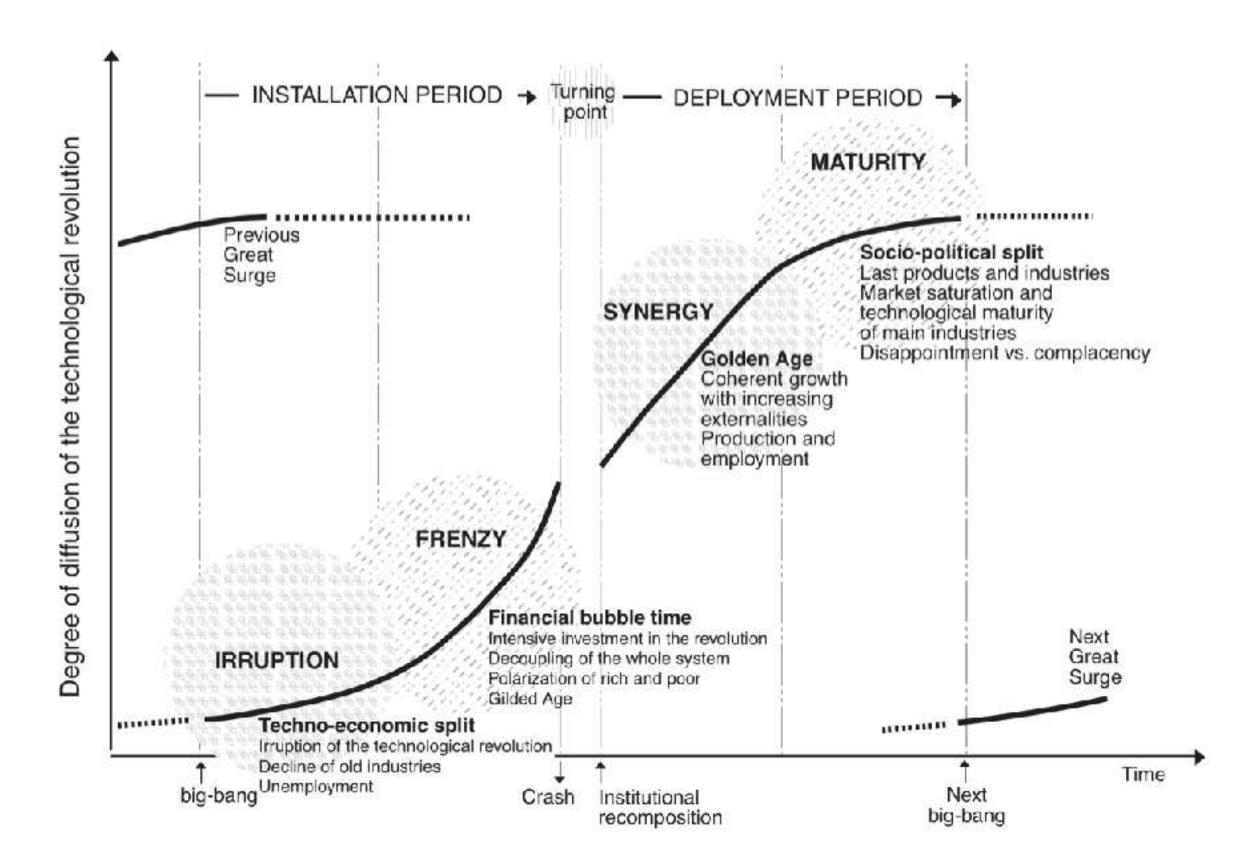




## Tech Revolutions & Financial Capital

#### Perspective

Figure 5.1 Recurring phases of each great surge in the core countries

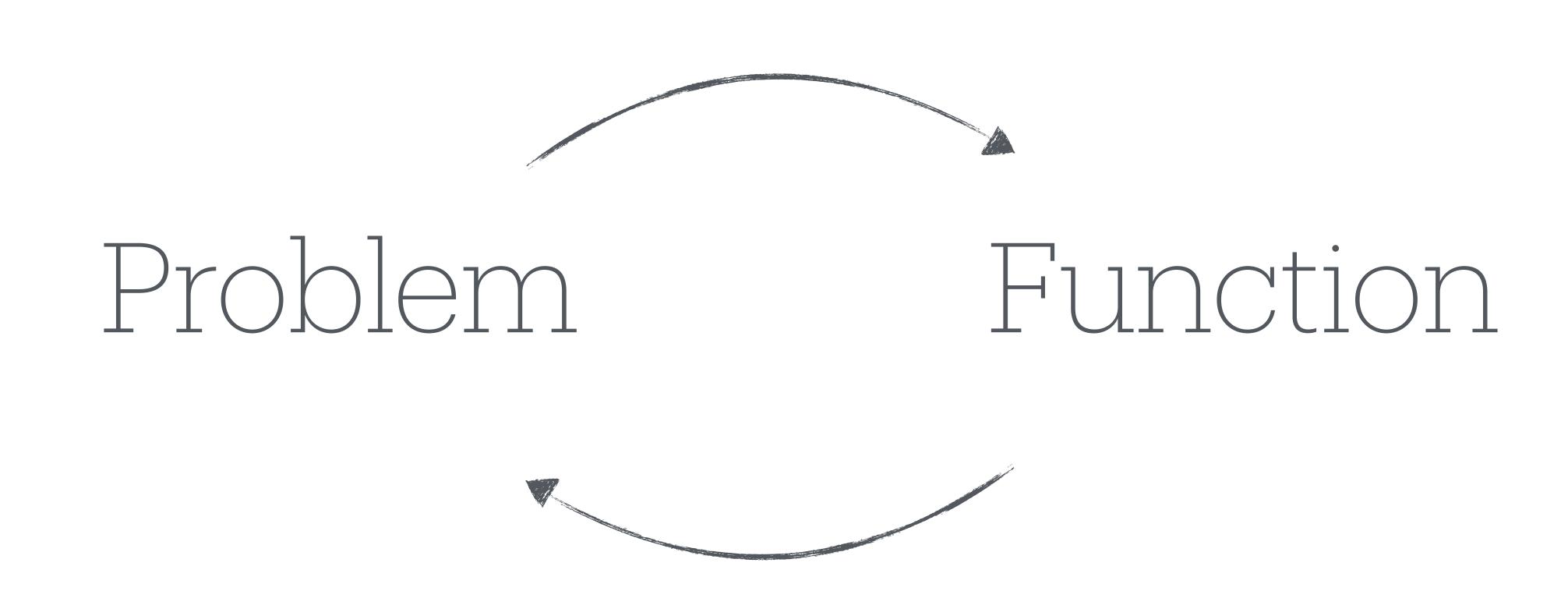


## Frenzy?

## Al's \$600B Question

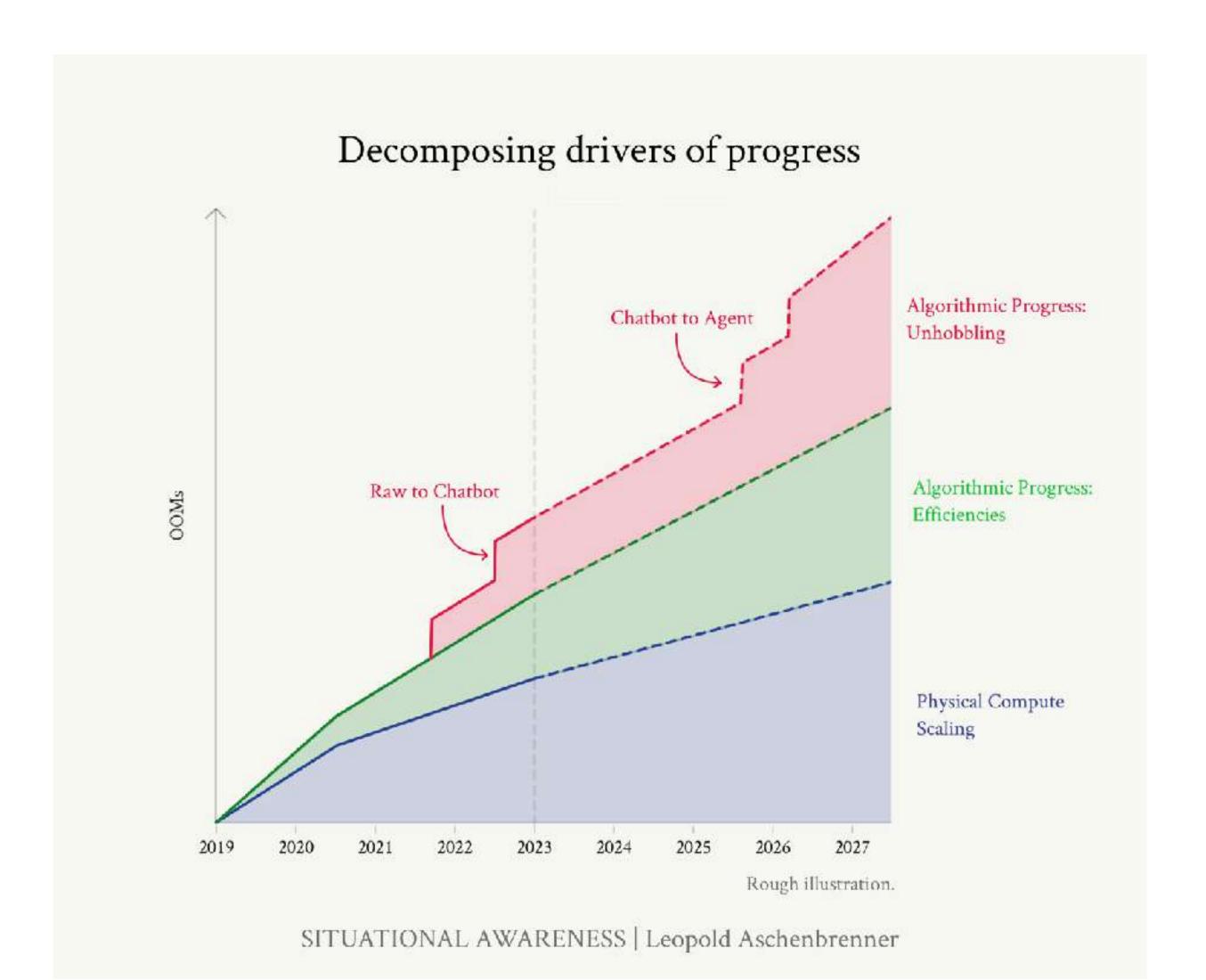
The AI bubble is reaching a tipping point. Navigating what comes next will be essential.

BY <u>DAVID CAHN</u> PUBLISHED JUNE 20, 2024

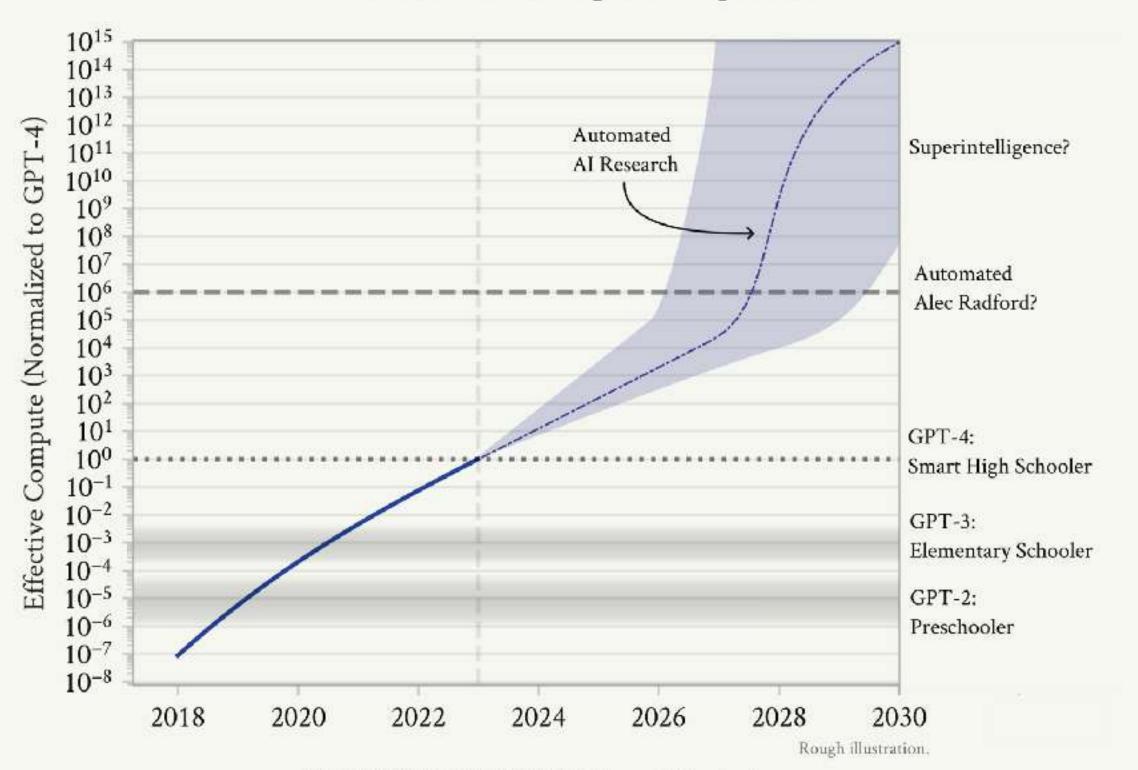


#### Situational Awareness

#### Perspective

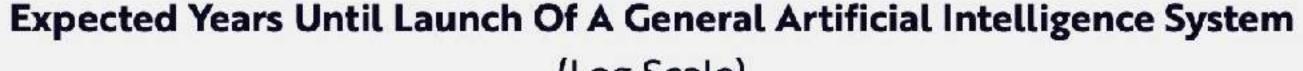


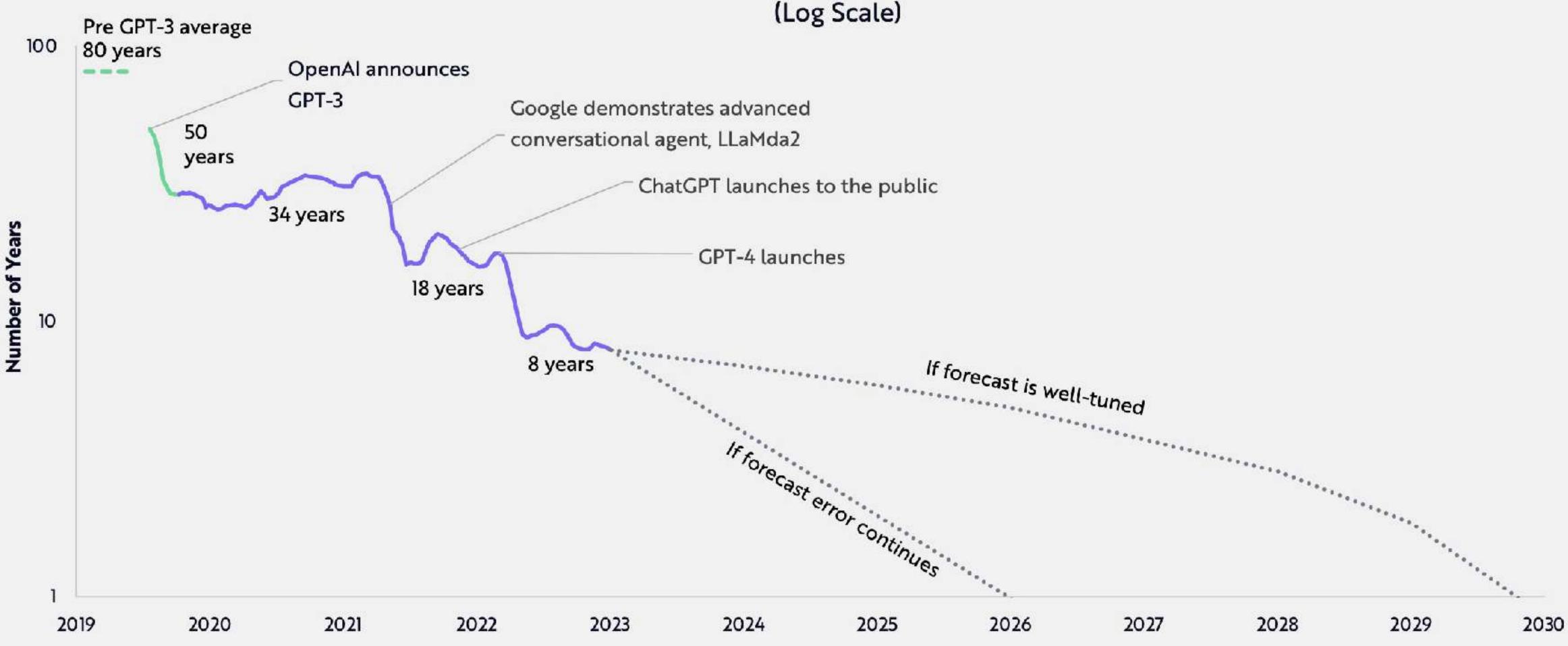
#### Scenario: Intelligence Explosion



SITUATIONAL AWARENESS | Leopold Aschenbrenner

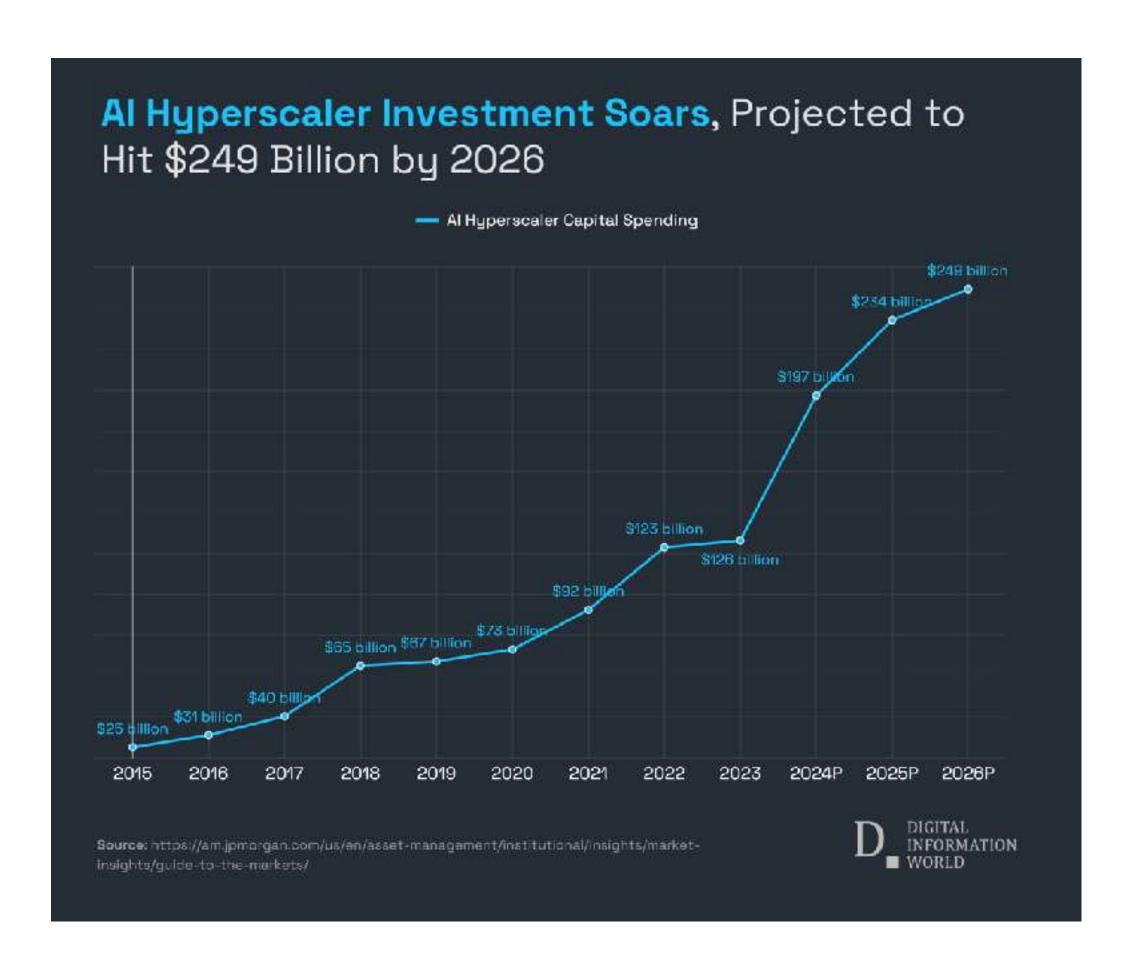
#### Al Is Accelerating Faster Than Forecasters Anticipated





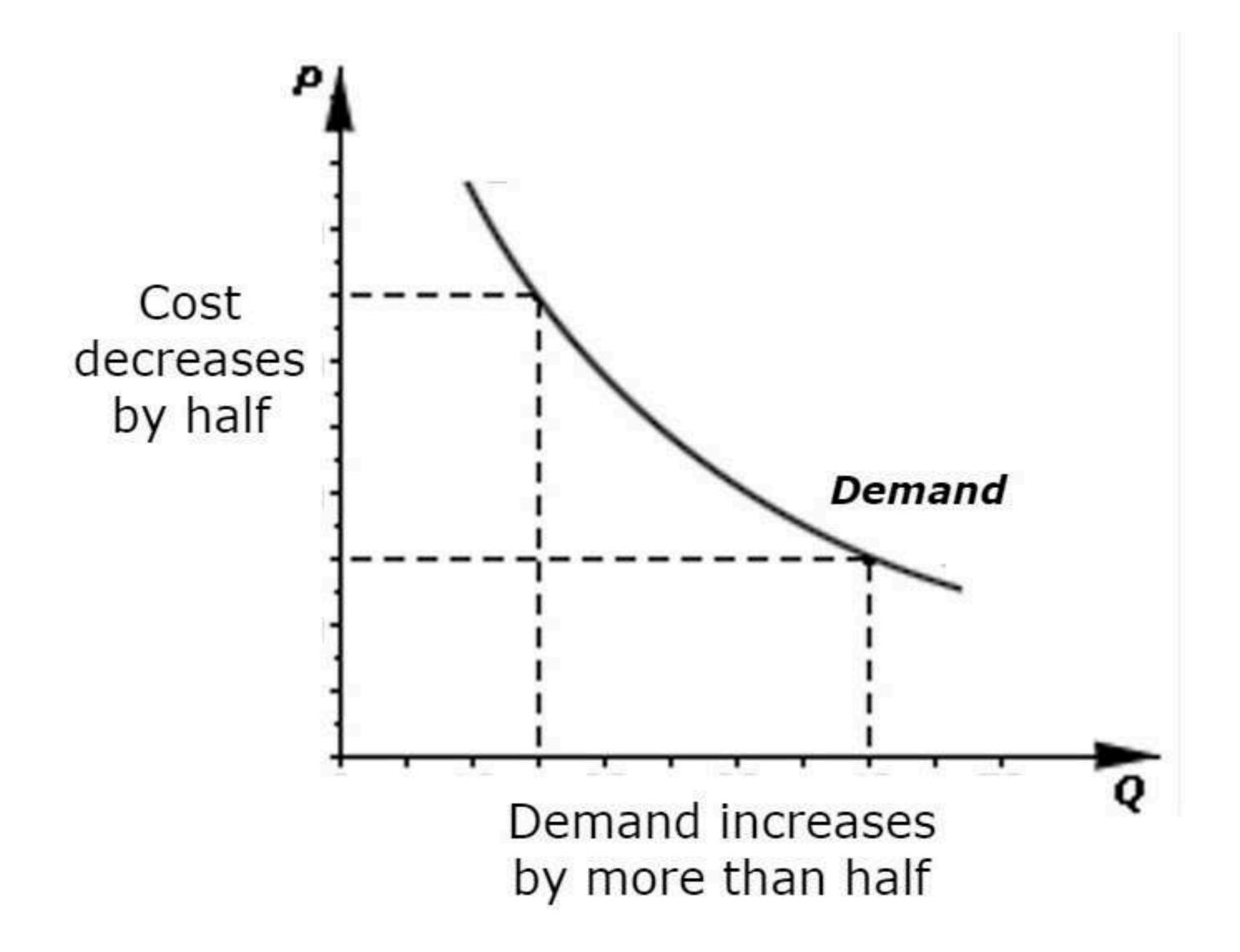
Sources: ARK Investment Management LLC, 2024, based on data from Metaculus, including benchmark details, as of January 3, 2024. Benchmark broadly requires the successful passage of an adversarial two-hour Tuning test, broad success on a Q&A knowledge and logic benchmark, and the successful interpretation of and execution complex model car assembly instruction, all within a single system. Green lines are derived estimates for time to general purpose AI (strongly formulated) based upon forecasts for a weaker benchmark. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.

## Physical Scaling



## Algorithmic Progress + Unhobbling



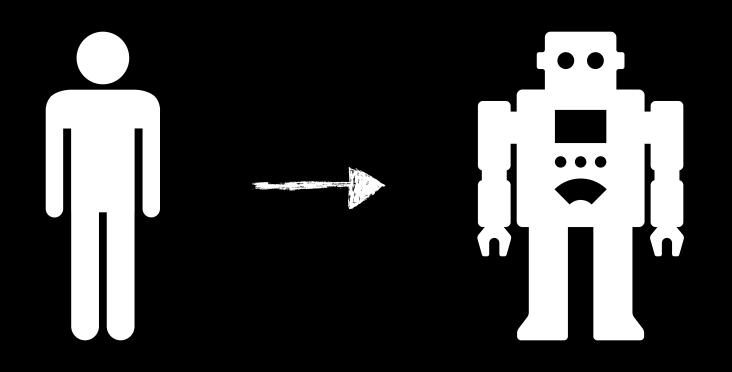


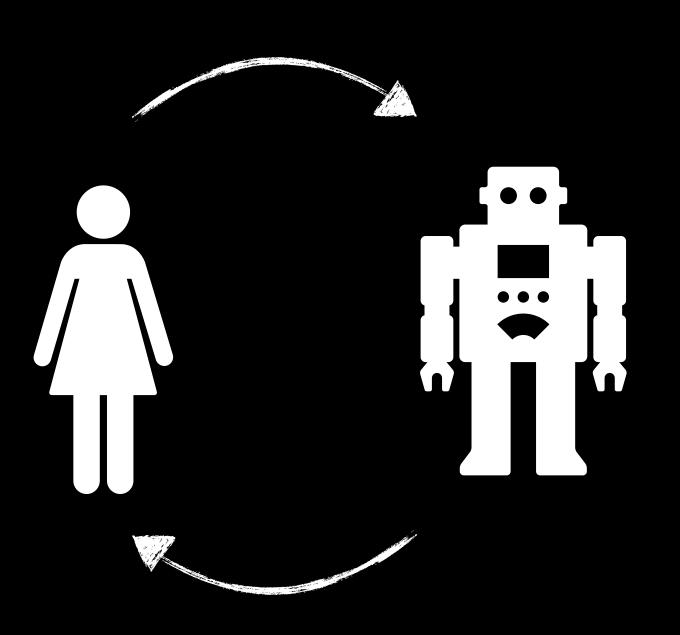
#### GPQA Diamond (Scientific Reasoning) vs. Price

GPQA Diamond score; Price: USD per 1M Tokens (blended pricing, weighted 3 input tokens to 1 output token) Most attractive quadrant ■ o1 ■ o3-mini ■ GPT-4o (Nov '24) ■ GPT-4o mini ■ o3-mini (high) ■ GPT-4.5 (Preview, score based on lab claimed numbers) Llama 3.3 70B Claude 3.7 Sonnet Thinking Claude 3.7 Sonnet Mistral Large 2 (Nov '24) DeepSeek R1 DeepSeek V3 Artificial Analysis ,o3-mini (high) 0.8 -\_\_01 0.75 -DeepSeek R1 0.7 -GPT-4.5 (Preview) Claude 3.7 Sonnet Thinking GPQA Diamond 0.65 Claude 3.7 Sonnet 0.6 -DeepSeek V3 GPT-40 (Nov '24) 0.55 Mistral Large 2 (Nov '24) Jama 3.3 70B 0.45 -GPT-40 mini 0.35 -\$70.00 \$10.00 \$20.00 \$30.00 \$50.00 \$60.00 \$80.00 \$100.00 \$0.00 \$40.00 \$90.00 Price (USD per M Tokens)

## Automation vs Augmentation

How value is distributed

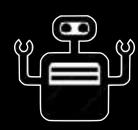






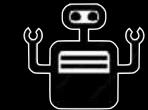
Al company?

traditional economy



autonomous company

automation



## Case from history: Electric Dynamo

#### The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox

By PAUL A. DAVID\*

Many observers of recent trends in the industrialized economies of the West have been perplexed by the conjecture of rapid technological innovation with disappointingly slow gains in measured productivity. A generation of economists who were brought up to identify increases in total factor productivity indexes with "technical progress" has found it quite paradoxical for the growth accountants' residual measure of "the advance of knowledge" to have vanished at the very same time that a wave of major innovations was appearing—in microelectronics, in communications technologies based on lasers

If, however, we are prepared to approach the matter from the perspective afforded by the economic history of the large technical systems characteristic of network industries, and to keep in mind a time-scale appropriate for thinking about transitions from established technological regimes to their respective successor regimes, many features of the so-called productivity paradox will be found to be neither so unprecedented nor so puzzling as they might otherwise appear.

## Fastest growing and declining jobs by 2030



1	Top fastest growing jobs		Top fastest declining jobs
1	Big data specialists	1	Postal service clerks
2	FinTech engineers	2	Bank tellers and related clerks
3	Al and machine learning specialists	3	Data entry clerks
4	Software and applications developers	4	Cashiers and ticket clerks
5	Security management specialists	5	Administrative assistants and executive secretaries
6	Data warehousing specialists	6	Printing and related trades workers
7	Autonomous and electric vehicle specialists	7	Accounting, bookkeeping and payroll clerks
8	UI and UX designers	8	Material-recording and stock-keeping clerks
9	Light truck or delivery services drivers	9	Transportation attendants and conductors
10	Internet of things specialists	10	Door-to-door sales workers, news and street vendors, and related workers
11	Data analysts and scientists	11	Graphic designers
12	Environmental engineers	12	Claims adjusters, examiners and investigators
13	Information security analysts	13	Legal officials
14	DevOps engineers	14	Legal secretaries
15	Renewable energy engineers	15	Telemarketers

#### **OpenAl Imagines Our Al Future**

#### Stages of Artificial Intelligence

Level 1	Chatbots, AI with conversational language

Reasoners, human-level problem solving Level 2

Level 3 Agents, systems that can take actions

Innovators, AI that can aid in invention

Organizations, AI that can do the work of an organization

Source: Bloomberg reporting

Level 4

Level 5

we are here

	1 - Not very valuable	2	3 - Moderately valuable	3	5 - Very valuable	Unsure
integrations: Connect ChatGPT with even more of your favorite apps and tools (e.g., email, calendar, Slack), making it seamless to access your files, manage your schedule, and stay organized—all in one place.		0		0		
Agentic actions: ChatGPT can take actions on your behalf —like booking a trip, making a restaurant reservation, scheduling meetings, and drafting email responses automatically.		0		0		
Meeting bot: A smart assistant that joins your meetings to take notes, summarize key points, and highlight action items, ensuring you never miss important details.		0		0	0	



#### OpenAl reportedly plans to charge up to \$20,000 a month for specialized Al 'agents'

OpenAI may be planning to charge up to \$20,000 per month for specialized AI "agents," according to The Information.

The publication reports that OpenAl intends to launch several "agent" products tailored for different applications, including sorting and ranking sales leads and software engineering. One, a "high-income knowledge worker" agent, will reportedly be priced at \$2,000 a month. Another, a software developer agent, is said to cost \$10,000 a month.

OpenAl's most expensive rumored agent, priced at the aforementioned \$20,000-per-month tier, will be aimed at supporting "PhD-level research," according to The Information.

It's unclear when these agentic tools might launch or which customers will be eligible to purchase them. But The Information notes that SoftBank, an OpenAl investor, has committed to spending \$3 billion on OpenAl's agent products this year alone.

## Where does value ultimately accrue?

#### 2000's "Search Wars"















#### 2020's "AI Wars"



















## Enterprise software?



## Klarna CEO explains

# Fost Sebastian Siemiatkowski Kale Relation Siemiatkowski Maklarnaseb Yes, we did shut down Salesforce a year ago, as we have many SaaS providers—an internal estimate is about 1,200 SaaS shut down. No, I don't think it is the end of Salesforce; might be the opposite.

Here is what actually happened and how/why we originally intended to NOT share it publicly:

At Klarna, we decided early to explore the potential of AI and LLMs—mostly ChatGPT—while being open to testing all things that seemed to be trending.

We encouraged all employees to do so and allowed them to pursue ideas organically rather than following "management direction" on exactly what they should be building.

In the early days of ChatGPT, we heard a lot: "this tool allows you to feed all your PDFs, all your data sources to a LLM!"

However, the old universal truth of data scientists still holds true, even in Al: "shit in, shit out."

## My thoughts about enterprise software

- Companies need
  - Unification
  - Adaptation
  - Control

## Conclusion

#### GROWTH MINDSET

**MISTAKES** IIMPROVE FEEDBACK **HELP ME LEARN** WITH PRACTICE **IS VALUABLE** IS THIS MY BEST **WORK?** I WON'T **GIVE UP** 

# FIXED MINDSET

I KNOW BEST I'LL NEVER BE THAT SMART I WANT TO
AVOID MAKING
MISTAKES

THIS IS GOOD ENOUGH

I GIVE UP





# Agency

Q&A