

INF367 25H: Selected Topics in Artificial Intelligence

Diamonds and Rust in the AI Treasure Chest

Dario Garigliotti - UiB - Lectures 1, 2

Welcome to INF367 25H / Selected Topics in Artificial Intelligence

- a.k.a. *Diamonds and Rust in the AI Treasure Chest*



Information about the course

INF367 25H / Selected Topics in Artificial Intelligence

Main links

- MittUiB page: <https://mitt.uib.no/courses/55031>
- Course description: <https://www4.uib.no/emner/INF367>

INF367 25H / Selected Topics in Artificial Intelligence

Course instructor, Contacts

- Dario Garigliotti, postdoc at the Department of Informatics, UiB.
 - How to contact: dario.garigliotti@uib.no .
- For **study administrative questions**:
 - Students can contact study administration by email here: studieveileder@ii.uib.no .
 - Study administrative questions sent via MittUiB message systems may not be seen/ answered in time, unfortunately.

INF367 25H / Selected Topics in Artificial Intelligence

When and where

- When?
 - Lectures: early on Mondays (8:15 - 10) and late on Fridays (14:15 - 16)
 - Høstferie: 06.10. - 10.10
- Where?
 - HiB Aktiv Rom 2 (at least for the first three weeks)

INF367 25H / Selected Topics in Artificial Intelligence

Materials, Topics

- Book: *Why machines learn: The elegant math behind modern AI*, by Anil Ananthaswamy (2024)
- Slides to be released after lecture
- The major parts of the course will cover these topics:
 - Milestones in the history of AI techniques towards deep learning paradigm, and
 - Aspects of modern natural language processing, with few other very recent topics like AI explainability and safety.

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Also

- Oral exam
- Assignment
- Group sessions
- Course plan / Syllabus

Lecture 1

Outline

- Intro's intro
- Intro to AI



Intro's intro

AI breakthrough and through

- A notable progress
 - in multiple areas of application
 - Image processing, language processing, robotics, integrations of these
 - in many domains of information
 - Specialized sensitive domains like financial, medical, legal information
 - involving many aspects of interest
 - such as intelligence, cognition, embodiment, safety, explainability

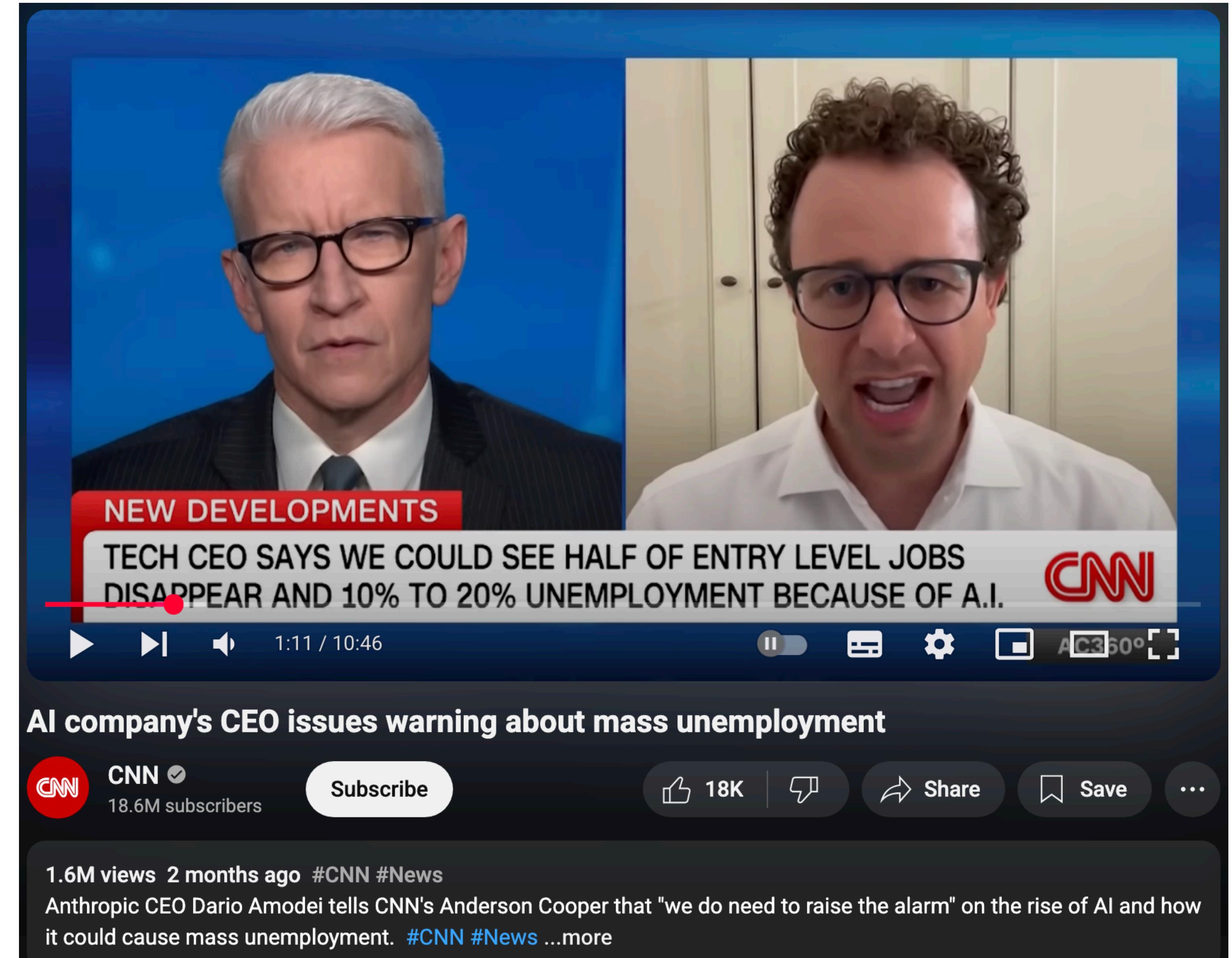
Diamonds and Rust in the AI Treasure Chest

- Plenty of precious stones in the treasure
- But also rust from fake precious metals



AI hype status

E.g. Anthropic (1)

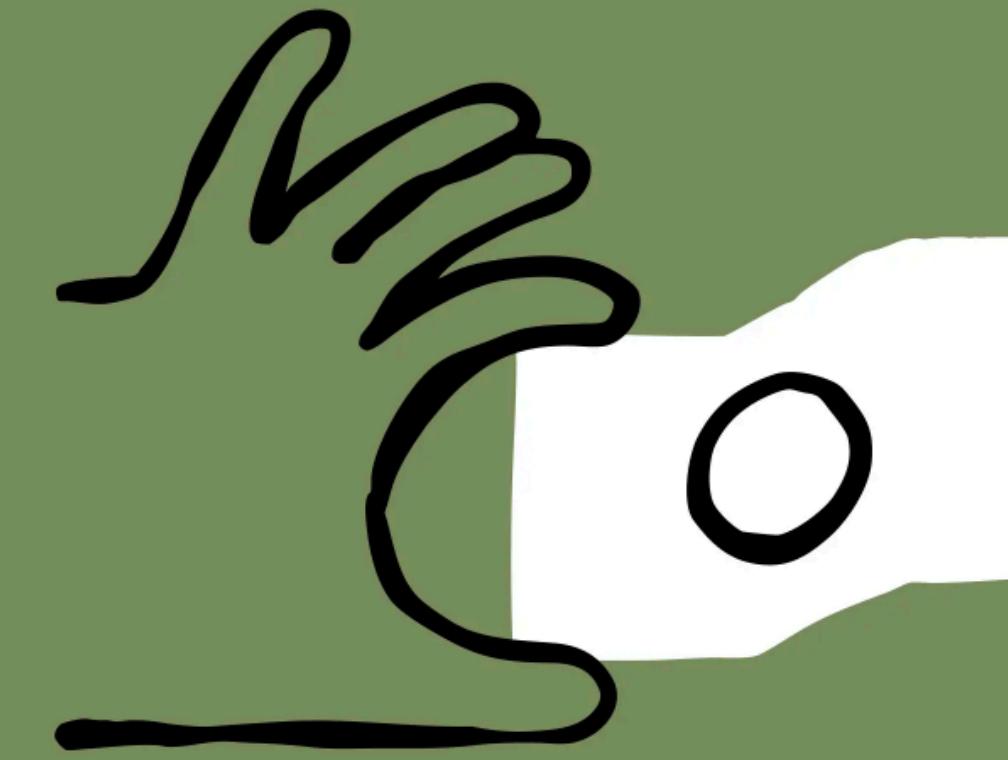


AI hype status

E.g. Anthropic (2)

Project Vend: Can Claude run a small shop? (And why does that matter?)

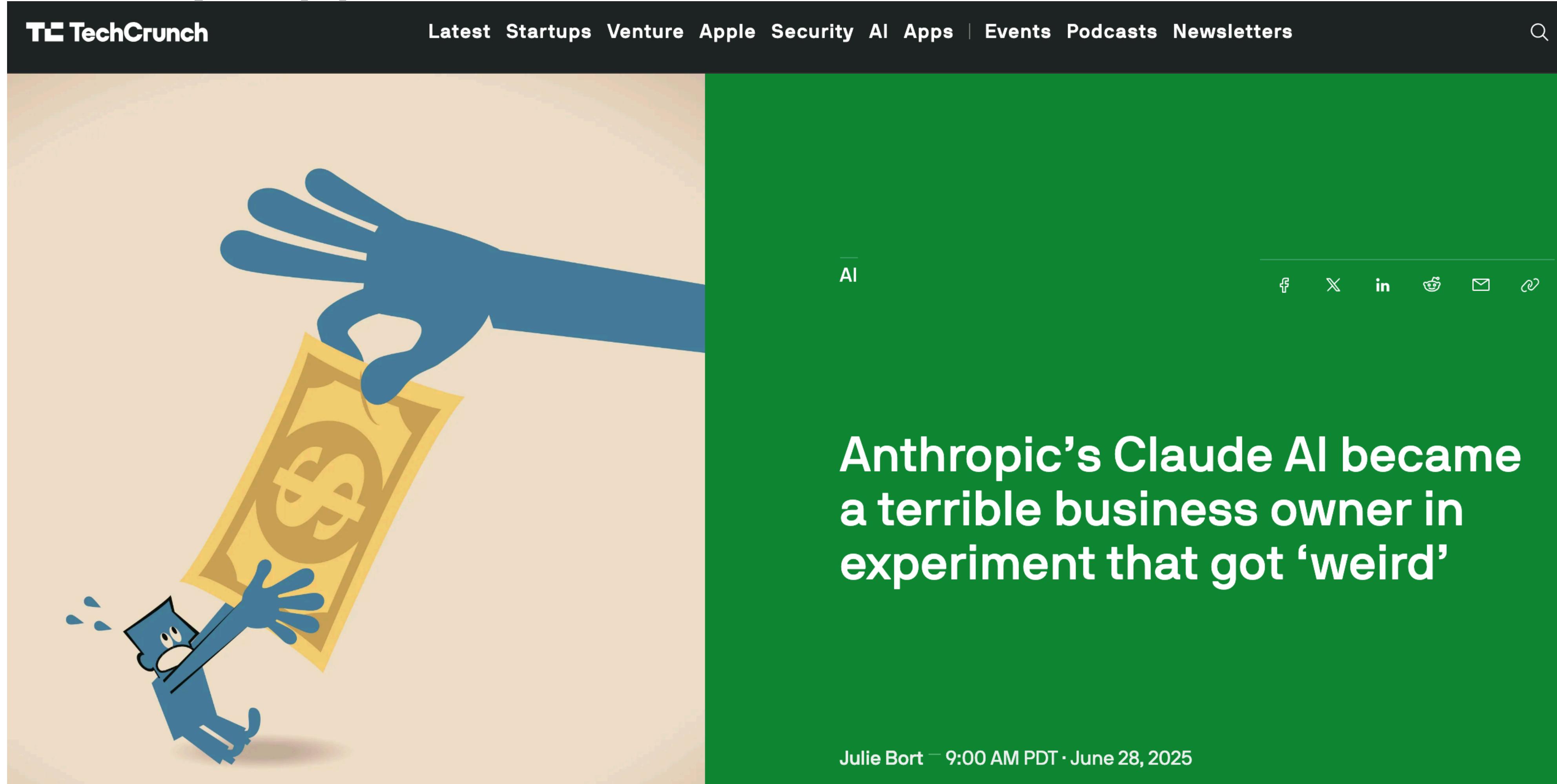
27 Jun 2025



We let Claude manage an automated store in our office as a small business for about a month. We learned a lot from how close it was to success—and the curious ways that it failed—about the plausible, strange, not-too-distant future in which AI models are autonomously running things in the real economy.

AI hype status

E.g. Anthropic (2)



The image shows a TechCrunch article thumbnail. The top navigation bar includes the TechCrunch logo, a search icon, and categories like Latest, Startups, Venture, Apple, Security, AI, Apps, Events, Podcasts, and Newsletters. The main visual is a cartoon illustration of a blue hand reaching down from above to grab a large gold dollar bill from a smaller blue character who is falling or reaching up. The text on the right side reads "Anthropic's Claude AI became a terrible business owner in experiment that got 'weird'" by Julie Bort on June 28, 2025.

TechCrunch

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AI

f X in 📺 📧 🌐

Anthropic's Claude AI became a terrible business owner in experiment that got 'weird'

Julie Bort — 9:00 AM PDT · June 28, 2025

AI hype status

E.g. Apple

The reviews are in for Apple's (AAPL) WWDC 2025 keynote presentation and **they aren't good**. Analysts called it "a dud," "a yawner," "disappointing" and more. And the news didn't help Apple stock.

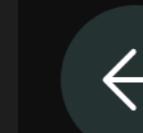
10 Jun 2025



Investor's Business Daily

<https://www.investors.com> › news › technology › apple... :

Apple Offers Little To Get Excited About At WWDC



r/LocalLLaMA • 2 mo. ago
ExplanationEqual2539

...

Feels like, Apple's busted, with the ai race... WWDC 2025 conclusion: No update, all minor updates... Does anyone else feeling the same-way?

Discussion

They could have better skipped the WWDC

↑ 41 ↓

0 89



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AI hype status E.g. OpenAI

OpenAI to Hit \$12.7 Billion in Revenue This Year. But Won't Be Profitable Until \$125 Billion in Revenue, Per Bloomberg

by Jason Lemkin | Artificial Intelligence (AI), Blog Posts

Bloomberg

Live TV Markets ▾ Economics Industries Tech Politics Businessweek Opinion More

OpenAI: Revenue Forecast | Musk Bid Rejected | o3-Mini Model | AI Agent | SoftBank Talks | S

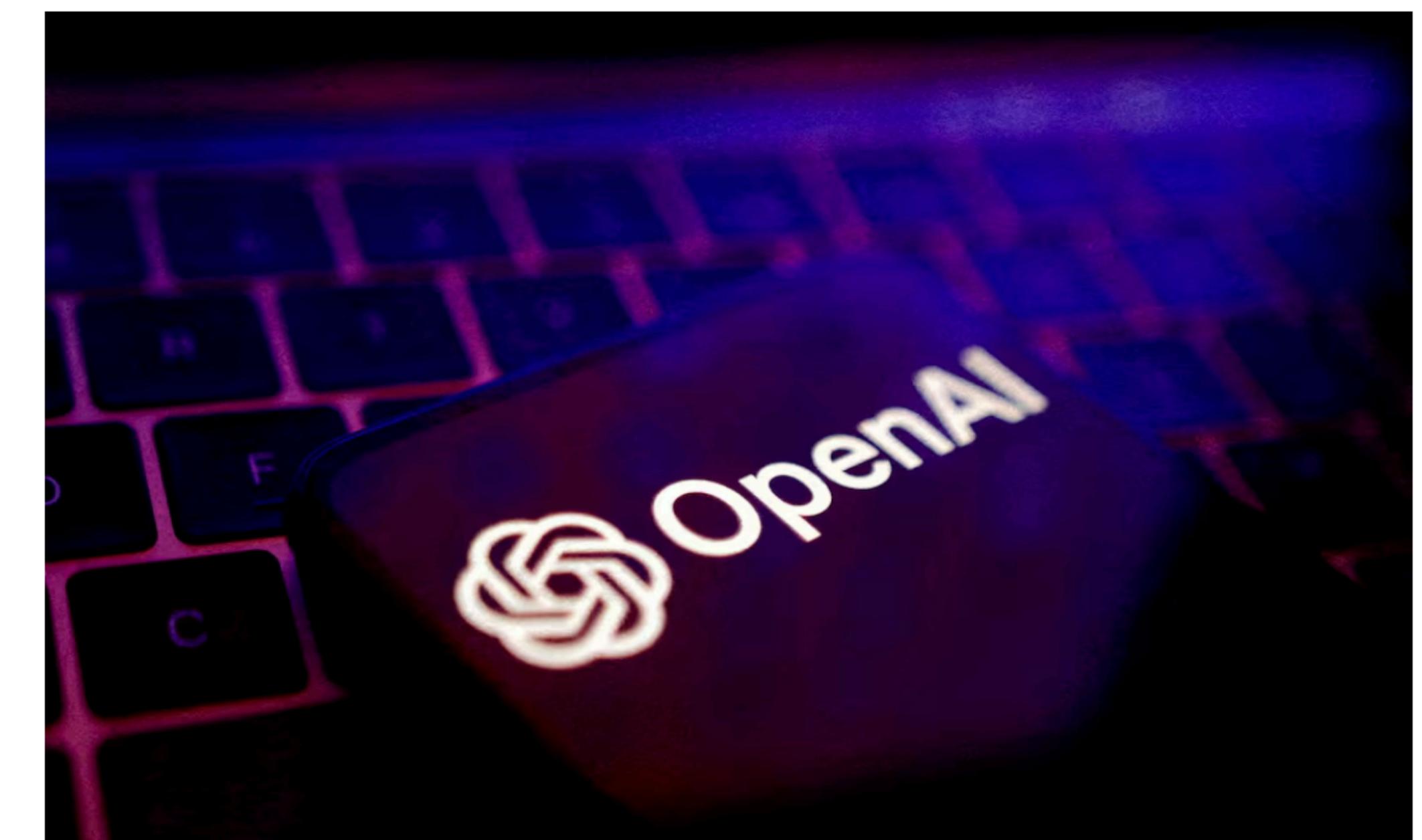
Technology | AI

OpenAI Expects Revenue Will Triple to \$12.7 Billion This Year

OpenAI does not expect to be cash-flow positive until 2029, Bloomberg News reports

By Reuters

March 26, 2025 8:15 PM GMT+1 · Updated March 26, 2025



OpenAI logo is seen in this illustration taken May 20, 2024. REUTERS/Dado Ruvic/Illustration/File Photo [Purchase Licensing Rights](#)

March 26 (Reuters) - OpenAI is not expecting its cash flow to turn positive until 2029, Bloomberg News reported on Wednesday, citing a person familiar with the matter.

The San Francisco-based artificial intelligence bellwether is grappling with significant costs from chips, data centers and talent needed to develop cutting-edge AI systems, according to the report.

AI hype status

E.g. Meta

[r/GenAI4all](#) • 3 mo. ago
Critical-List-4899

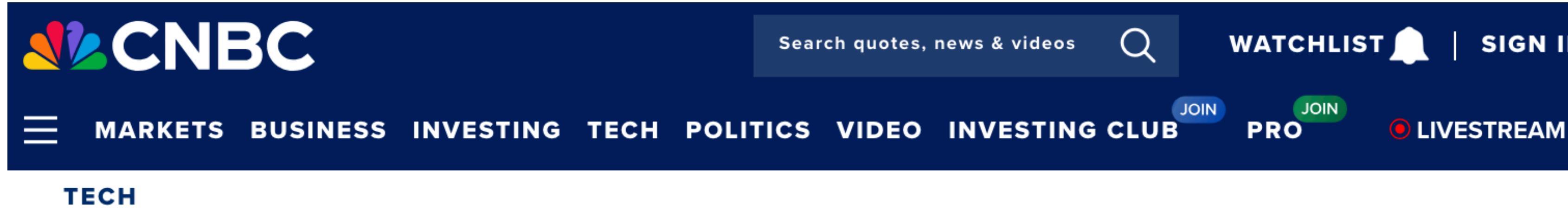
Meta CEO Mark Zuckerberg said, 'Within 12 to 18 months, most of the code will be written by AI.' It's crazy to think that a skill engineers were told to spend four years learning could be largely automated within five. What's next, designers, marketers, even managers?

Discussion



AI hype status

E.g. Microsoft



The image shows the top navigation bar of the CNBC website. It features the NBC peacock logo and the word "CNBC" in white on a dark blue background. To the right is a search bar with the placeholder "Search quotes, news & videos" and a magnifying glass icon. Further right are "WATCHLIST" with a bell icon and "SIGN IN". Below the main menu, there's a secondary navigation bar with categories: MARKETS, BUSINESS, INVESTING, TECH, POLITICS, VIDEO, INVESTING CLUB, PRO, and LIVESTREAM. The "TECH" category is highlighted in blue. On the far left of the secondary bar is a three-line menu icon.

Satya Nadella says as much as 30% of Microsoft code is written by AI

PUBLISHED TUE, APR 29 2025 9:33 PM EDT | UPDATED TUE, APR 29 2025 9:58 PM EDT



Jordan Novet
@JORDANNOVET

Jonathan Vanian
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KEY POINTS

- Microsoft CEO Satya Nadella on Tuesday said that as much as 30% of the company's code is now written by artificial intelligence.

AI hype status

THE WALL STREET JOURNAL.

World Business U.S. Politics Economy Tech Markets & Finance Opinion Arts Lifestyle

Software's Death by AI Has Been Greatly Exaggerated

Providers like Salesforce and Workday won't be easy to replace

By [Dan Gallagher](#) [Follow](#)

Aug. 27, 2025 5:30 am ET

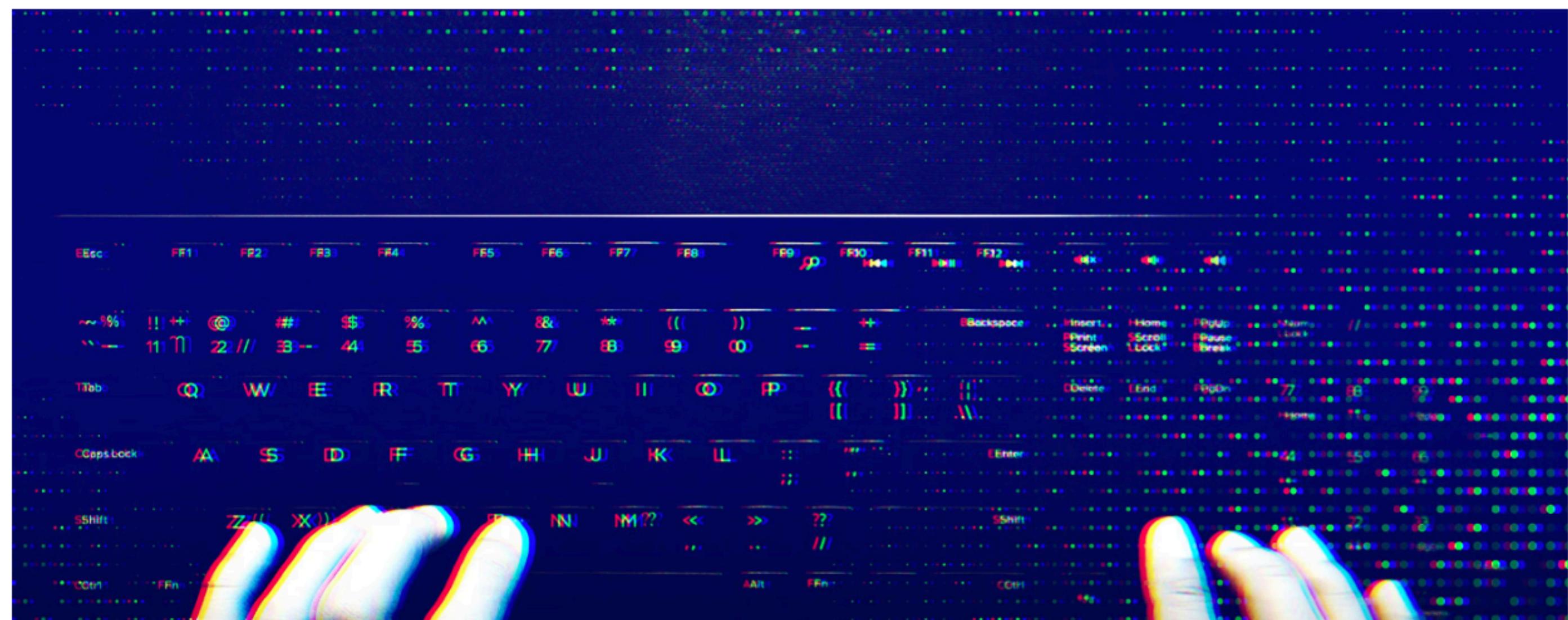
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AI hype status

E.g. Meta

BUSINESS INSIDER

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Meta just hired the co-creator of ChatGPT in an escalating AI talent war with OpenAI

By [Katherine Li](#)



Manuel Orbegozo/REUTERS

Jul 26, 2025, 3:16 AM CEST

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- Meta hires Shengjia Zhao, ChatGPT co-creator, as chief scientist of its Superintelligence Labs.

AI hype status

E.g. Meta

Entrepreneur

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Mark Zuckerberg Reportedly Made One Person a \$1.5 Billion Job Offer — and Was Rejected. Here's How Google, Microsoft, and OpenAI Are Competing with Meta in the AI Talent Wars.

New Meta hires have accepted compensation packages worth hundreds of millions of dollars.

BY [SHERIN SHIBU](#) EDITED BY [MELISSA MALAMUT](#) AUG 8, 2025

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Key Takeaways

- ▶ Meta reportedly offered one AI researcher over a billion dollars to join its superintelligence team, highlighting the considerable price tag of finding top AI talent.
- ▶ In addition to high compensation, other recruiting tactics in the AI talent wars include CEOs personally reaching out to potential hires.

AI hype status

E.g. Meta

THE WALL STREET JOURNAL.

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ARTIFICIAL INTELLIGENCE

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Meta Freezes AI Hiring After Blockbuster Spending Spree

Company reorganizes its sprawling artificial-intelligence operation, whose spiraling cost has drawn investor scrutiny

By Meghan Bobrowsky [Follow](#)

Aug. 20, 2025 9:00 pm ET

AI hype status

E.g. OpenAI

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OpenAI CEO Sam Altman Concedes GPT-5 Was a Misfire, Bets on GPT-6



Jason Nelson
Wed, August 20, 2025 at 7:18 PM GMT+2 • 3 min read

decrypt

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E.g. OpenAI

≡ SEARCH

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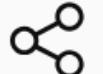
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AI · OPENAI

Sam Altman admits OpenAI ‘totally screwed up’ its GPT-5 launch and says the company will spend trillions of dollars on data centers

BY EVA ROYTBURG
FELLOW, NEWS

August 18, 2025 at 1:23 PM EDT

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Altman forecasts that his broad OpenAI visions require trillions of dollars in infrastructure development.

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AI hype status

E.g. OpenAI

The Telegraph



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The warning signs the AI bubble is about to burst

Shock sell-off after study warns most investments in artificial intelligence get zero returns



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AI hype status

Forbes

INNOVATION > AI

AI's \$1 Trillion Shakeout: Bubble, Correction, Or Market Reset

By [Mark Minevich](#), Contributor. ⓘ Mark Minevich is a NY-based strategist focused on human centric AI.



Follow Author

Published Aug 26, 2025, 08:32pm EDT, Updated Aug 26, 2025, 08:56pm EDT

In recent weeks, AI investors and enterprise leaders have felt the yo-yo effect of the AI market. Starting August 18, a four-day slide erased almost \$1 trillion from the market caps of tech's megacap companies. Nvidia, Palantir, and other so-called AI companies shed billions in value in a matter of days. Meta has announced a hiring freeze in its AI division. Even the CEO of OpenAI, Sam Altman, casually remarked that “AI is a bubble.”

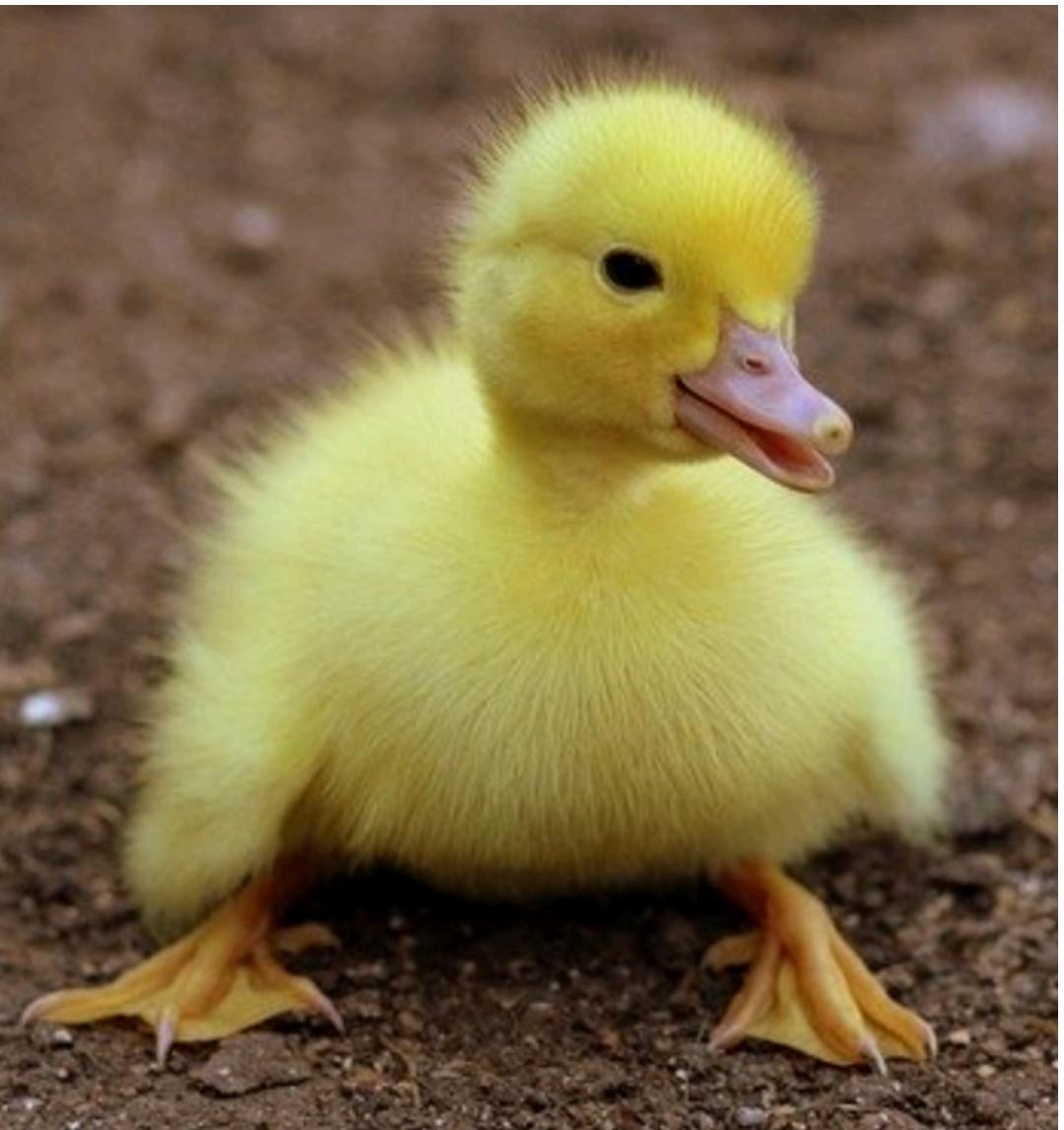
Intro

An introduction to AI

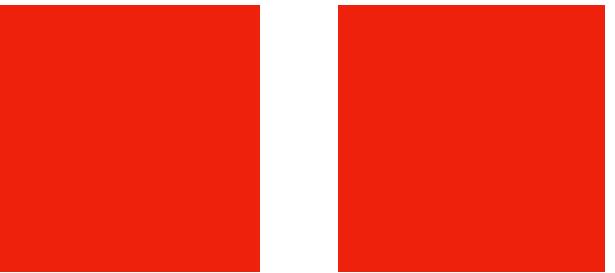
- The current AI hype
- History repeats a similar hype

Patterns, Learning

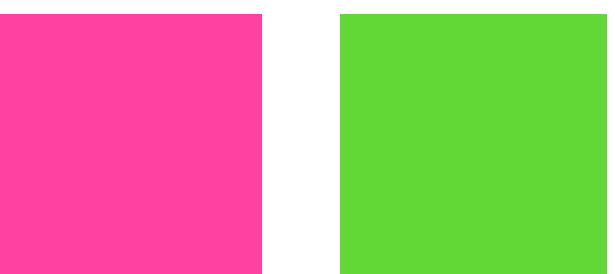
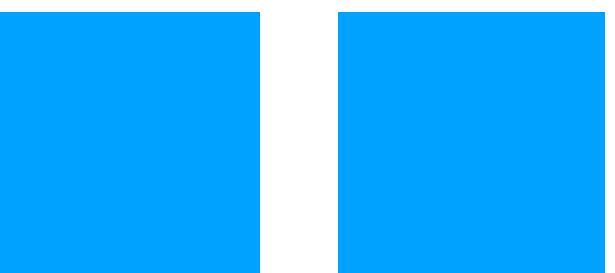
The case of some ducklings



1. Imprinting



2. Behaviour

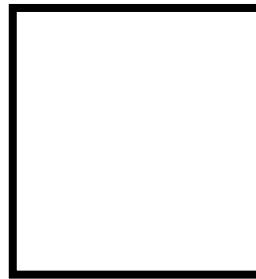


Patterns, Learning

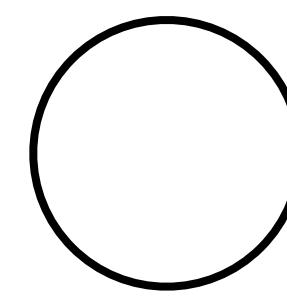
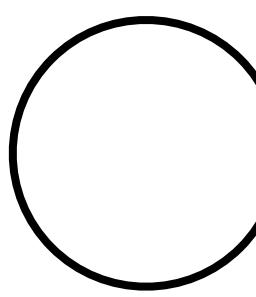
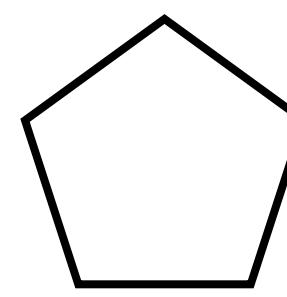
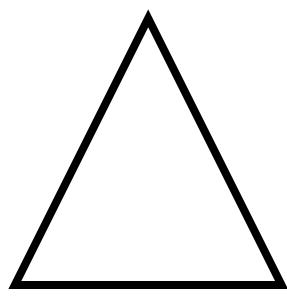
The case of some ducklings



1. Imprinting

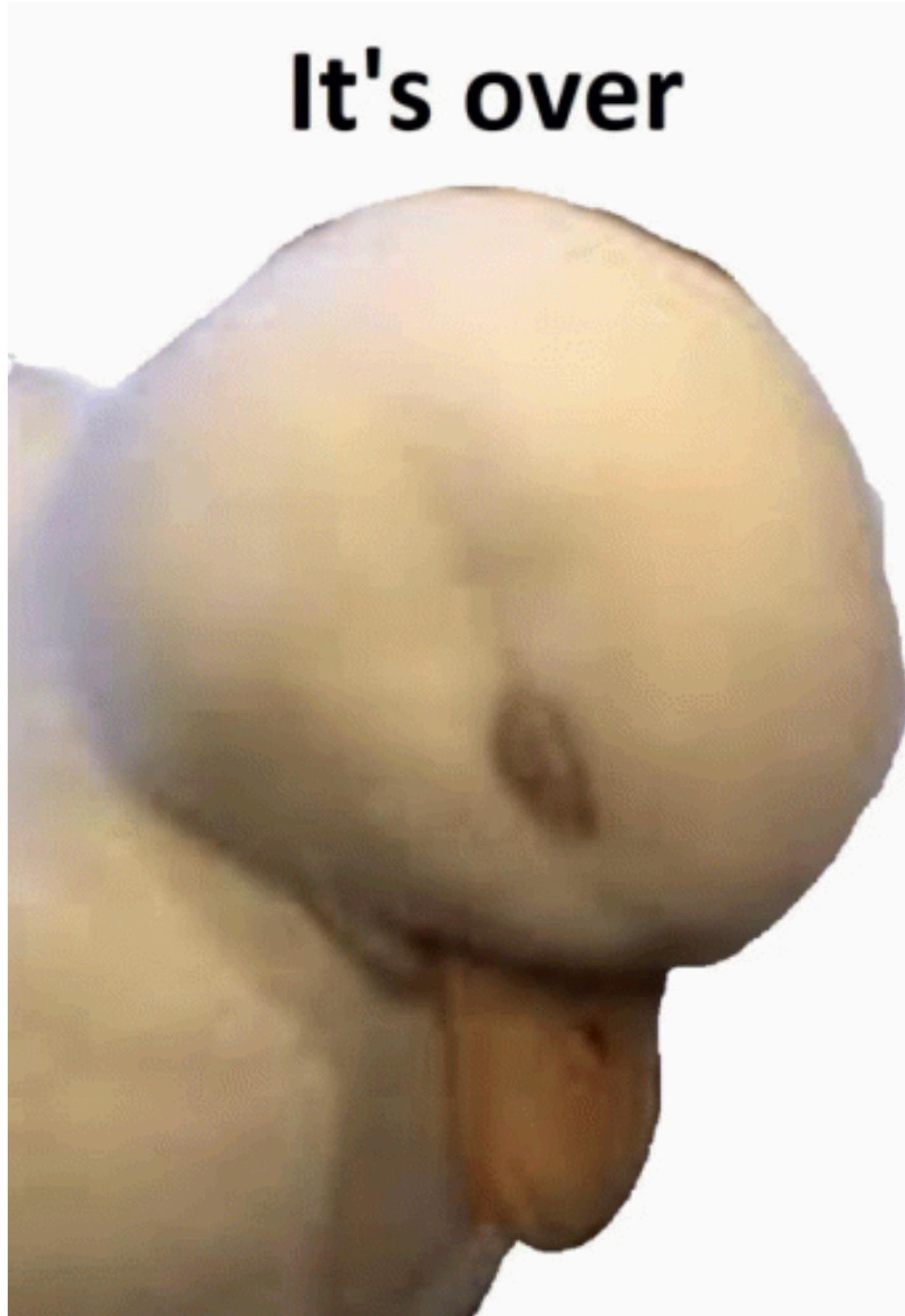


2. Behaviour



Anyways

- AI is evil



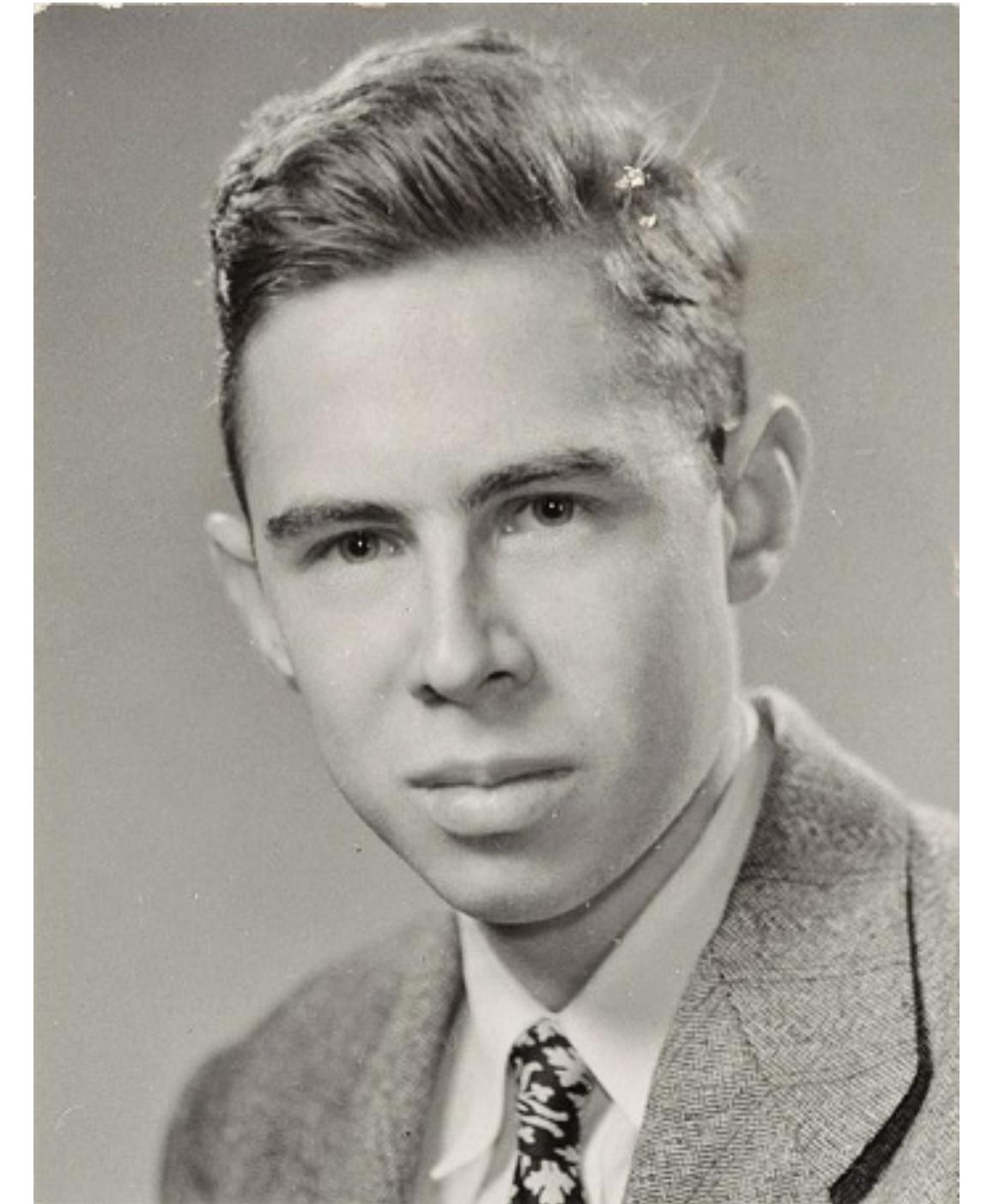
It's over

Patterns, Learning

- Main modalities in modern AI: image, language
 - Humans are (heavily) visual
 - Several applications in progress like car driving, and many image tasks
 - Text now becoming very relevant because of LLMs for QA, summarization
- Inf367 2025h: general ml, then a bit more into nlp, and other aspects of AI

Perceptron

- Introduced by Rosenblatt in 1958
- (Associated hype in press and in academia)
- Why was so groundbreaking?
 - Learns from data
 - Is brain-inspired (combining MCP, Hebbian)
 - Guarantees of existence of solution under conditions
 - Expectations/hype to learn to do every task



Example of pattern finding (learning?)

x1	x2	y
4	2	8
1	2	5
0	5	10
2	1	4

- $y = x1 + 2 * x2 = h1(x)$
- Other candidates, e.g.
 - $h2(x) = x1 * x2$
 - $h3(x) = x1 + x2 + 2$

Learning from data

- In the example:
 - $y = x_1 + 2 * x_2 = h_1(x)$
 - I.e. $y = w_1 * x_1 + w_2 * x_2, \quad w_1 = 1, w_2 = 2$
- Two key steps:
 - Assuming of model family (e.g. linear separation)
 - Determining the weights of the relationship (e.g. of the linear model)

Learning from data

Some typical aspects

- Paradigms of learning: supervised, unsupervised, reinforcement
- Dataset with labeled data points, instances or examples
- Training (, validation,) and testing subsets
- Importance of the quality of data (volume, representativeness)

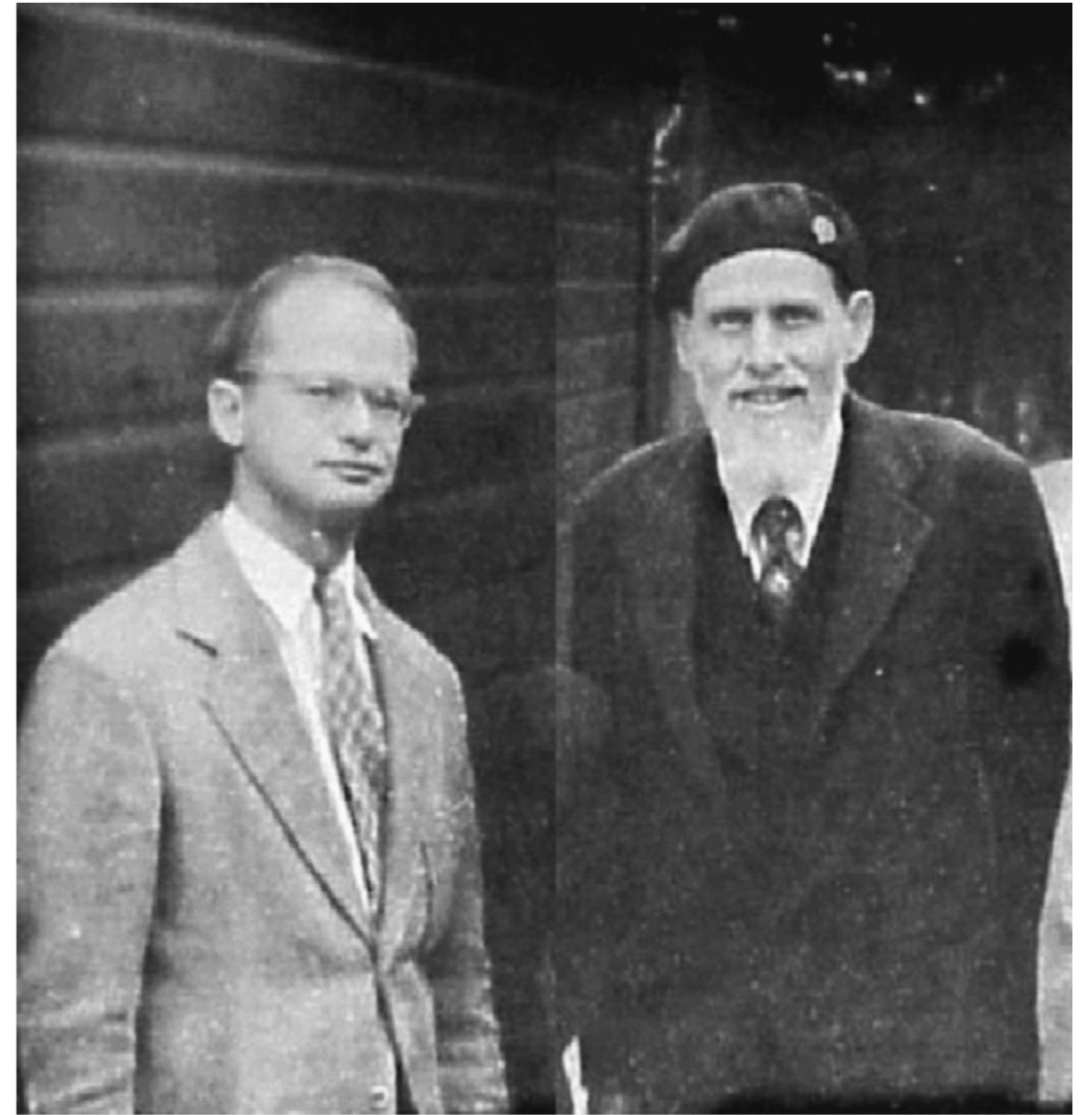
Learning from data

Temperature today	Cloudy today?	Rainy tomorrow?
25	y	y
19	n	y

House size (sq. m.)	# Bedrooms	Price (nok)
85	2	3,000,000
120	4	6,123,000
77	2	2,500,000

First artificial neuron

- MCP neuron, introduced by McCulloch and Pitts in 1943
- Context: “all computation reduced to logic”
 - *If brain is a computational device, how does it implement this logic?*
- Perform any computation by mixing basic units
- Unit of computation, without learning



Perceptron

- Combines
 - MCP: biologically-inspired unit of computation, extended by networks
 - Hebbian learning: learning due to strengthening neural connections as output of one neuron consistently fires into input of another one
- I.e. basic neuron model with learning algorithm
 - Learned weights “encode”/represent knowledge that is “remembered”