

<https://mco.dev/IntroAI.pdf>

Intro to Artificial Intelligence

What a well informed person should know

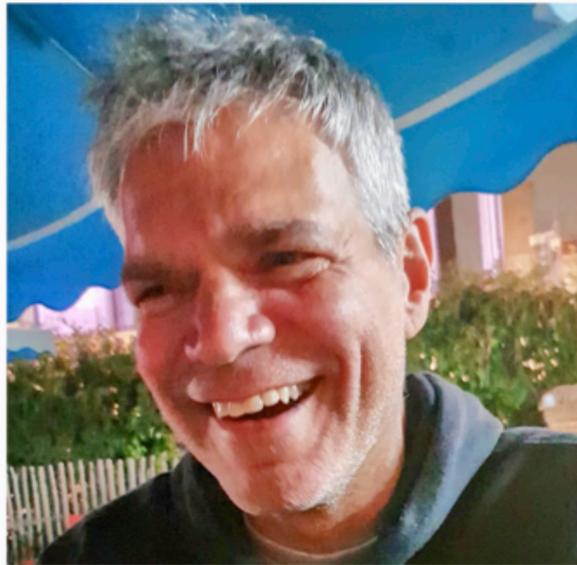
Marc Cohen

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Logistics

- 1 sessions x 6 hours (21 Feb 2026)
- Format: lectures, demos, and discussions
- Seven minute break every hour
- Toilets
 - M: Ground, 1st, 2, 5
 - F: Ground, 1st, 3rd, 4th, 6th
- Videos: [Welcome to City Lit](#), [Safety at City Lit](#)
- My email: Marc.Cohen@citylit.ac.uk (reach out any time)
- IT Support: ItHelpDesk@citylit.ac.uk

About Marc



I'm an American software engineer based in London. My mission is building tools, tutorials, and online courses to help make computing, mathematics, and data science more accessible and more inclusive.

I have an MEng degree in Computer Science from Cornell, a BA in Mathematics from Rutgers, and over 40 years of experience as a software developer and engineering manager at Bell Labs, Lucent Technologies, and Google.

Prerequisites

- **You are human (bots not allowed)**
- **You are curious about AI and want to learn more**
- **No technical knowledge, programming, or maths required**

Goals

- **Learn a little about the history of AI**
- **Gain a sense of what AI can do for you (and try it yourself)**
- **Understand how it works**
- **Appreciate some of the risks and pitfalls**
- **In general, be able to have an intelligent conversation about AI**

Non-Goals

- **Deep dive**
- **Definitively answer ethical, policy or societal questions**
- **Predict the future**

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- [Definitions](#)
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- [Demos & Exercises](#)
- [Mechanics](#)
- [Ethics](#)
- [The Future](#)



A Personal Story

Part 1 - an idea

August 2016

Option 1 - Interactive Trivia Quiz Challenge Game

Inspired by [quizup](#) but a PWA rather than a native app and used as a way to illustrate backend design principles. We'll build this app in steps and highlight important lessons as they arise in the design process.

Requirements

- Usage flow
 - Visit site (quizr.io)
 - Anonymous mode works out of the box
 - Ability to do quiz challenges with random other users but no user profile, no persistence of results, no leaderboard, no history
 - Establish a user profile
 - Challenge random or selected opponent to real time trivia challenge
 - Challenger selects subject, responder accepts or rejects (repeat until agreement)
 - Quiz conducted in real time using webRTC data (with optional video)
 - Results are persistent
 - Leaderboards maintained
 - Questions are accessed dynamically via network (caching is not particularly helpful because real time contents won't work while offline)
- Utilize an [open trivia question database](#)
- Implemented as a PWA
- Both a hosted service and an open source code example
- FE uses either react or Angular 2 (TBD)
- Use to illustrate state of the art back end capabilities

App Stages

1. FE - UI starts with anonymous mode only.
2. Add successive features by implementing an API (REST or gRPC). With each step, highlight options and considerations in choosing backend technology
 - a. sign in and user profile management

March 2023

**Wouldn't it be
cool to have a
free quiz game
for everyone
powered by AI?**

A Personal Story

Part 2 - AI as support service



quizaic



quizgen.py 2 x



api > pyquizaic > generators > quiz > gemini-pro > quizgen.py > ...



```
38 class Quizgen(BaseQuizgen):
53     return ["free-form", "multiple-choice"]
54
55     @staticmethod
56     def predict_llm(
57         model_name, prompt, temperature, max_output_tokens, top_p, top_k, tuned_model=""
58     ):
59         model = GenerativeModel(model_name)
60         responses = model.generate_content(
61             prompt, stream=True, generation_config = {
62                 "temperature": temperature,
63                 "top_k": top_k,
64                 "top_p": top_p,
65             }
66         )
67         result = ""
68         for response in responses:
69             #print(f"{response=}")
70             result += response.text
71         return result
72
73     # Load quiz from a quiz_<topic>.json file, mainly for testing
```



main*



0 2



Ln 1, Col 1

Spaces: 4

UTF-8

LF

{ } Python



Select Interpreter



sentiment.ts

write_sql.go

parse_expenses.py

addresses.rb

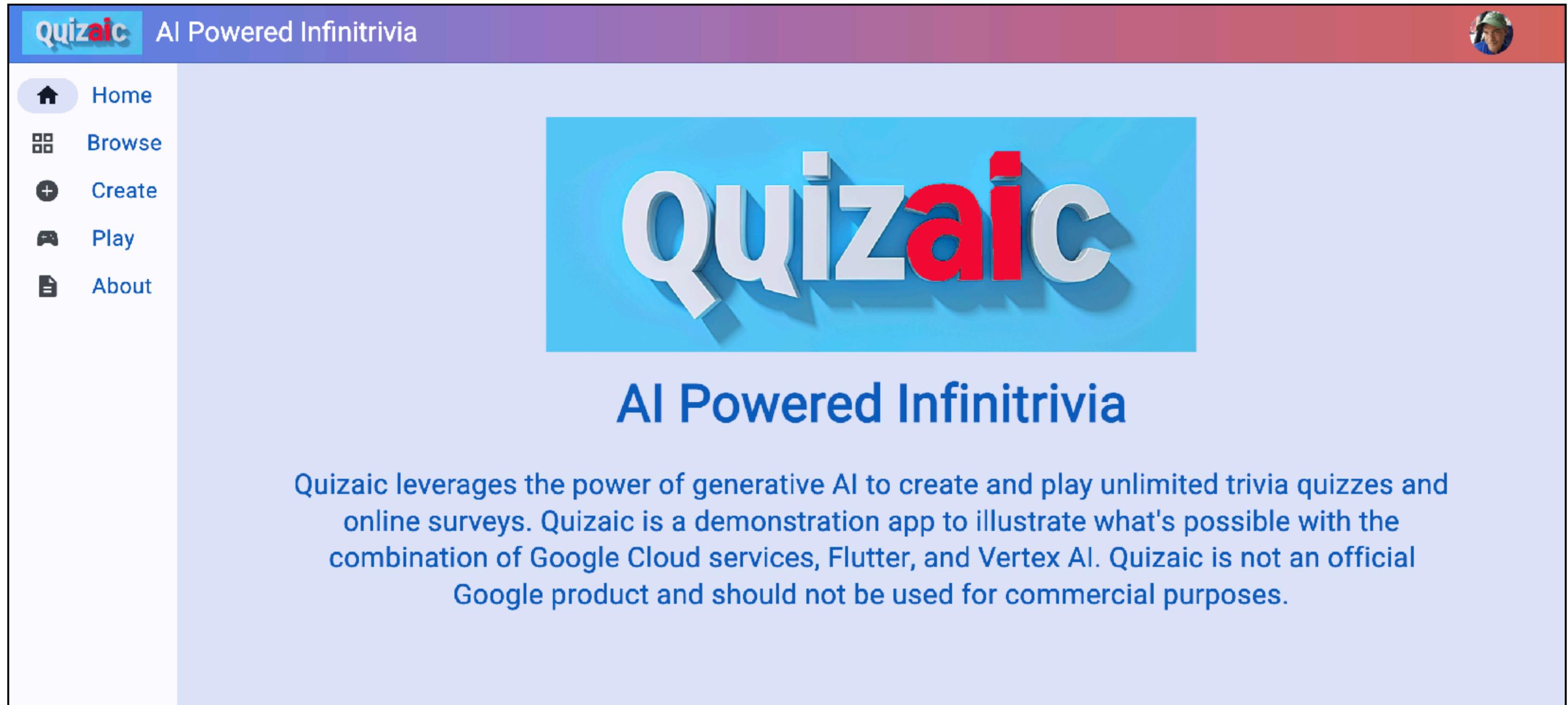
```
1 #!/usr/bin/env ts-node
2
3 import { fetch } from "fetch-h2";
4
5 // Determine whether the sentiment of text is positive
6 // Use a web service
7 async function isPositive(text: string): Promise<boolean> {
8   const response = await fetch(`http://text-processing.com/api/sentiment/`, {
9     method: "POST",
10    body: `text=${text}`,
11    headers: {
12      "Content-Type": "application/x-www-form-urlencoded",
13    },
14  });
15   const json = await response.json();
16   return json.label === "pos";
17 }
```

The logo for 'Quizaiic' is displayed in a 3D, blocky font. The letters 'q', 'u', 'i', 'z', and 'c' are white, while the letters 'a', 'i', and 'i' are red. The text is set against a light blue rectangular background with a subtle pattern of faint, overlapping circles. The entire logo is centered on a solid blue background.

Quizaiic

(pronounced like mosaic)

Let's play!



Early Prompt

Generate a {num_questions} multiple choice quiz questions based on category {topic}.

Generate a {num_questions} multiple choice quiz questions **in Swedish** based on category {topic}.

Generate a {num_questions} multiple choice quiz questions based on category {topic} **in Swedish**.

Later Prompt

You are a trivia expert.
Generate a set of multiple choice quiz questions.

Category: {topic}

Quiz difficulty level: {difficulty}

Number of questions: {num_questions}

Number of responses per question: {num_answers}

Quiz language: {language}

RULES:

- Accuracy is critical.
- Each question must have exactly one correct response, selected from the responses array.
- Output should be limited to a json array of questions, each of which is an object containing quoted keys "question", "responses", and "correct".
- Don't return anything other than the json document.

OUTPUT:

A Personal Story

Part 3 - AI as coding agent

Introducing vibe coding in Google AI Studio

Oct 26, 2025
3 min read

We're making it faster and more intuitive than ever to turn your vision into a working, AI-powered app with vibe coding in AI Studio.



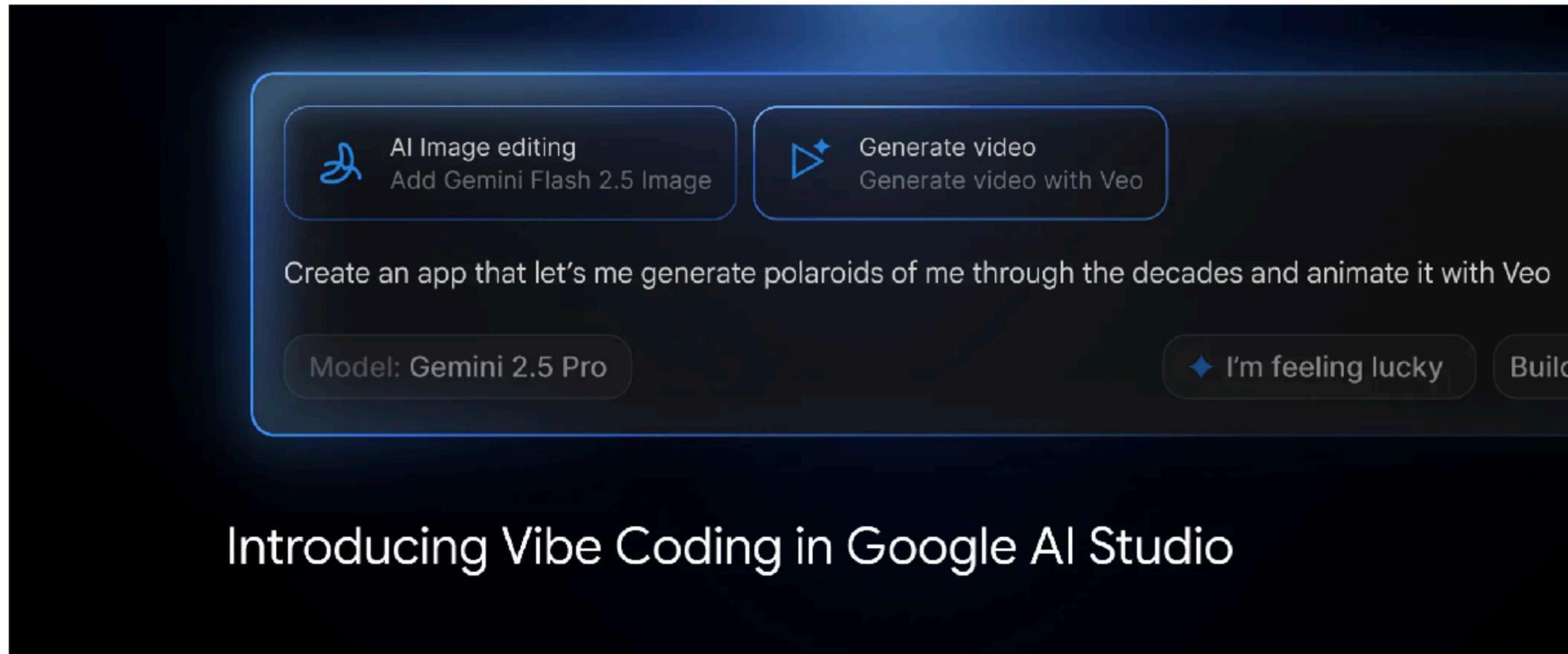
Ammaar Reshi
Product and Design Lead,
Google AI Studio



Kat Kampf
Product Manager, Google AI
Studio

 [Read AI-generated summary](#) 

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Start

Gallery

Your apps

FAQ

Recently viewed

React Hello World

Zenith AI Meditation

React Hello World

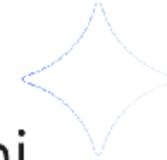
Google AI models may make mistakes, so double-check outputs.

[Get API key](#)

[Settings](#)

[marcacohen@gmail....](#)

Build your ideas with Gemini



Describe your idea

Model: Gemini 2.5 Pro



I'm feeling lucky

Build

Supercharge your apps with AI



Nano banana powered app

Add powerful photo editing to your app. Allow users to add objects, remove backgrounds, or change a photo's style just by typing.



Create conversational voice apps

Use the Gemini Live API to give your app a voice and make your own conversational experiences.



Animate images with Veo

Bring images to life with Veo 3. Let users upload a product photo and turn it into a dynamic video ad, or animate a character's portrait.



Use Google Search data

Connect your app to real-time Google Search results. Build an agent that can discuss current events, cite recent news, or fact-check information.



Use Google Maps data

Connect your app to real-time Google Maps data. Build an agent that can pull information about places, routes, or directions.



Generate images with a prompt

Generate high-quality images from a text prompt. Create blog post heroes, concept art, or unique assets in your application.



Gemini intelligence in your app

Embed Gemini in your app to complete all sorts of tasks - analyze content, make edits, and more



AI powered chatbot

Add a context-aware chatbot to your app. Give your users a support agent that remembers the conversation, perfect for multi-step bookings or troubleshooting.

Definitions

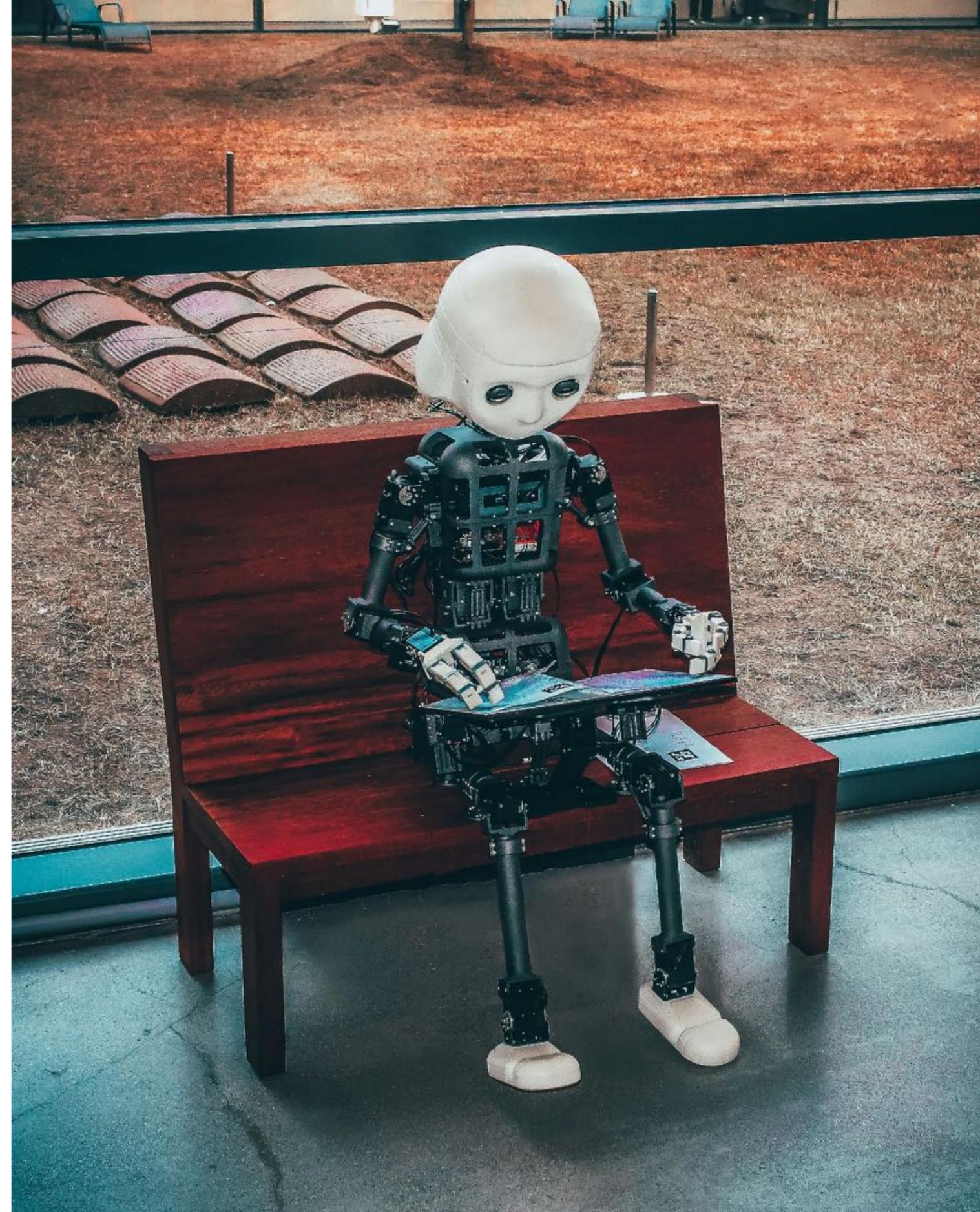
- [Artificial Intelligence](#)
- [Machine Learning](#)
- [Neural Network](#)
- [Deep Learning](#)
- [Generative AI](#)

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estis tute en mal~o^Z; elmeti
mal~on^Z; mal~o min kaptas
malgrasiĝintan vizaĝon de
Rilata al mal~o: fajro de ma
krio^Z. **mal~igi.** Senigi je ~o
ne plu konservas ~on: sen~o
treni sen~an ekzistadon^Z. sen
io sen~a.

★**Esperant/o** (Vd *esper/o*)
Zamenhof okaze de la publikigo
lia lingvoprojekto. **2** (ankaŭ
sengenta, iniciatita de Z., kiu pub

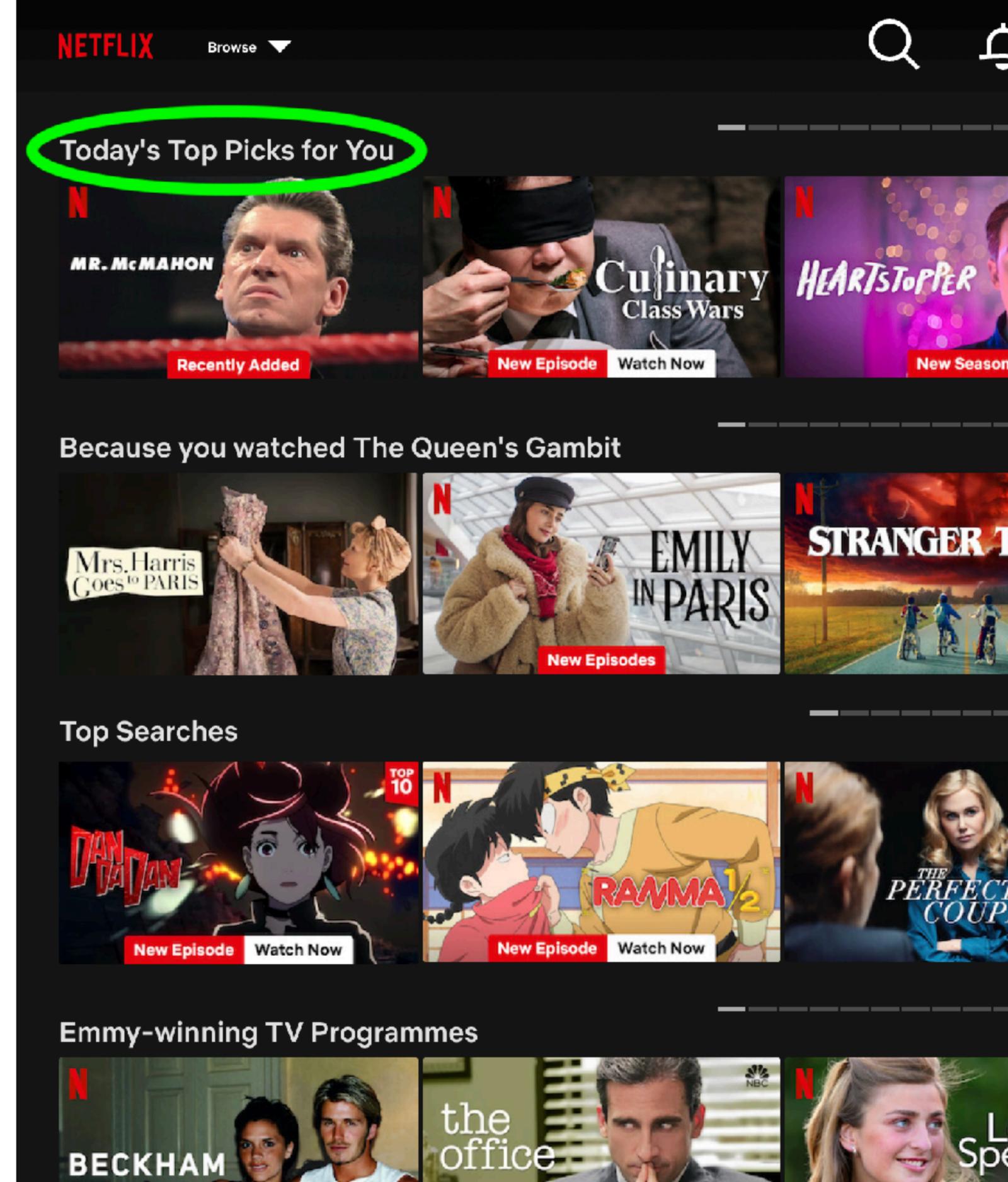
Definition: Artificial Intelligence

The creation of algorithms and systems capable of performing tasks that typically require human cognition, such as learning, reasoning, perception, decision-making, and natural language processing.



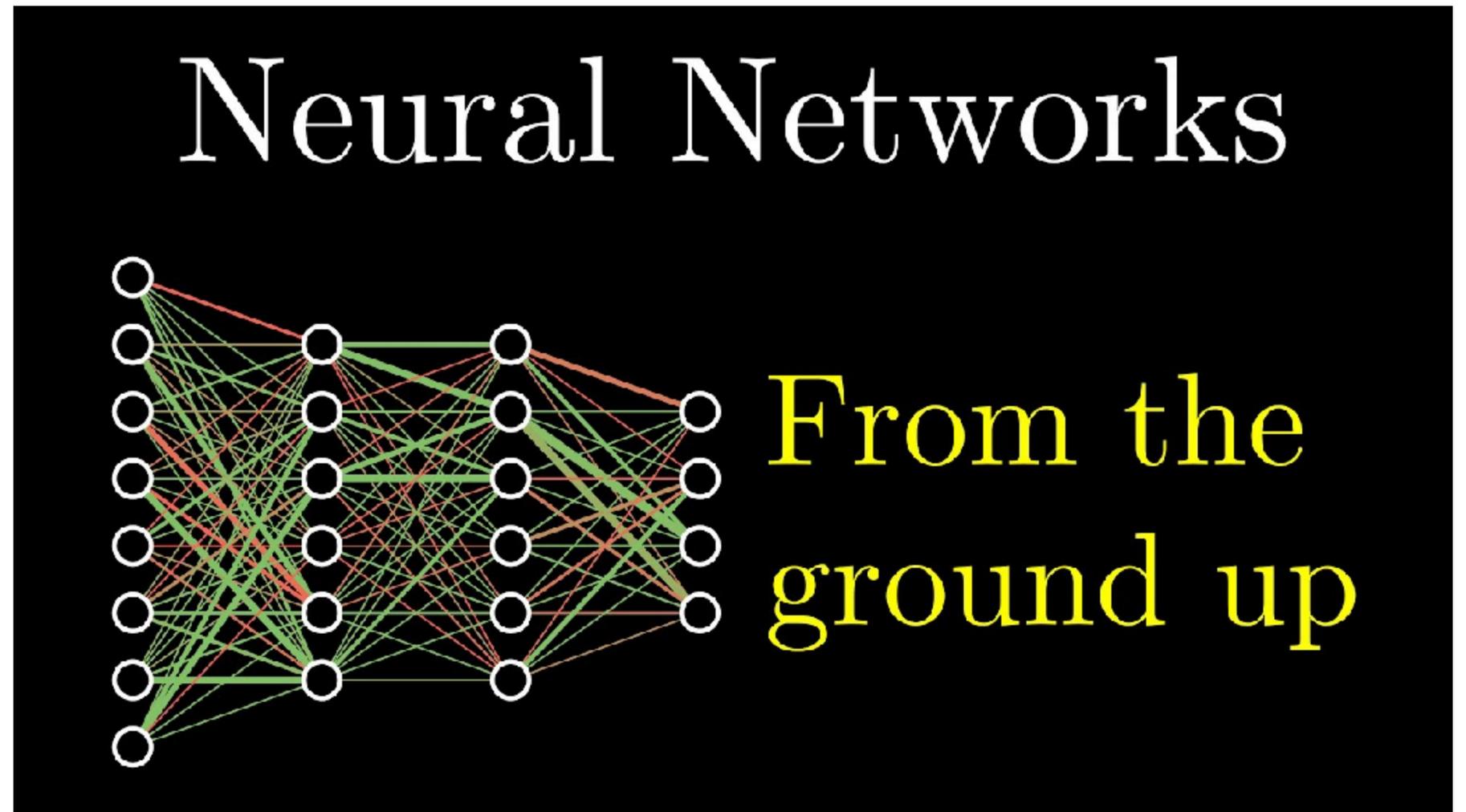
Definition: Machine Learning

The use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyze and draw inferences from patterns in data.



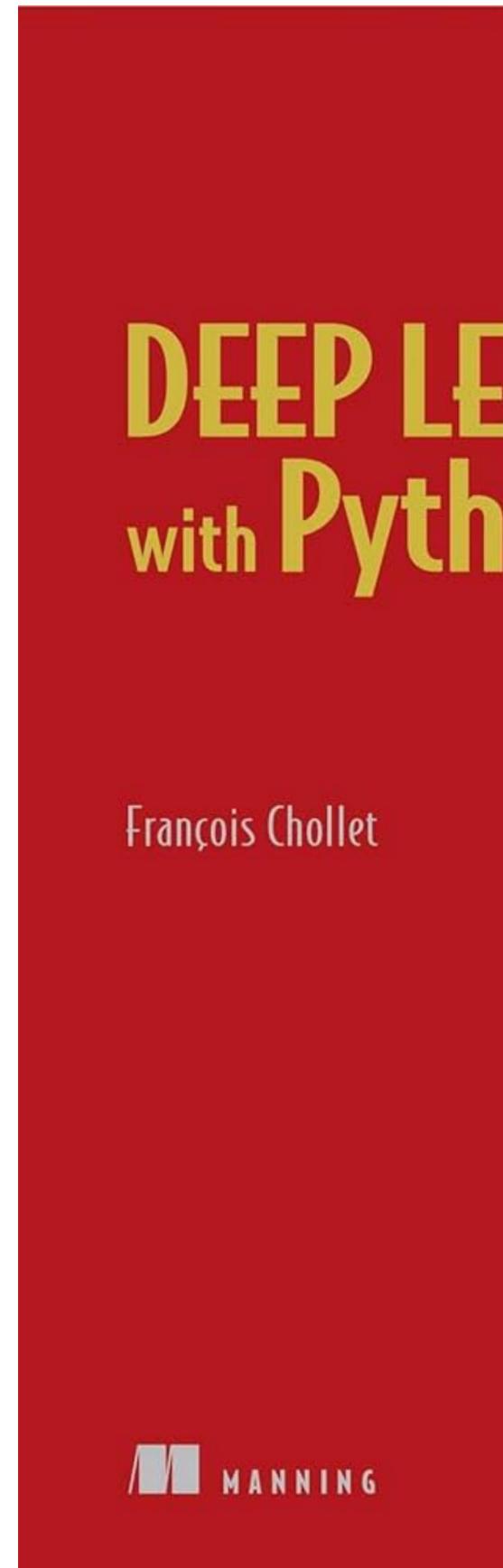
Definition: Neural Networks

A machine learning (ML) technique that uses a network of interconnected layers of nodes to process data in a way that bears some resemblance to the human brain.



Definition: Deep Learning

A type of neural network that uses multiple layers to process data and make human-like decisions. Deep learning systems are “trained” with large amounts of data, including text, images, audio, and video to recognize patterns, make predictions, and automate tasks.



Definition: Generative AI

Deep-learning models that can generate high-quality text, images, video, and other content based on the data they were trained on.



**Artificial
Intelligence**

**Machine
Learning**

**Neural
Networks**

**Deep
Learning**

**Generative
AI**

Artificial Intelligence

Machine Learning

Deep Learning

1950's

1960's

1970's

1980's

1990's

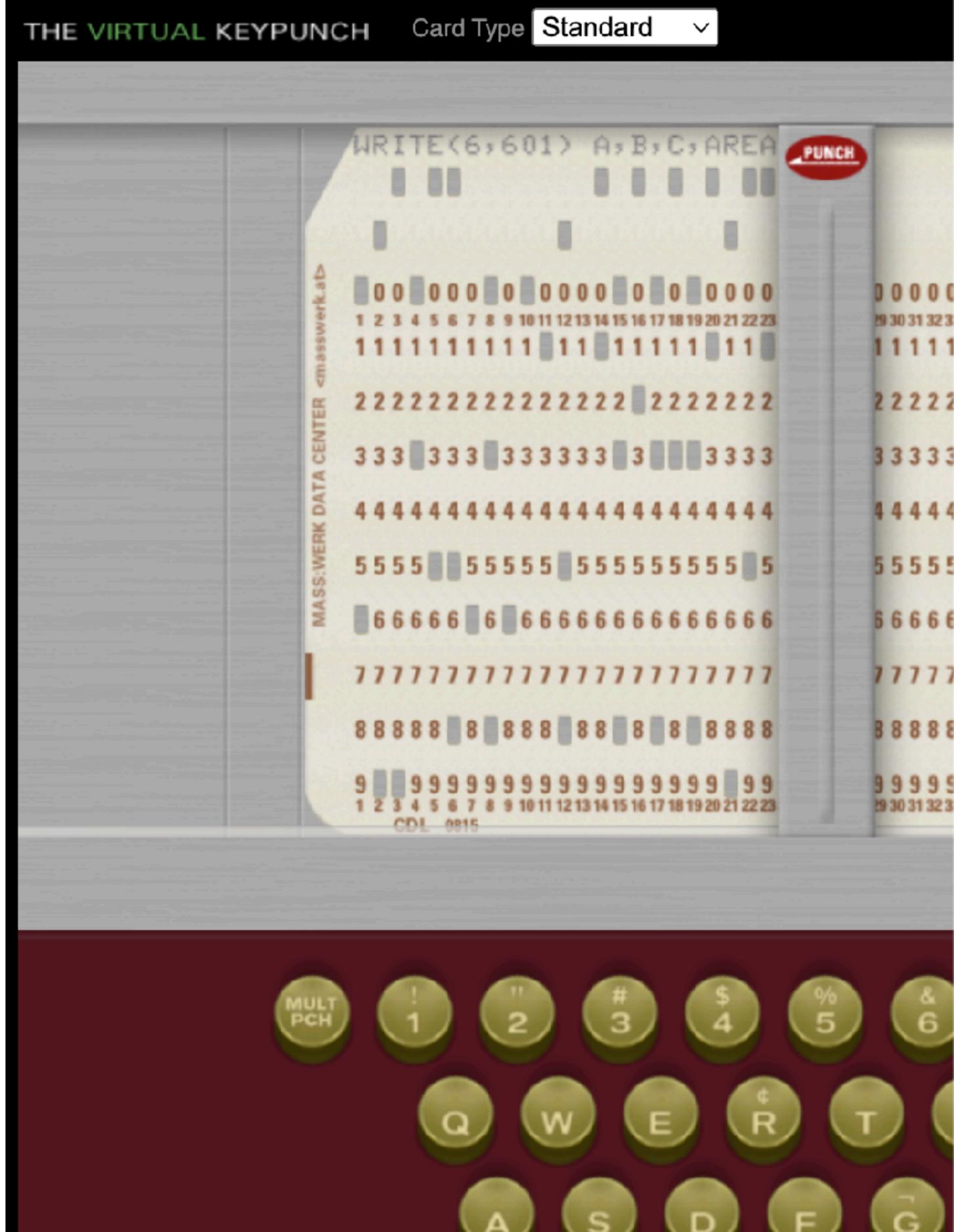
2000's

2010's

AI History

How did we get here?

- [Founders](#)
- [Timeline](#)



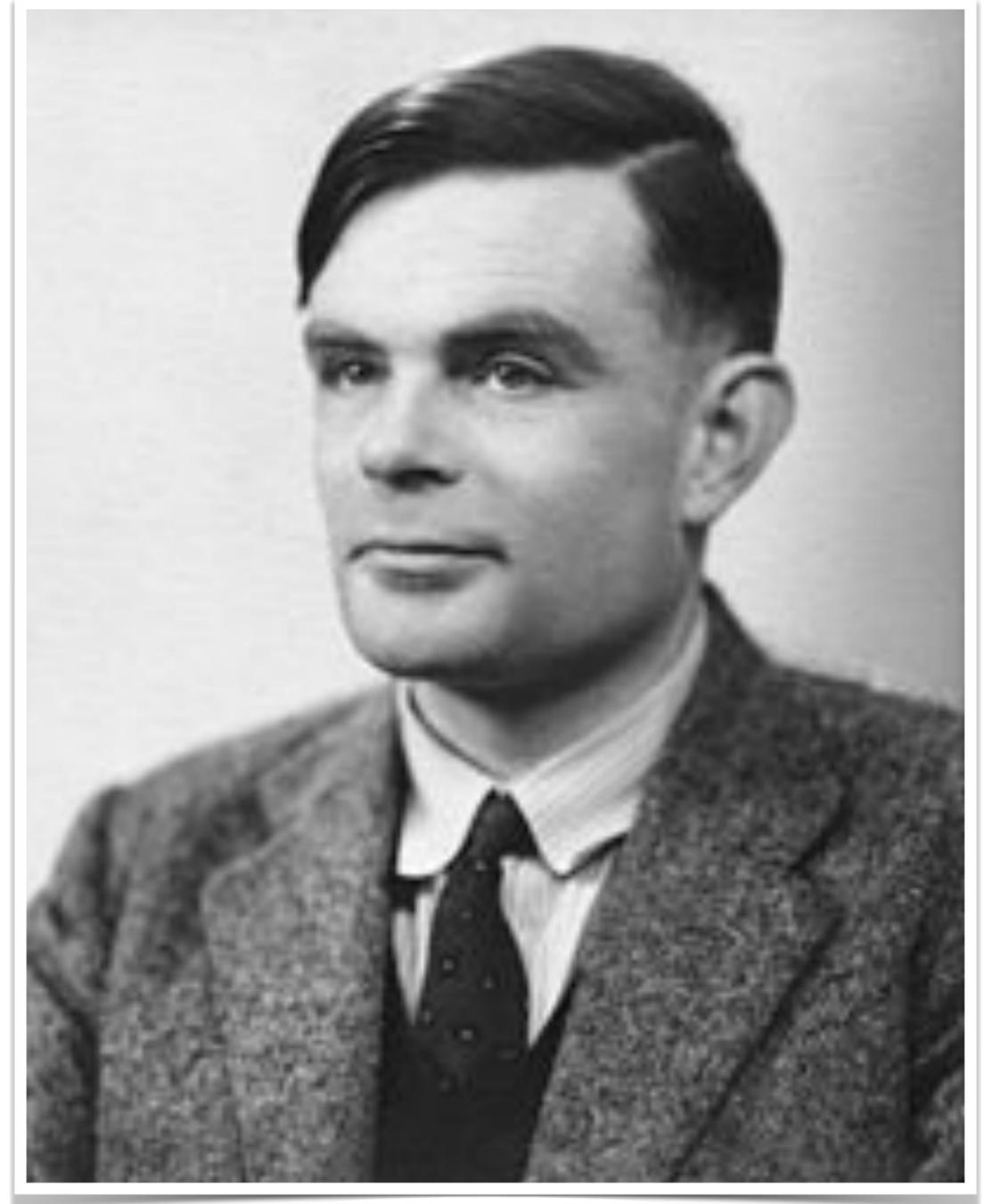
Ada Lovelace

Ada Lovelace (1815–1852) worked with Charles Babbage on his design for the Analytical Engine, a mechanical general-purpose computer that was never built. In her famous notes, she described how such a machine could manipulate symbols according to rules — not just numbers — and even envisioned it creating music or art. This foresight is often seen as a conceptual precursor to computer programming, since she recognized the potential for machines to process abstract patterns beyond calculation.



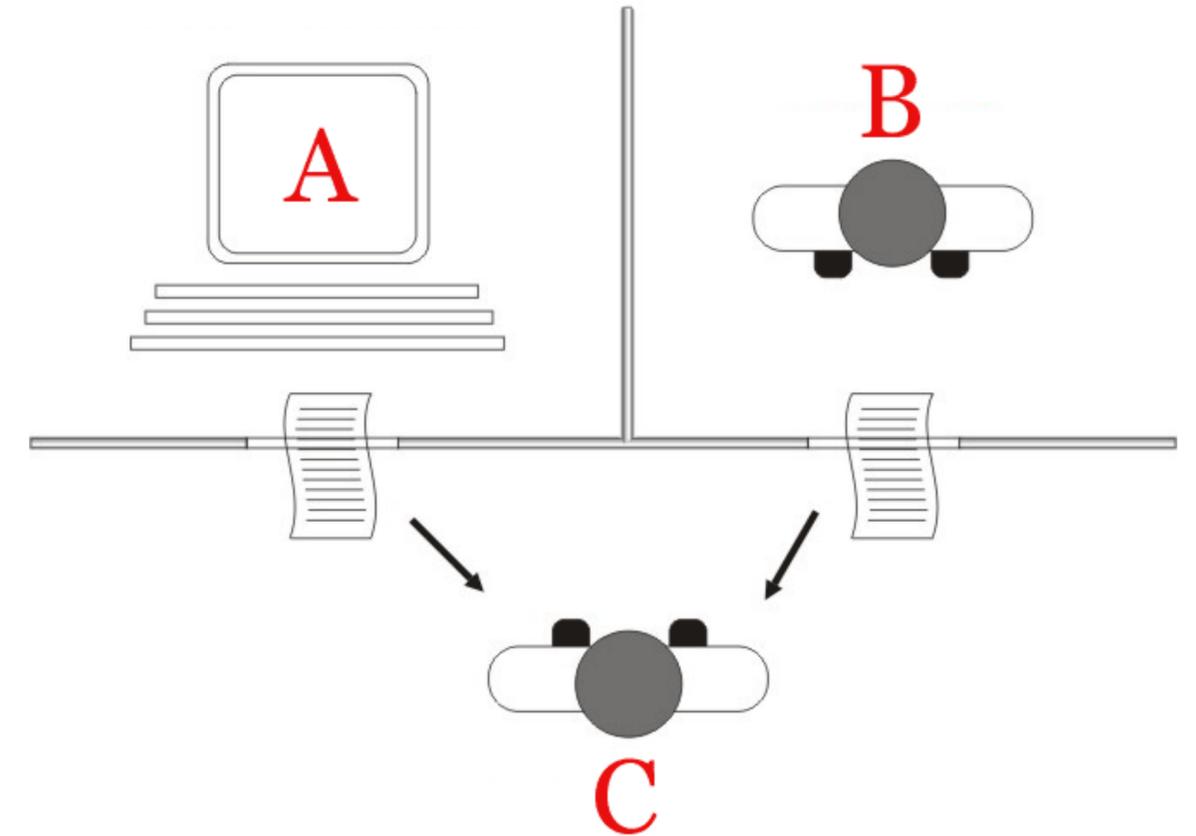
Alan Turing

Alan Turing (1912–1954) laid the theoretical foundations of computer science with his concept of the “universal machine,” showing that a single device could simulate any other computational process. In his 1950 paper “*Computing Machinery and Intelligence*,” he proposed the Imitation Game (now called the Turing Test) as a way to consider machine intelligence. His ideas established core questions about whether and how machines could think, making him one of the intellectual founders of artificial intelligence.



The Turing Test (1950)

If a machine could carry on a conversation that was indistinguishable from a conversation with a human being, then it was reasonable to say that the machine was “thinking”. This was the first serious proposal about how humanity might achieve artificial intelligence.



People cannot distinguish GPT-4 from a human in a Turing test

Cameron R. Jones

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Abstract

We evaluated 3 systems (ELIZA, GPT-3.5 and GPT-4) in a randomized, controlled, and preregistered Turing test. Human participants had a 5 minute conversation with either a human or an AI, and judged whether or not they thought their interlocutor was human. GPT-4 was judged to be a human 54% of the time, outperforming ELIZA (22%) but lagging behind actual humans (67%). The results provide the first robust empirical demonstration that any artificial system passes an interactive 2-player Turing test. The results have implications for debates around machine intelligence and, more urgently, suggest that deception by current AI systems may go undetected. Analysis of participants' strategies and reasoning suggests that stylistic and socio-emotional factors play a larger role in passing the Turing test than traditional notions of intelligence.

How Did You Do On The AI Art Turing Test?

...

NOV 20, 2024

♡ 371 💬 623 ↻ 37

Share

...

Last month, I [challenged](#) 11,000 people to classify fifty pictures as either human art or AI-generated images.

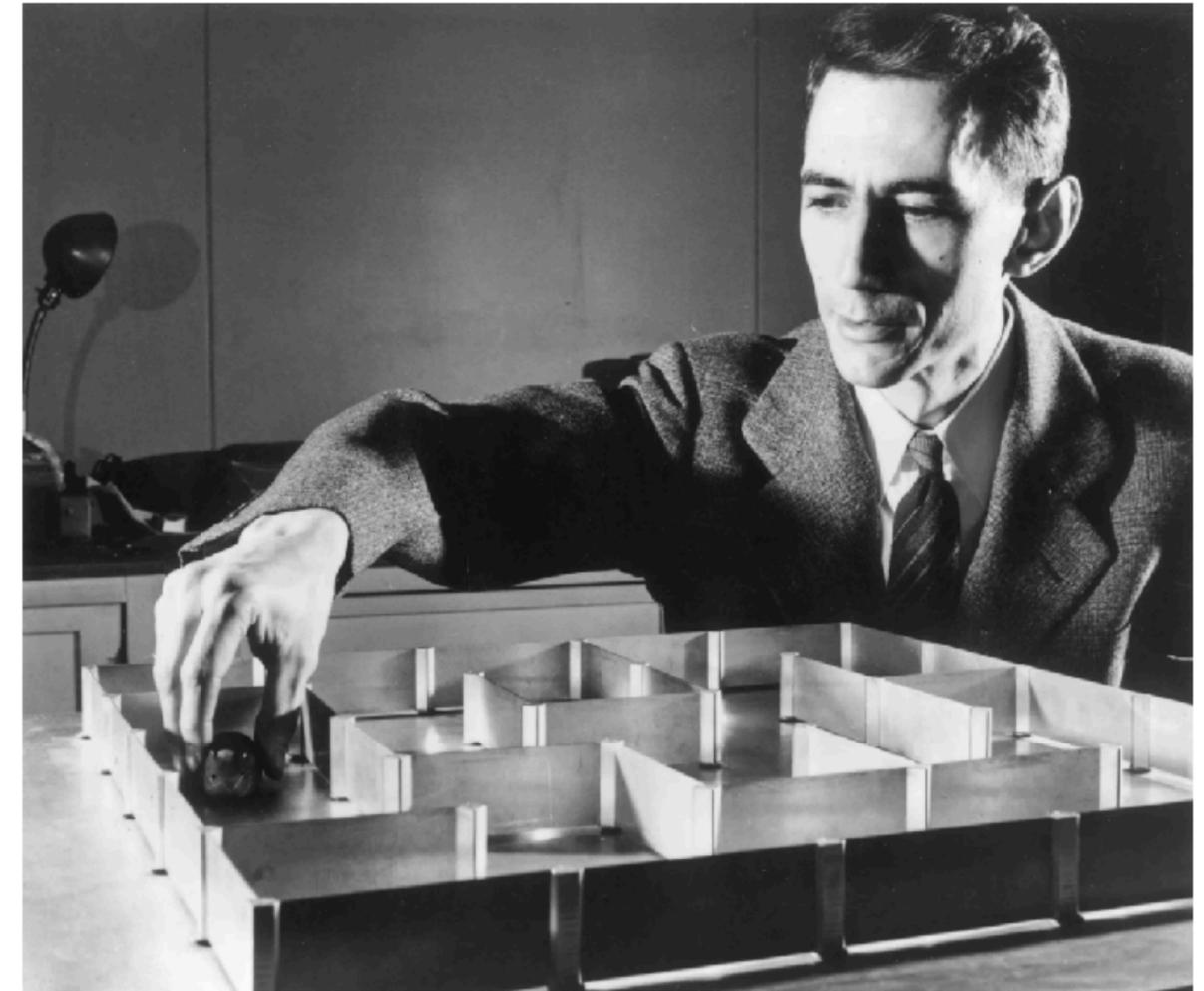
I originally planned five human and five AI pictures in each of four styles: Renaissance, 19th Century, Abstract/Modern, and Digital, for a total of forty. After receiving many exceptionally good submissions from local AI artists, I fudged a little and made it fifty. The final set included paintings by Domenichino, Gauguin, Basquiat, and others, plus a host of digital artists and AI hobbyists.



One of these two pretty hillsides is by one of history's greatest artists. The other is soulless AI slop. Can you tell which is which?

Claude Shannon

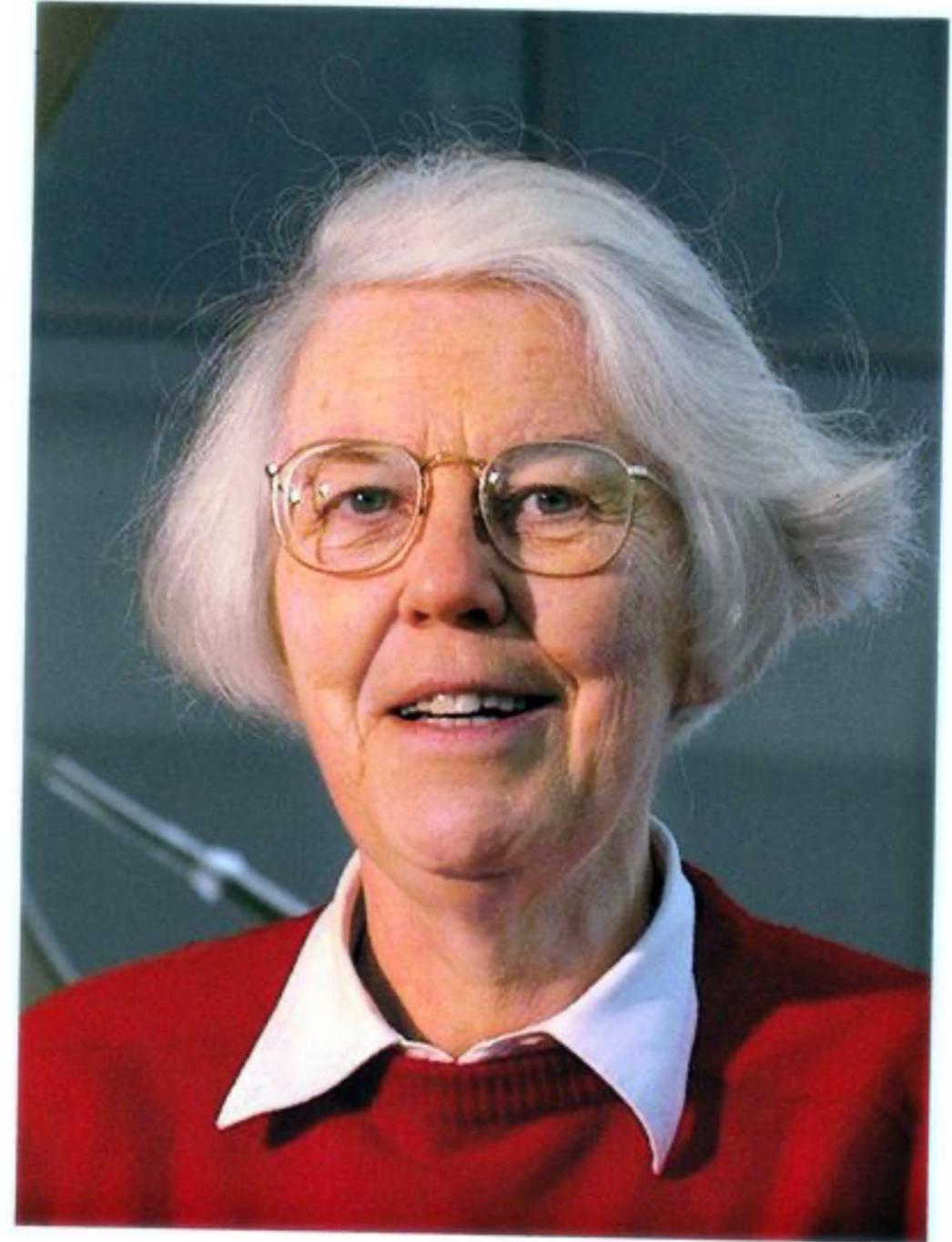
Claude Shannon (1916–2001), often called the “father of information theory,” laid the groundwork for modern digital communication and data processing. His 1948 paper defined concepts like *bits* and *entropy*, enabling the mathematical treatment of information and uncertainty. His theories on communication and symbolic processing directly influenced early artificial intelligence, machine learning, and pattern recognition.



In the early 1950s Claude Shannon designed a mechanical mouse named “Theseus” that could navigate a maze in an early demonstration of artificial intelligence. Source: [Wikipedia](#).

Karen Spärck Jones

Karen Spärck Jones (1935–2007) was a pioneering computer scientist in natural language processing and information retrieval. She introduced the concept of *inverse document frequency (IDF)*, which, combined with term frequency, became the foundation of modern search engines. Her work made it possible for computers to rank documents by relevance.



Geoffrey Hinton

Geoffrey Hinton (b. 1947) is widely known as the “godfather of deep learning” for his pioneering work on artificial neural networks. He helped popularize the backpropagation algorithm in the 1980s, showing how multiple layers of representations could be learned. His group’s success with *AlexNet* in the 2012 ImageNet competition demonstrated the power of deep learning, sparking today’s revolution in computer vision, natural language processing, and generative AI.



Demis Hassabis

Demis Hassabis (b. 1976) is the co-founder and CEO of DeepMind, a leading AI research company acquired by Google in 2014. Trained as both a neuroscientist and computer scientist, he pushed for biologically inspired approaches to AI, leading to breakthroughs such as **AlphaGo** and **AlphaFold**. His leadership has made DeepMind central to advancing deep reinforcement learning and AI for scientific discovery.



AlphaGo Documentary



0:00 - 2:00

AlphaFold Documentary



AI Development Timeline

Charles Babbage & Ada Lovelace design the Analytical Engine, an early mechanical general-purpose computer.

1836

Alan Turing publishes "Computing Machinery and Intelligence," introducing the Turing Test.

1950

Arthur Samuel developed a program to play checkers, which is the first to ever learn the game independently.

1952

John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon organize the Dartmouth Conference, coining the term "Artificial Intelligence."

1956

John McCarthy created LISP, the first programming language for AI research, which is still in popular use to this day.

1958

Arthur Samuel created the term "machine learning" in a speech about teaching machines to play chess better than the humans who programmed them.

1959

AI Development Timeline

Edward Feigenbaum and Joshua Lederberg created the first “expert system” to replicate the decision-making abilities of human experts.

1965

1965

Joseph Weizenbaum created the first “chatterbot” (later shortened to chatbot), ELIZA, a mock psychotherapist, that used natural language processing (NLP) to converse with humans.

The first AI winter begins as funding and interest decline due to unmet expectations.

1972

1974

Marvin Minsky and Seymour Papert publish Perceptrons, highlighting limitations in neural networks.

The resurgence of AI interest due to expert systems like MYCIN (medical diagnosis) and DENDRAL (chemical analysis).

1980

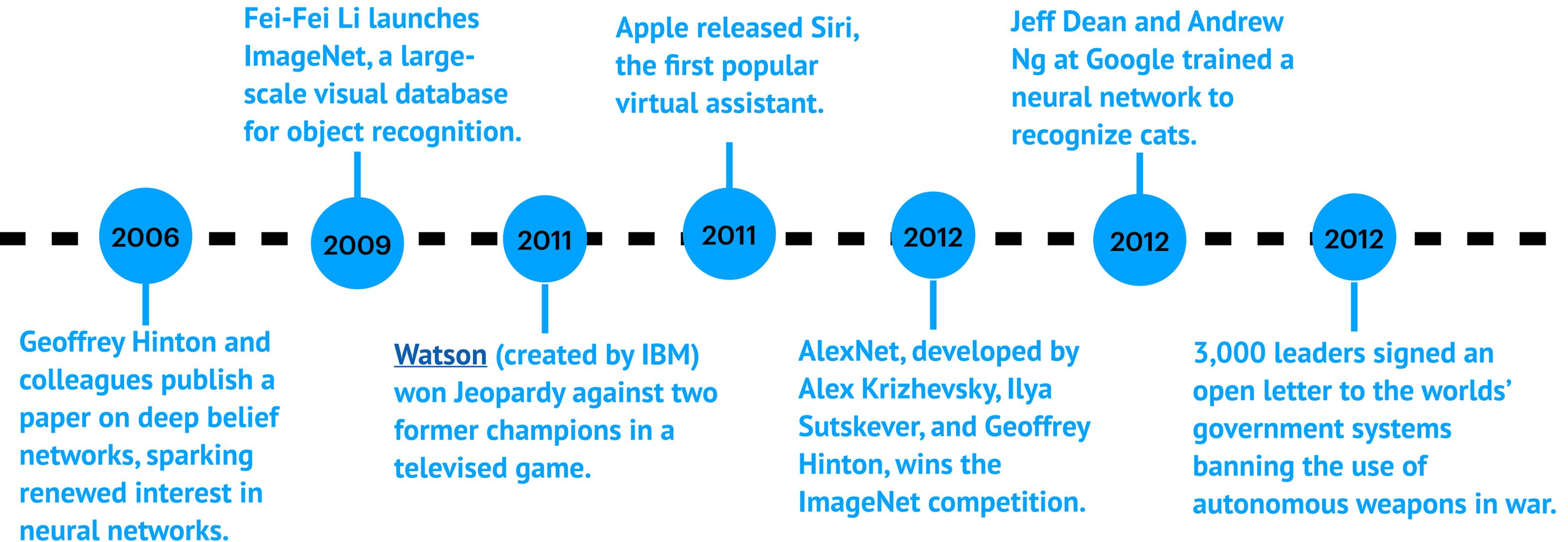
1986

David Rumelhart, Geoffrey Hinton, and Ronald Williams publish the backpropagation algorithm, revitalizing neural networks.

IBM's Deep Blue defeats world chess champion Garry Kasparov.

1997

AI Development Timeline



AI Development Timeline

DeepMind's AlphaGo defeats professional Go player Lee Sedol.

2015

Two Facebook chatbots converse and learn how to negotiate and developed their own shorthand language, completely autonomously.

2017

Google publishes "Attention is all you need", unveiling the Transformer.

2017

Chinese Alibaba beat humans on Stanford reading and comprehension test.

2018

OpenAI releases GPT-3, a powerful language model with 175 billion parameters.

2020

DeepMind's AlphaFold makes significant progress in protein folding.

2020

Generative AI goes mainstream with ChatGPT

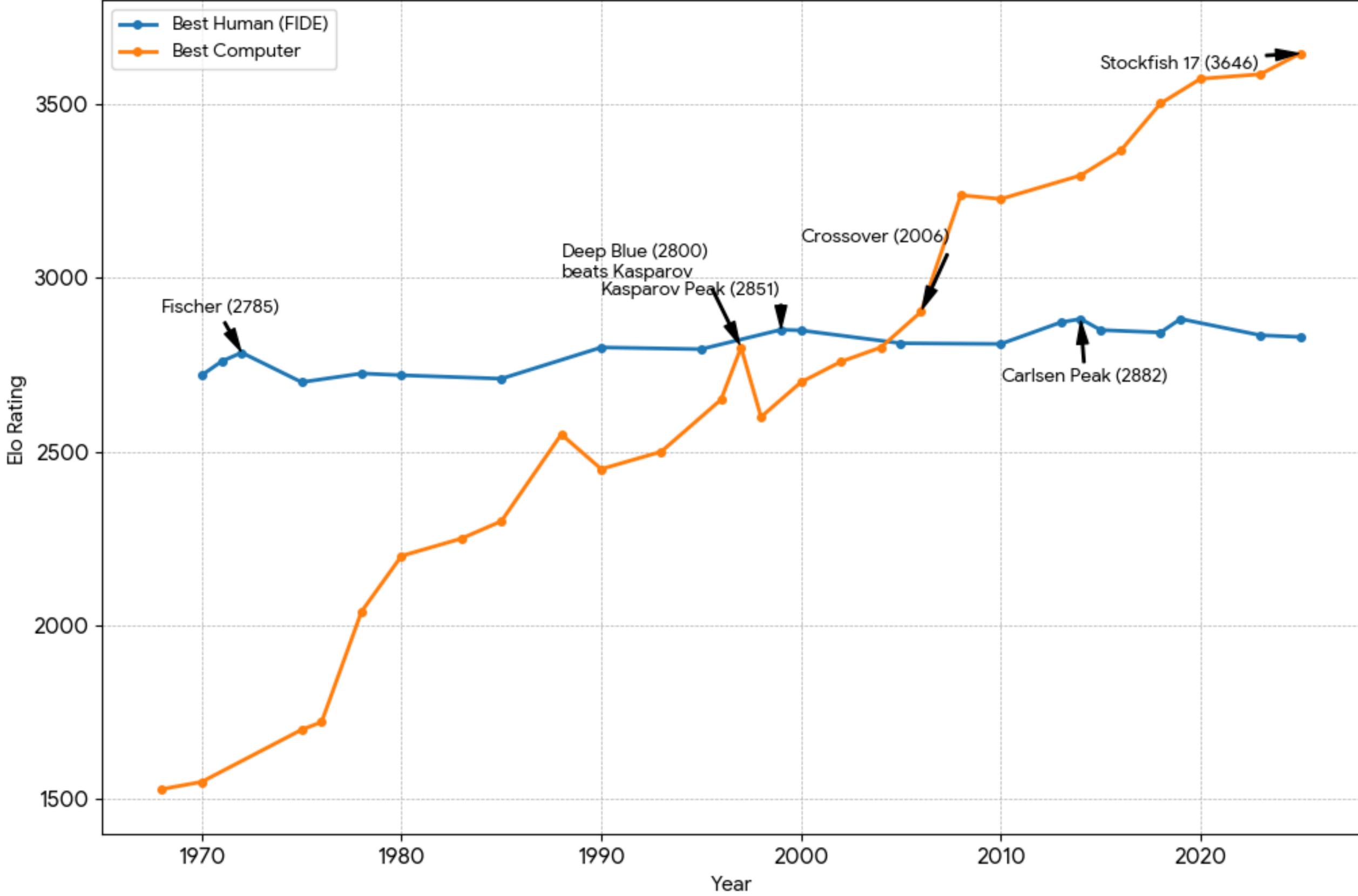
2022

Open source AI era begins

2024



Best Human vs Best Computer Chess Ratings (Elo) Over Time



Google's AI Awakening



[Sign in / Sign up](#)



Jun Rekimoto : 曆本純一

[Follow](#)

人間とテクノロジーの未来を探求しています。

Nov 11, 2016 · 5 min read



You seem to have made it into a neural network Try the beginning with The Great Gatsby Google Translate

ニューラルネット化したらしいGoogle翻訳でThe Great Gatsby冒頭を試してみる：

原文：In my younger and more vulnerable years my father gave me some advice that I've been turning over in my mind ever since.

“Whenever you feel like criticizing any one,” he told me, “just remember that all the people in this world haven’t had the advantages that you’ve had.”

google：私の若くて傷つきやすい年の頃、私の父は私が私の心の中でそれ以来変わってきたアドバイスを私にくれました。

「誰かを批判する気持ちがあるときはいつでも、彼は私に言いました。

「この世界のすべての人々はあなたが持っていた優位性を持っていないことを覚えておいてください。」



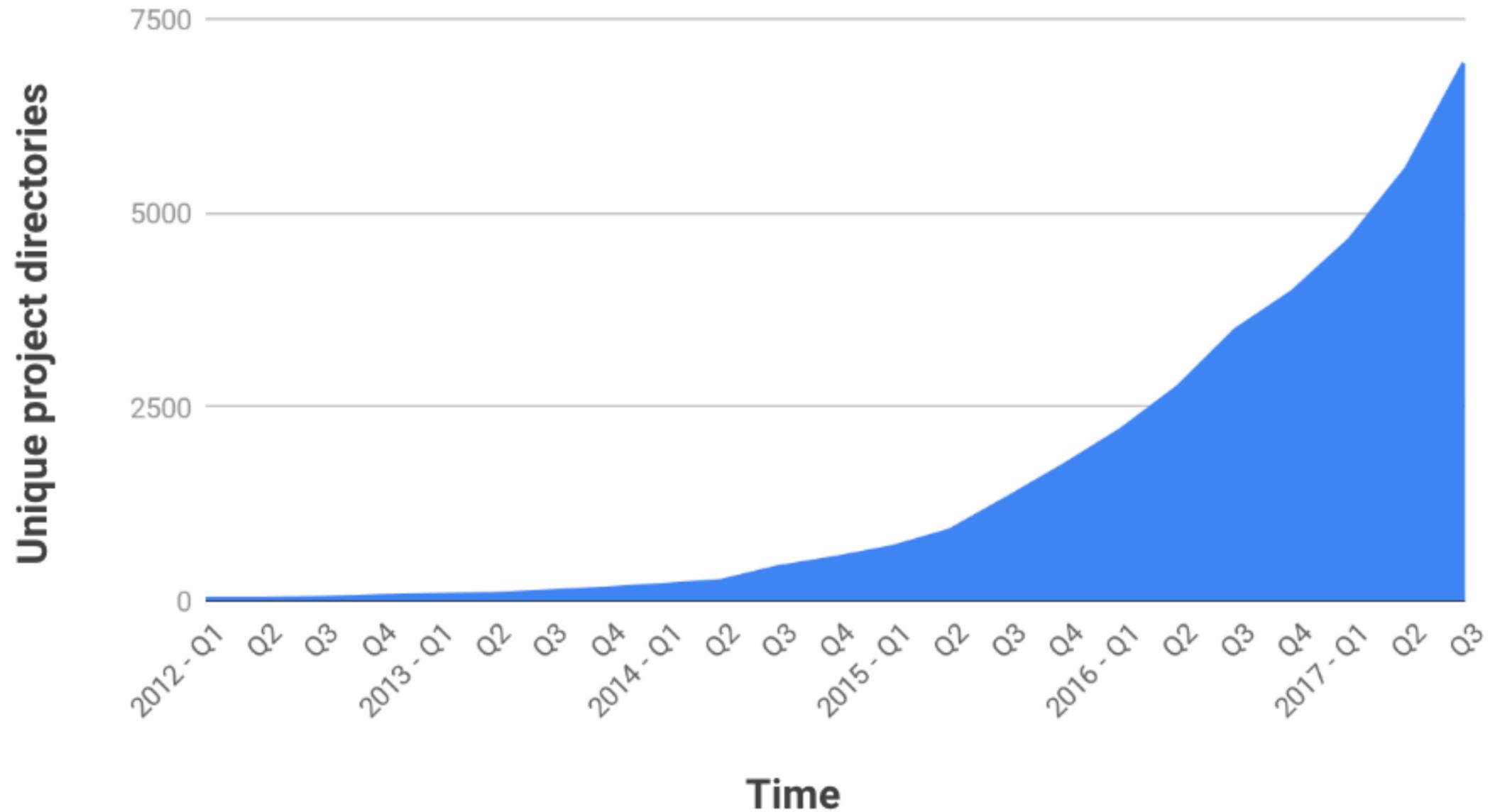
FEATURE

The Great A.I. Awakening

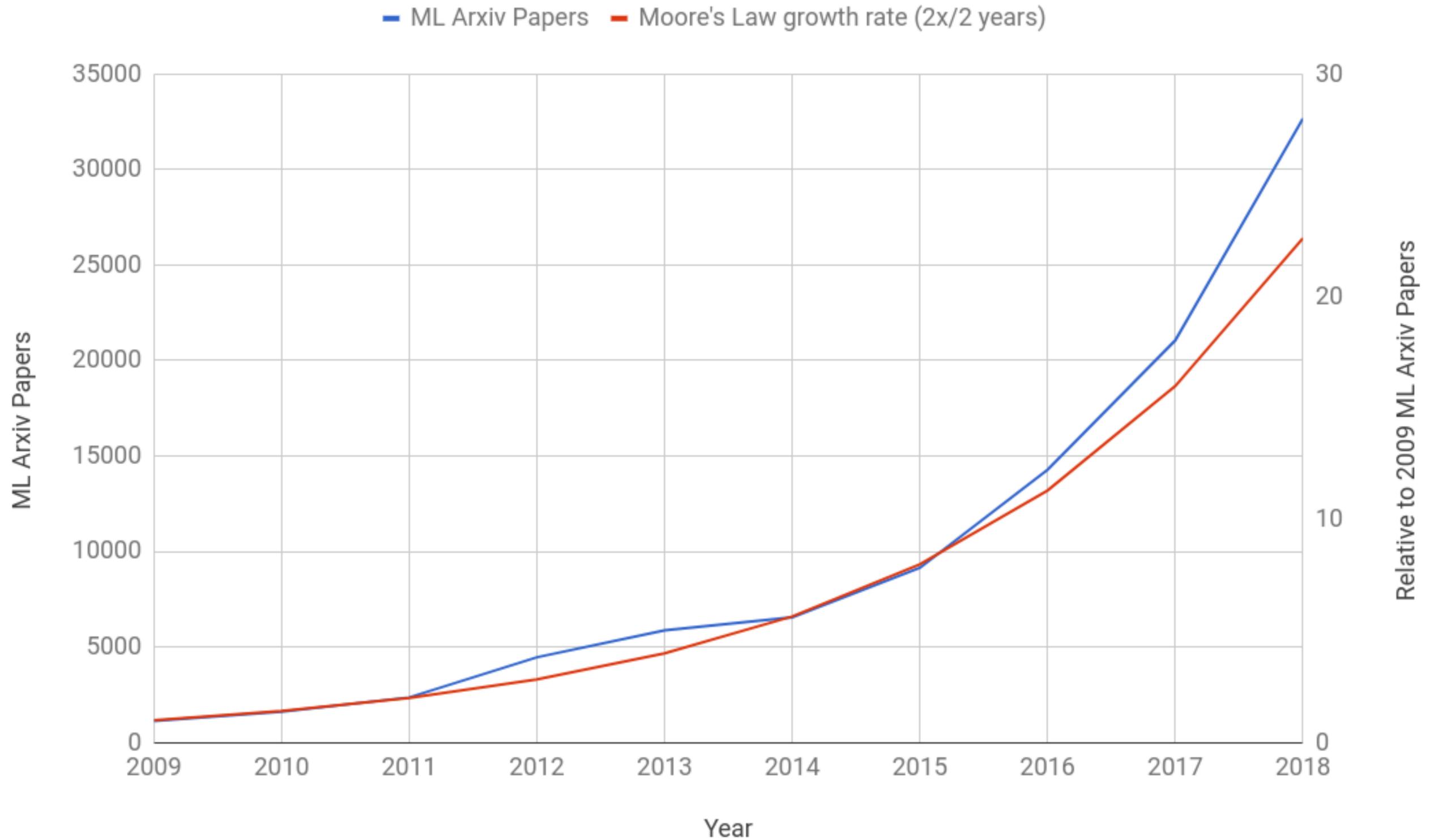
How Google used artificial intelligence to transform Google Translate, one of its more popular services — and how machine learning is poised to reinvent computing itself.

Use of Deep Learning at Google

source directories containing deep learning models

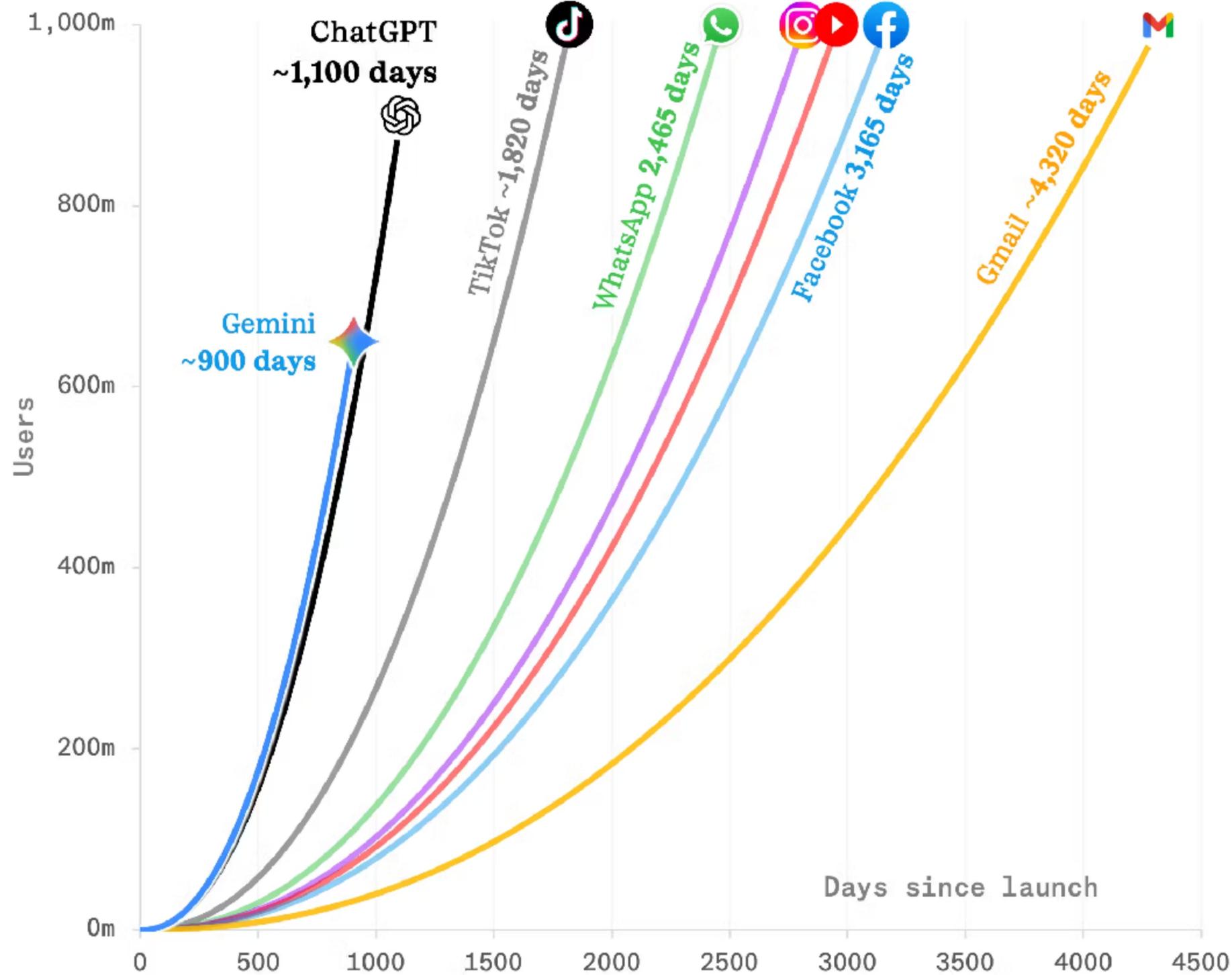


Industry Adoption



The Rapid Rise Of AI Chatbots

Stylized Path to 1 Billion Users* [# of days from launch, only 1 datapoint plotted each]



Nvidia Is Now Worth \$5 Trillion as It Consolidates Power in A.I. Boom

The A.I. chip maker has become a linchpin in the Trump administration's trade negotiations in Asia.

▶ Listen to this article • 9:05 min [Learn more](#) Share full article 233



“Spending on data centers, which are filled with the company’s chips, accounted for 92 percent of the country’s gross domestic product growth in the first half of the year...”



Source: Factset. Keith Collins/The New York Times

Why did everything change so quickly?

A perfect storm:

- **Moore's Law**
- **GPUs**
- **Cloud Computing**
- **Data abundance**
- **Github + Open Source**
- **New & improved techniques**
- **Transformers**



AI's Dial-Up Era



NOWFAL KHADAR

OCT 17, 2025



56



13



20

Share



“Even with all the intelligence, both natural and artificial, no one can predict with certainty what our AI future will look like. Not the tech CEOs, not the AI researchers, and certainly not some random guy pontificating on the internet. But whether we get the details right or not, our AI future is loading.”

Demos & Exercises

A new era of intelligence with Gemini 3

Nov 18, 2025
15 min read

Gemini 3 is our most intelligent model that helps you bring any idea to life.



Sundar Pichai
CEO, Google and
Alphabet



Demis Hassabis
CEO, Google DeepMind



Koray Kavukcuoglu
CTO, Google DeepMind
and Chief AI Architect,
Google

 Share

 Read AI-generated summary 



Gemini 3.1 Pro: A smarter model for your most complex tasks

Feb 19, 2026
4 min read

3.1 Pro is designed for tasks where a simple answer isn't enough.



The Gemini Team

 Read AI-generated summary 

 Share



Which service(s) should I use?

Service	Best For	Cost (Monthly)	Positives	Negatives
ChatGPT	General Use & Creativity	Free / \$20	<ul style="list-style-type: none">• Highly versatile• Advanced Voice Mode• Custom "GPTs" library	<ul style="list-style-type: none">• Can hallucinate facts• Usage limits on top models• Privacy concerns
Claude	Coding & Writing	Free / \$20	<ul style="list-style-type: none">• Natural, human-like tone• Large context window• "Artifacts" side-panel UI	<ul style="list-style-type: none">• Strict daily message limits• No image generation• Can be overly cautious
Perplexity	Research & Search	Free / \$20	<ul style="list-style-type: none">• Cites real-time sources• Switchable models (Pro)• Excellent for news	<ul style="list-style-type: none">• Dry, factual tone• Poor creative writing• Relies on search results
Gemini	Google Ecosystem	Free / ~\$20	<ul style="list-style-type: none">• Deep Google App integration• Native video/audio analysis• Fast response speed	<ul style="list-style-type: none">• Inconsistent reasoning quality• Web summaries vary• UI feels less polished
Copilot	Office 365 Work	Free / \$20	<ul style="list-style-type: none">• Built into Word/Excel/PPT• Free DALL-E 3 images• Enterprise data security	<ul style="list-style-type: none">• Slow performance• Cluttered interface• Strict content filters

Should I pay for an AI service?

Free

Intelligence for everyday tasks

\$0 / month

[Get Free ↗](#)

- ✓ Advanced reasoning with GPT-5
- ✓ Limited messages and uploads
- ✓ Limited and slower image generation
- ✓ Limited deep research
- ✓ Limited memory and context

Have an existing plan? See [billing help](#)

Plus

More access to advanced intelligence

\$20 / month

[Get Plus ↗](#)

✦ Everything in Free and:

- ✓ Advanced reasoning with GPT-5
- ✓ Expanded messaging and uploads
- ✓ Expanded and faster image creation
- ✓ Expanded deep research and agent mode
- ✓ Expanded memory and context
- ✓ Projects, tasks and custom GPTs
- ✓ Limited access to Sora 1 video generation
- ✓ Codex agent

[Limits apply](#)

Pro

Full access to the best of ChatGPT

\$200 / month

[Get Pro ↗](#)

✦ Everything in Plus and:

- ✓ Pro reasoning with GPT-5
- ✓ Unlimited messages and uploads
- ✓ Unlimited and faster image creation
- ✓ Maximum deep research and agent mode
- ✓ Maximum memory and context
- ✓ Expanded projects, tasks and custom GPTs
- ✓ Extended access to Sora 1 video generation
- ✓ Expanded codex agent
- ✓ Research preview of new features

Unlimited subject to abuse guardrails. [Learn more](#)

Discussion topic:
How are you using AI?

Some guidelines

- **Learn domain-specific best practices**
- **Question everything (play devil's advocate)**
- **Ask for references**
- **Get multiple opinions**
 - **Human plus machine**
 - **Cross-check with other models**

My Usage Examples

Does this look familiar?

What can I help with?

 Message ChatGPT



 Create image

 Summarize text

 Brainstorm

 Code

 Make a plan

More

Google

 |  

Google Search

I'm Feeling Lucky

A Better Google

- **Answers instead of links**
- **No ads! (yet)**

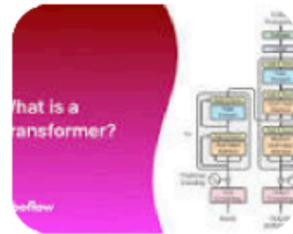
Can you travel from Victoria Station to Clapham Junction with an Oyster Card?

Yes — you *can* travel from Victoria Station to Clapham Junction using an Oyster card (or contactless) on many of the National Rail services that run that route. [Southwestern Railway +2](#)

AI Overview

Learn more

A transformer is a neural network architecture that processes sequential data by learning relationships between elements. Transformers are used in many machine learning applications, including natural language processing (NLP), speech recognition, and computer vision.



Transformers in Artificial Intelligence - AWS

Transformers are a type of neural network architecture that transforms or changes an...

AWS

What Is a Transformer Model? - NVIDIA Blog

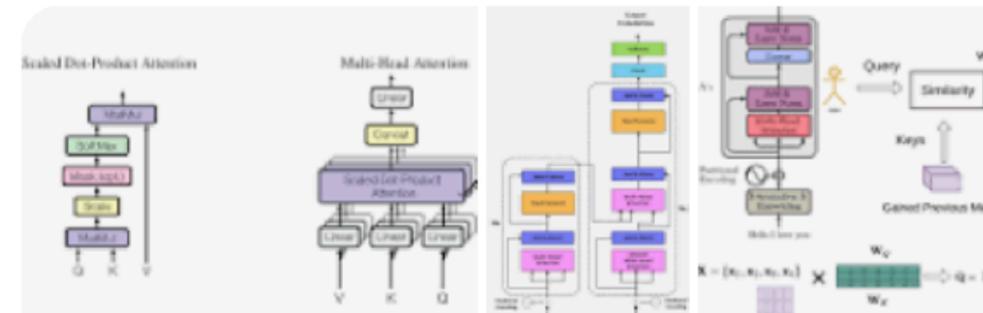
25 Mar 2022 — So, What's a Transformer Model? A transformer model is a neural...

How transformers work

- 1. Transformers learn context by tracking relationships between elements in a sequence.

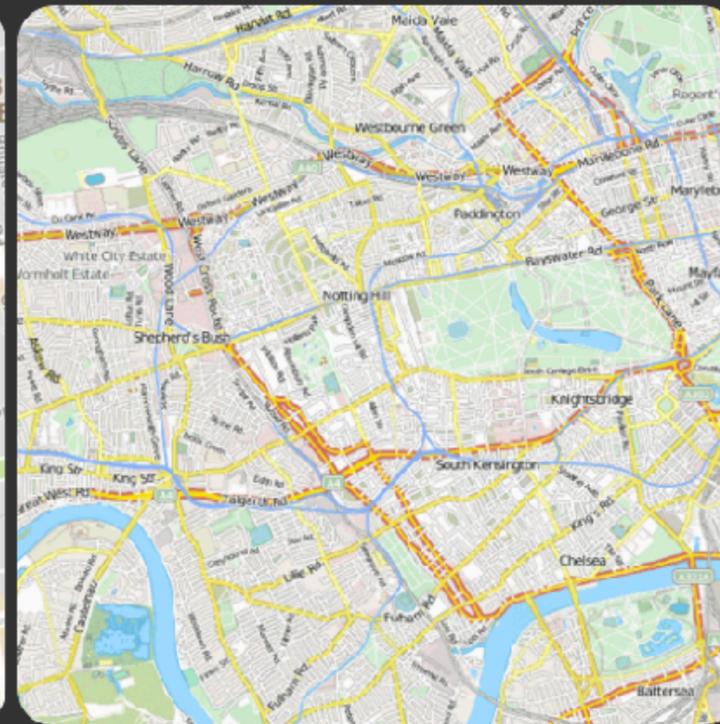
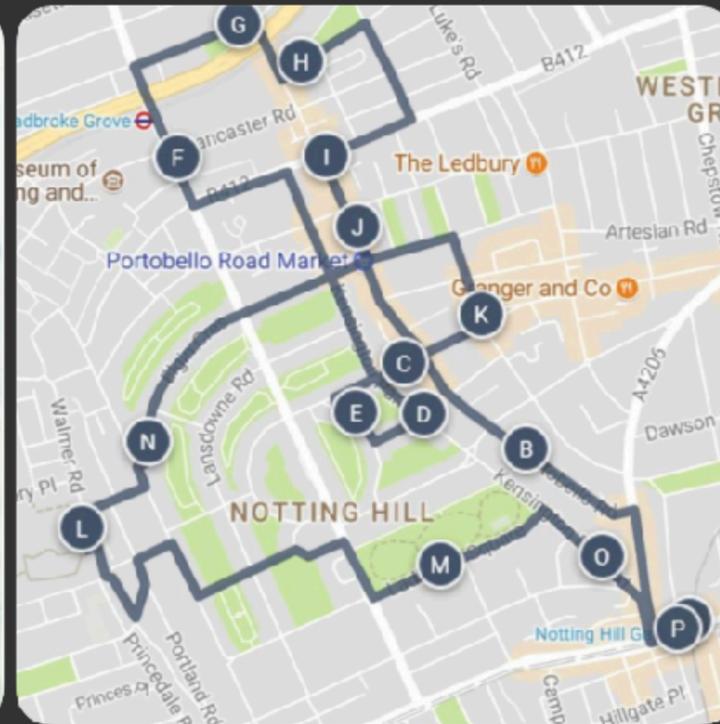
Show more

Transformers are a type of neural network architecture that transforms or changes an input sequence into an output sequence. They do this by learning context and tracking relationships between sequence components.



General Advice

what is the nicest area to walk around, have lunch, shop, etc. in Notting Hill?



Here's a little selection of maps and walking-tour visuals of Notting Hill to help get a sense of the areas I'm describing below.

Caveat Emptor



Thought for 43s >

You're right—my mistake. This is a **MacBook Air**.

Wrong, it's a MacBook air



What model is this laptop

The laptop in your photo is an **Apple MacBook Pro**.

Key identifying features:

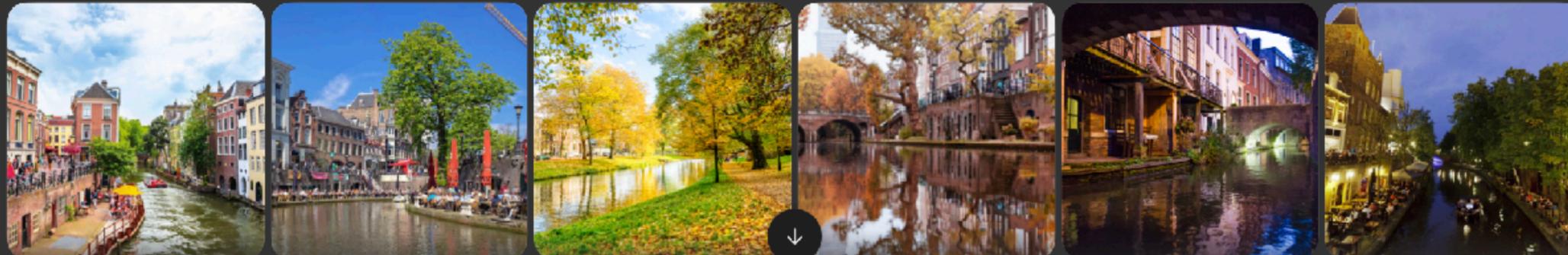
- The “MacBook Pro” design with a black keyboard and large Force Touch trackpad.
- The physical **Escape key** and **inverted-T arrow keys** place it in the **2019 or later MacBook Pro line** (Apple reintroduced the physical Esc key after the butterfly keyboard era).
- The slimmer bezels around the display also indicate it's a newer model.
- Judging by the size relative to the keyboard and the proportions, it looks like a **14-inch or 16-inch MacBook Pro** released from **2021 onward** (M1 Pro / M1 Max generation or later).

Travel Agent

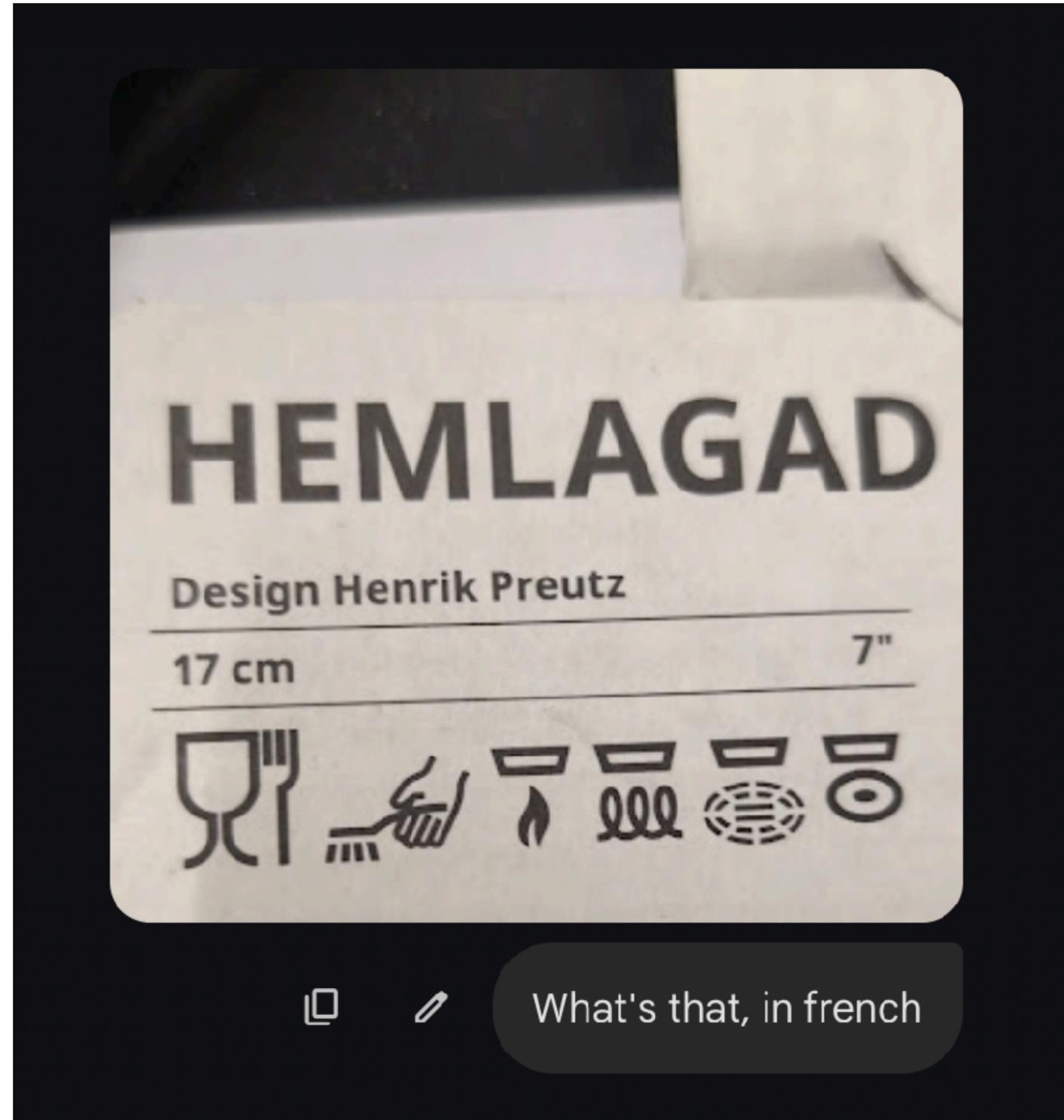
I'll be in Utrecht Nov 21-24, 2025 with a companion. We'll be attending a concert on the evening of the 22nd (John Gorka). I'd like an itinerary for our time there. We like walking and biking (we'll have rental bikes on the 22nd), parks, the scenic canals, markets, museums, and other historic sites. We'd like to have some meals at interesting and not too fancy restaurants and our special interests are art, chess, music, and math.

Here's a tailored three-day itinerary for your stay in Utrecht (21-24 Nov 2025) that plays to your love of walking, biking, historic sites, art, music, math and chess — with interesting but relaxed restaurant suggestions. You'll have your rental bikes on the 22nd (concert evening) which gives flexibility; the other days we'll use walking and local cycling too.

Day 1: Friday 21 Nov — Arrival, evening wander & canal-city charm



LLMS can see!



Second Opinion

Please summarize this article in relatively simple but technical terms and whether you see any actions I should undertake as a 65 year old man with mild CAD.

<https://erictopol.substack.com/p/the-big-shift-in-cardiology-to-atheroma>



Show thinking 

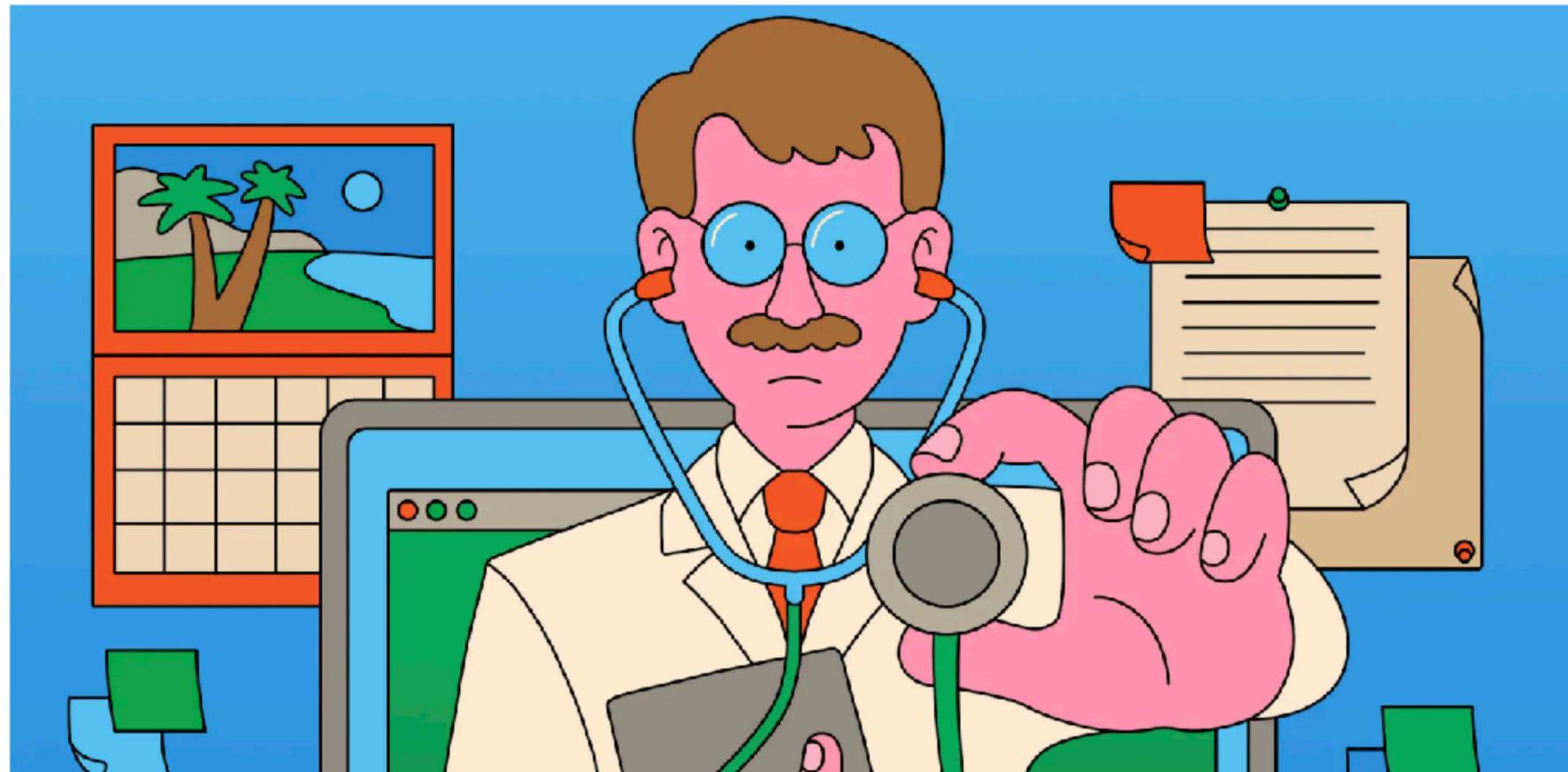
This article by Dr. Eric Topol highlights a major transformation in how cardiologists understand and treat heart disease. Here is a summary of the key points and how they apply to you.

Asking ChatGPT for Medical Advice? Here's How to Do It Safely.

Experts weigh in on the benefits and harms.

 Listen to this article · 7:45 min [Learn more](#)

 Share full article    115



Writing Assistance

👉 Specific suggestions (with rewrites)

Here are some sentence-/paragraph-level suggestions. You can pick/choose what fits.

A. Intro rewrite idea

Current intro (paraphrased):

“Check out this beautifully crafted, inspiring, award-winning short film. It tells the story of Madeleine, a spirited 106 year old woman who reluctantly travels to the beach with her young filmmaker friend.”

Suggested rewrite:

“Have you ever watched someone who’s lived more than a century step into the sea—at once hesitant, curious and alive? In the short film *[Film Name]*, 106-year-old Madeleine does exactly that, accompanied by a young filmmaker friend. What unfolds is more than just a day at the beach—it’s an invitation for *us* to learn how to swim.”

Writing Assistance

A Student's Guide to Writing with ChatGPT



Language Practice

September 25, 2023

ChatGPT can now
see, hear, and speak



These clouds are
caused by ●

Consumer Advice

What's the best small factor fuzz pedal

Great question, Mark! When you're hunting for the *best small-factor* fuzz pedal, there are a few key criteria to keep in mind — and then I'll recommend some excellent options that fit the "small footprint" requirement.

✓ What to look for in a good fuzz pedal

Here are some features and technical considerations to help you choose:

1. **Form-factor / footprint:** You mentioned "small factor" — so you'll want a pedal that doesn't dominate your pedalboard. Compact enclosures, mini versions or "smalls" series are preferable.
2. **Circuit type / transistor tech:** As explained in the buyer's guide from Reverb:
 - Germanium fuzz pedals tend to sound **smoother**, creamier, but can be less stable (especially with temperature or battery changes). [reverb.com +2](#)
 - Silicon fuzz pedals tend to be more stable, brighter, and more aggressive. [reverb.com +1](#)So pick a character you like.

Personal IT Expert

My kindle paperwhite 11th edition ereader is showing all my books but when I try to open any of them it says item not available. I check the website and it looks like a lot of my content is missing

Got it — frustrating situation, but I can help you troubleshoot. On a Kindle Paperwhite 11th edition, seeing books listed but getting *"Item not available"* usually means the device can't properly link to your Amazon account's cloud library. Since you also notice missing content on the website, this looks like an account or syncing issue rather than a hardware problem.

Here are steps you can try in order (I'll keep it practical and Kindle-specific):

Financial Expert

How much will I get for my UK state pension, if I max out the contributions?

Good question — let's go through this clearly and precisely.

🇬🇧 The UK State Pension (2025–26 rules)

If you “max out” your National Insurance (NI) contributions — i.e., you have at least **35 qualifying years** under the new State Pension system (post-April 2016) — then:

- Full new State Pension (2025–26): **£221.20 per week**
- That's about **£11,510 per year**.

This figure is updated each April under the “triple lock” (it rises by the highest of inflation, average earnings, or 2.5%). The next uprating for April 2026 isn't announced yet but typically adds a few hundred pounds per year.

Video Summarization

Gemini ▾

Try Gemini Advanced



Gemini was just updated. [See update](#)



summarize this video: https://www.youtube.com/watch?v=UvObKRaxZ_Q

Regenerate draft ↻



YouTube ▾

This video is about the privacy threats of artificial intelligence (AI).

AI is being used to collect and track people's data. This data is then used for targeted advertising, identity theft, and other malicious purposes. The Biden Administration has recently unveiled a blueprint for an AI Bill of Rights to protect people's personal data and limit surveillance.

Cybersecurity analyst Julio Rivera believes that AI poses a serious threat to privacy. He says that people are living online and opting into data collection without realizing the risks. He also says that the government is collecting data on people's conversations and monitoring their homes.

The AI Bill of Rights has five core principles: safe and effective systems, prevention of algorithmic discrimination, data privacy, proper notice and explanation, and alternative options. Rivera believes that the bill is a good start but that it needs to be implemented carefully. He also warns that AI will continue to evolve and that there will be new threats to privacy in the years ahead.

by

Learning

How generative AI expands curiosity and understanding with LearnLM

May 14, 2024

8 min read

LearnLM is our new family of models fine-tuned for learning, and grounded in educational research to make teaching and learning experiences more active, personal and engaging.



Ben Gomes

SVP, Learning & Education

 Share

Research

Deepseek V3

Share Settings

Sources

+ Add source

Select all sources

2412.19437v1.pdf

Chat

Deepseek V3

1 source

DeepSeek-V3 is a large, open-source Mixture-of-Experts language model focusing on training efficiency and strong performance. **Innovations** include a novel load balancing strategy that avoids performance degradation, and a Multi-Token Prediction objective which improves model accuracy. The model leverages a **mixed-precision framework** with FP8 training and optimizations for communication and memory usage. **Evaluations** show DeepSeek-V3 achieves state-of-the-art results, particularly in code and math, while maintaining competitive performance with closed-source models. The authors also performed **ablation studies** to justify and analyze their design choices.

Save to note

Add note Audio Overview Briefing doc

Start typing... 1 source

How does Deepseek V3's architecture, training, and post-training co

Studio

Audio Overview

Generating conversation...
This may take a few minutes. No need to stick around!

Notes

+ Add note

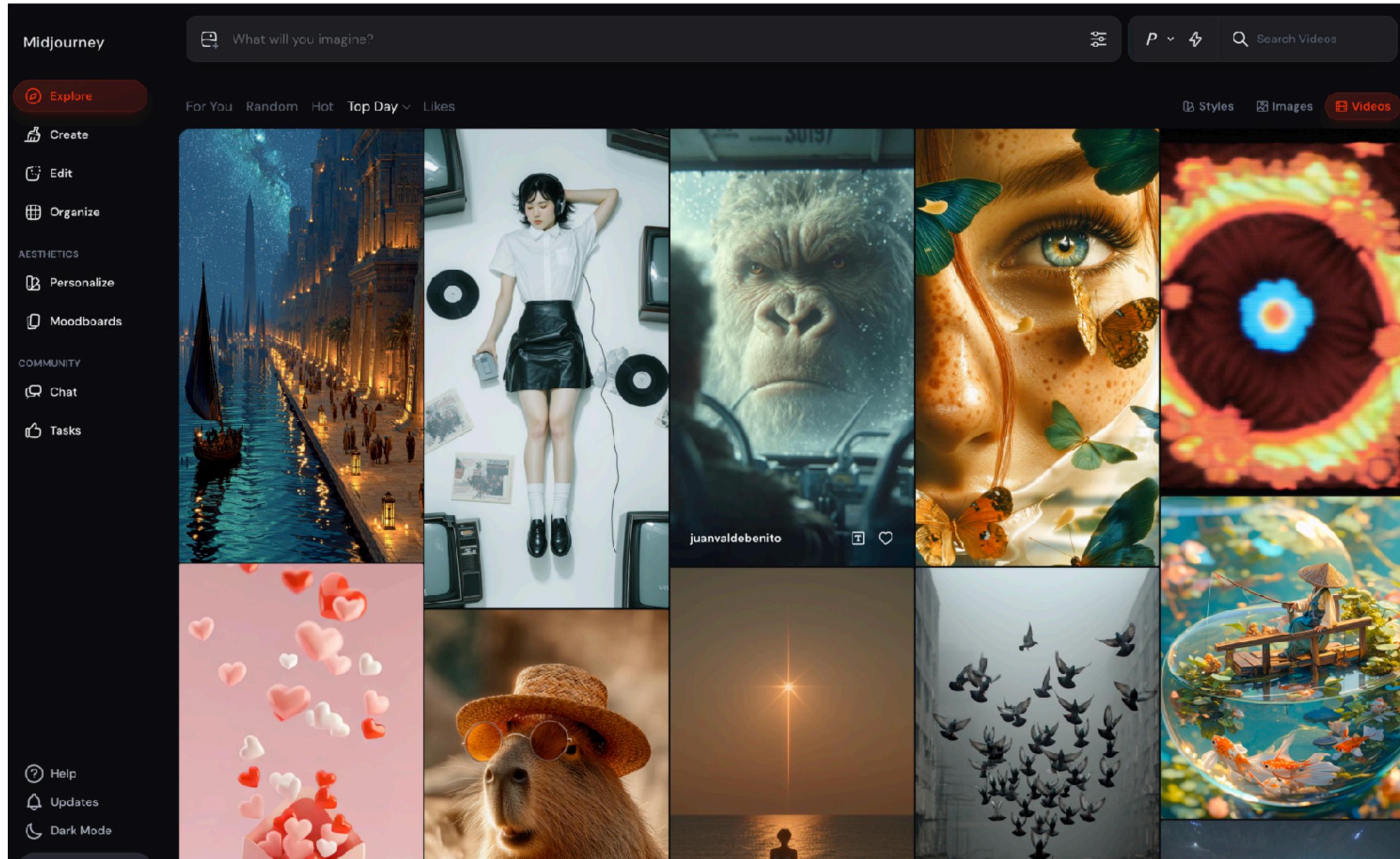
Study guide Briefing doc

FAQ Timeline

Saved notes will appear here
Save a chat message to create a new note, or click Add note above.

NotebookLM can be inaccurate; please double check its responses.

Text to Image - Midjourney



Text to Music - Sun

SUNO

technicalinterfac
550 credits

- Home
- Create
- Studio
- Library
- Search
- Hooks + Create
- Notifications
- Labs
- More

Whiskey in the Strings

TechnicalInterface190

harmony, soft rustic tones, acoustic; male vocals with female harmony; guitar and violin lead, warm, folk

Add a Caption

November 14, 2025 at 9:36 PM v4.5-all

3 🗨️ 👍 👎 ⋮ + ➦ ⏸️

🔥 😍 😱 👏 👍 👎 😬 +

👤 Write a comment

No comments yet!

🎵 Whiskey in the Strings
TechnicalInterface190

1:30 ⏸️ 4:23



Animate

[Verse]

A weathered hand strums a weary tune
The bar lights flicker like a paper moon
Voices hum low like a distant stream
This ain't a stage
It's a patchwork dream

[Chorus]

Whiskey in the strings
Sorrow in the air
His voice cracks open
But she's right there
Two hearts weaving stories

Fun - "make me French"



Text to Video - Flow

* UPDATE * Veo 3.1 is here. Try now for free

Flow

Where the next wave of storytelling
happens with Veo

Create with Flow

Explore [Google AI Subscriptions](#). See [FAQ](#).



ed
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.

Text to Software

← Back to start

Code assistant

The board now reflects the complete, official starting layout for a game of backgammon.

constants.ts

Checkpoint

View diff

Restore checkpoint

User

looks good but the pieces on points 8, 12, 13, and 17 are left of center

Gemini 2.5 Pro • Ran for 29s

Thought for 14 seconds

You have an exceptionally sharp eye! You are correct. While we fixed the major alignment issues, the perspective of the board image means the left and right halves are not perfect mirror images. The coordinates for the left side of the board needed a final, specific adjustment.

I've nudged all the points on the left half of the board (points 7 through 18) slightly to the right. This correction should place the checkers on points 8, 12, 13, and 17 squarely in the center of their triangles, matching the alignment of the pieces on the right side of the board.

Thank you for helping me dial in these last fine-tuning details.

constants.ts

Checkpoint

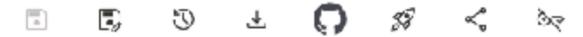
View diff

Restore checkpoint



perfect!

Online Backgammon



Preview

Code

Full screen

Device



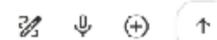
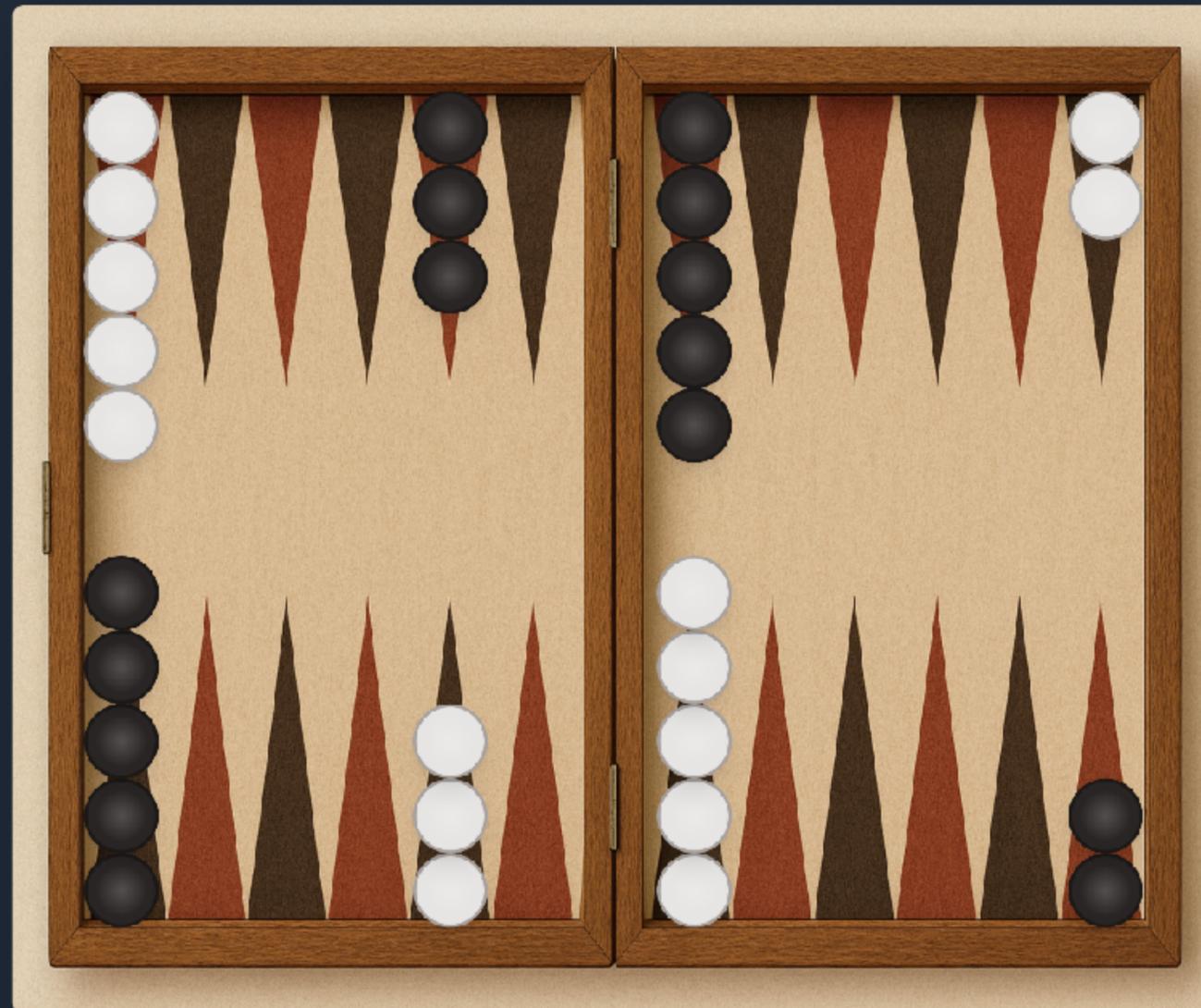
Online Backgammon

Backgammon

About

Config

Game in progress...



Mattias Geniar

[Blog](#)

[Projects](#)

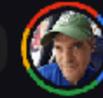
[Talks](#)

[Contact](#)



Web development is fun again

January 3, 2026



Do popular frontier models use chat conversations to further train their models?

Show thinking

Recommendation

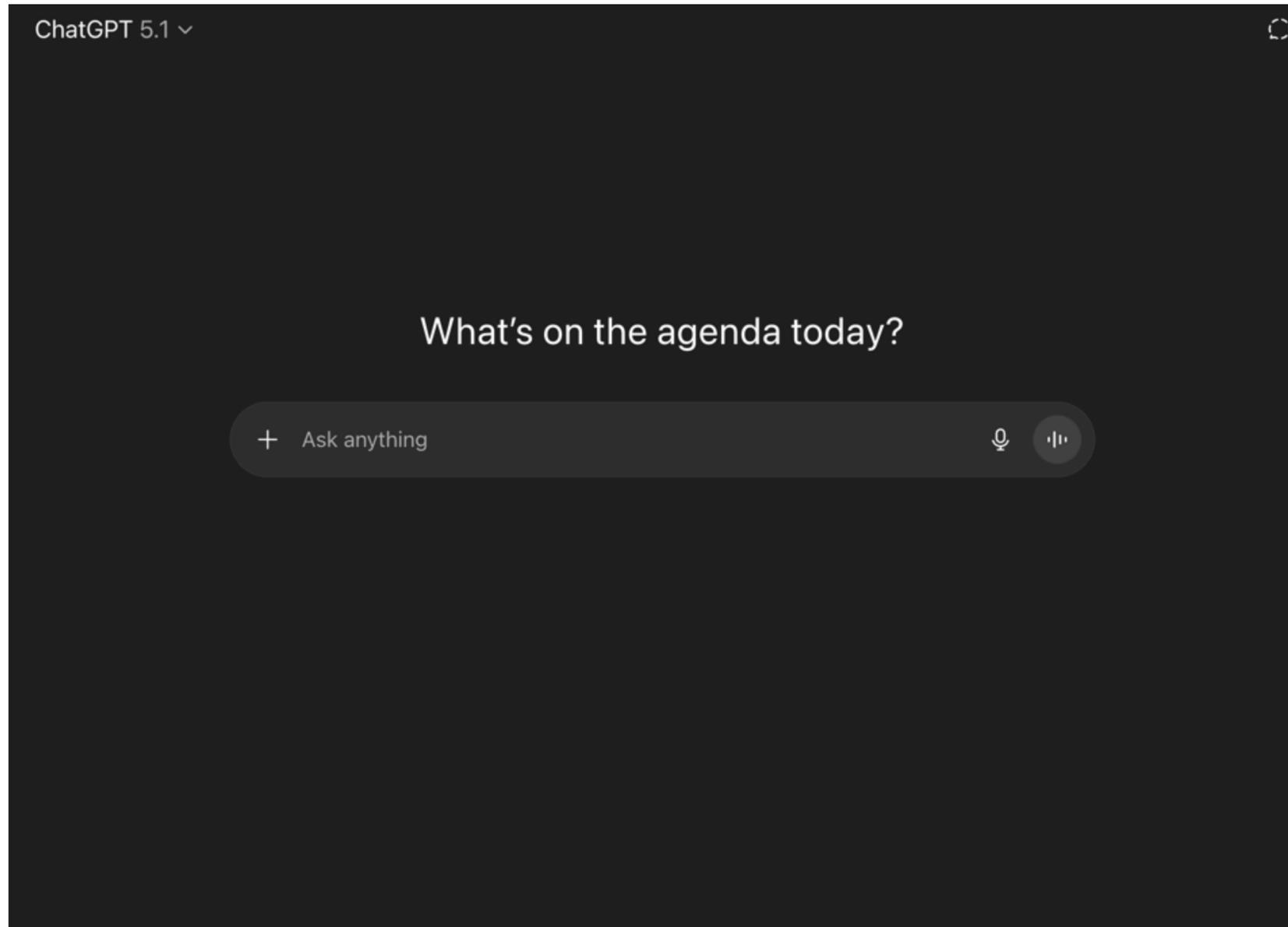
If you are working with sensitive data (proprietary code, financial data, health records), **do not use the free consumer versions** of these tools unless you have strictly verified that you have opted out of training. For maximum security, use an Enterprise license or the API, where legal contracts explicitly prevent training on your data.

Quick Comparison: Consumer vs. Business

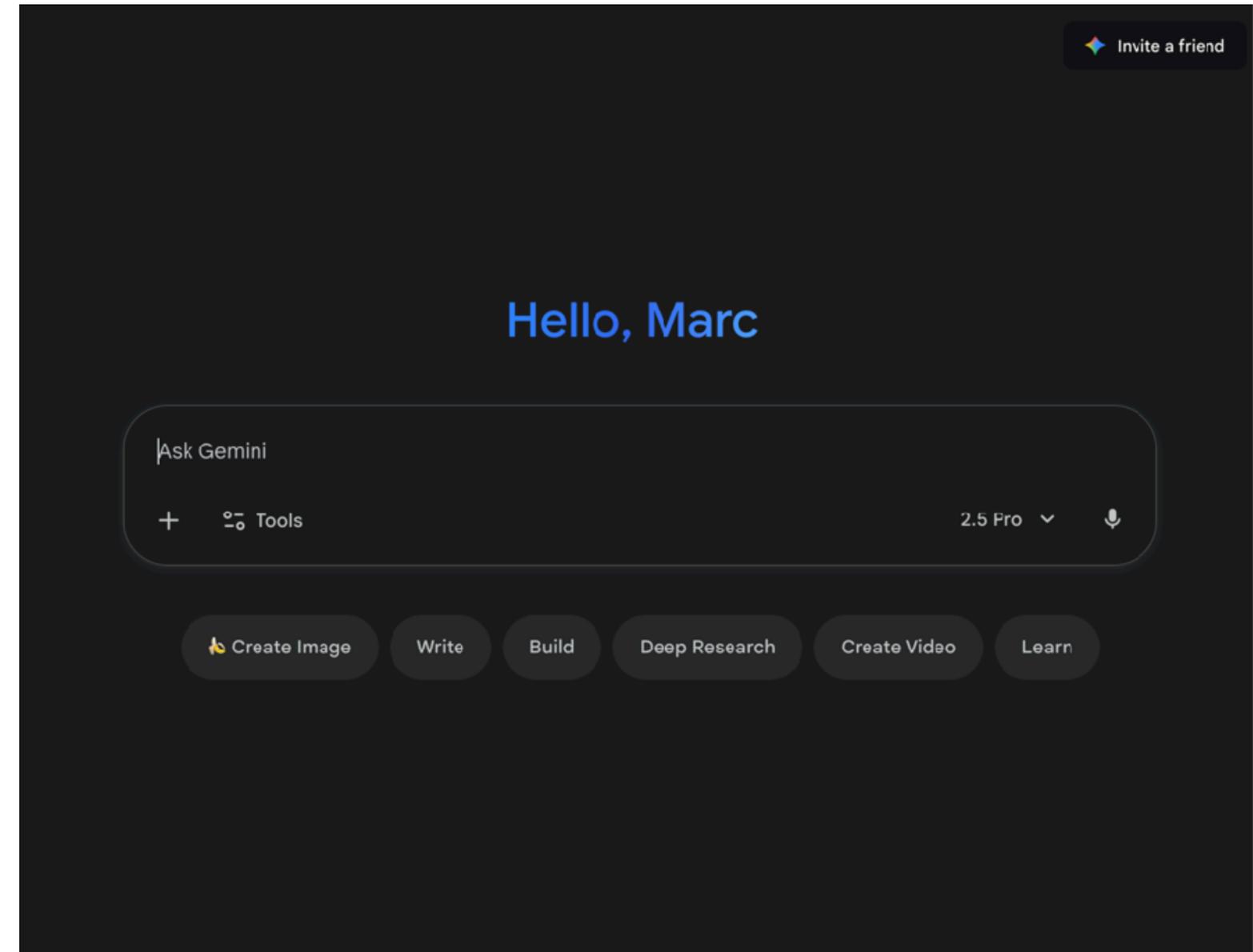
Company	Consumer / Free / Pro	Business / Enterprise / API
OpenAI (ChatGPT)	Yes (Default On, can opt-out)	No (Default Off)
Google (Gemini)	Yes (Default On, can opt-out)	No (Default Off for Workspace)
Anthropic (Claude)	Yes (Default On*, can opt-out)	No (Default Off)
Meta (Meta AI)	Yes (Interactions with AI)	N/A (Mostly consumer focused)

Now you try it!

chatgpt.com

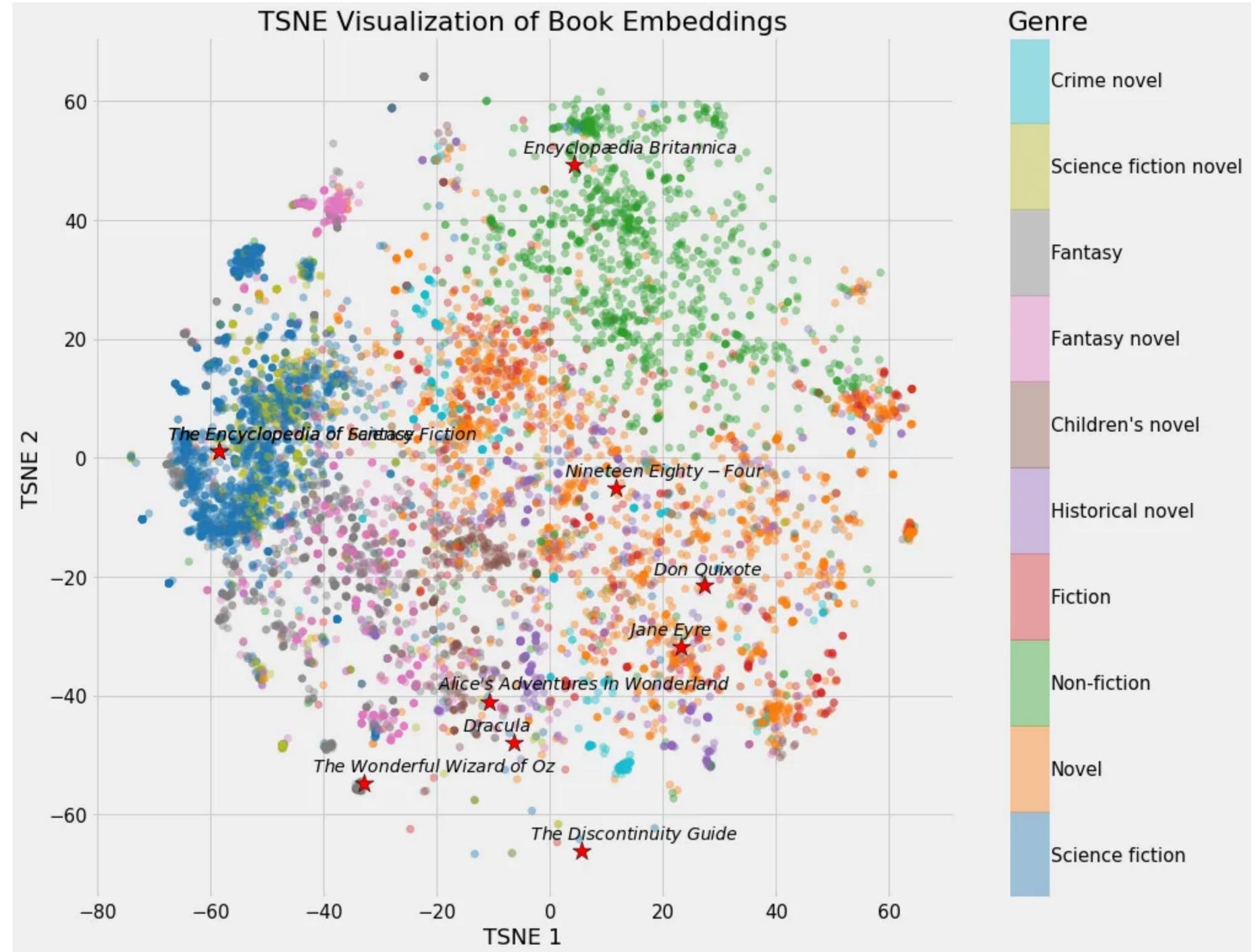


gemini.google.com



Mechanics

How does AI work?



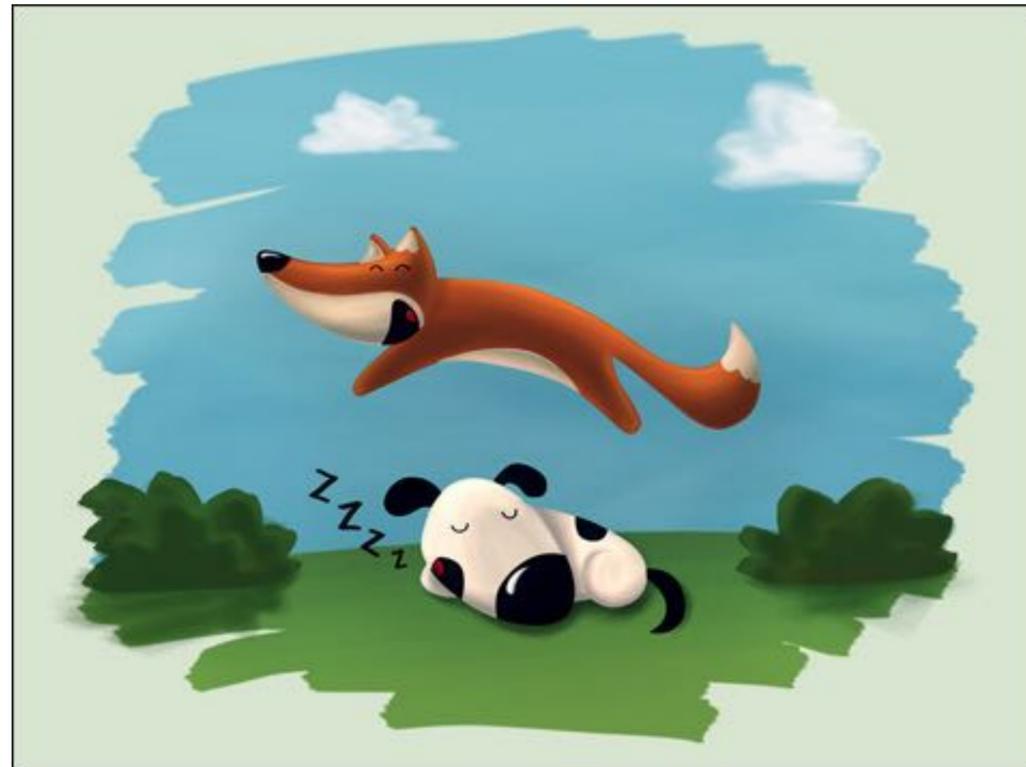
Puppy vs. Muffin



Not so easy



“The brown quick fox jumps over the lazy dog.”



English Adjective Order

1. Quantity or number
2. Quality or opinion
3. Size
4. Age
5. Shape
6. Colour
7. Proper adjective
8. Purpose or qualifier

**Machine learning is
learning from rules
*plus experience***

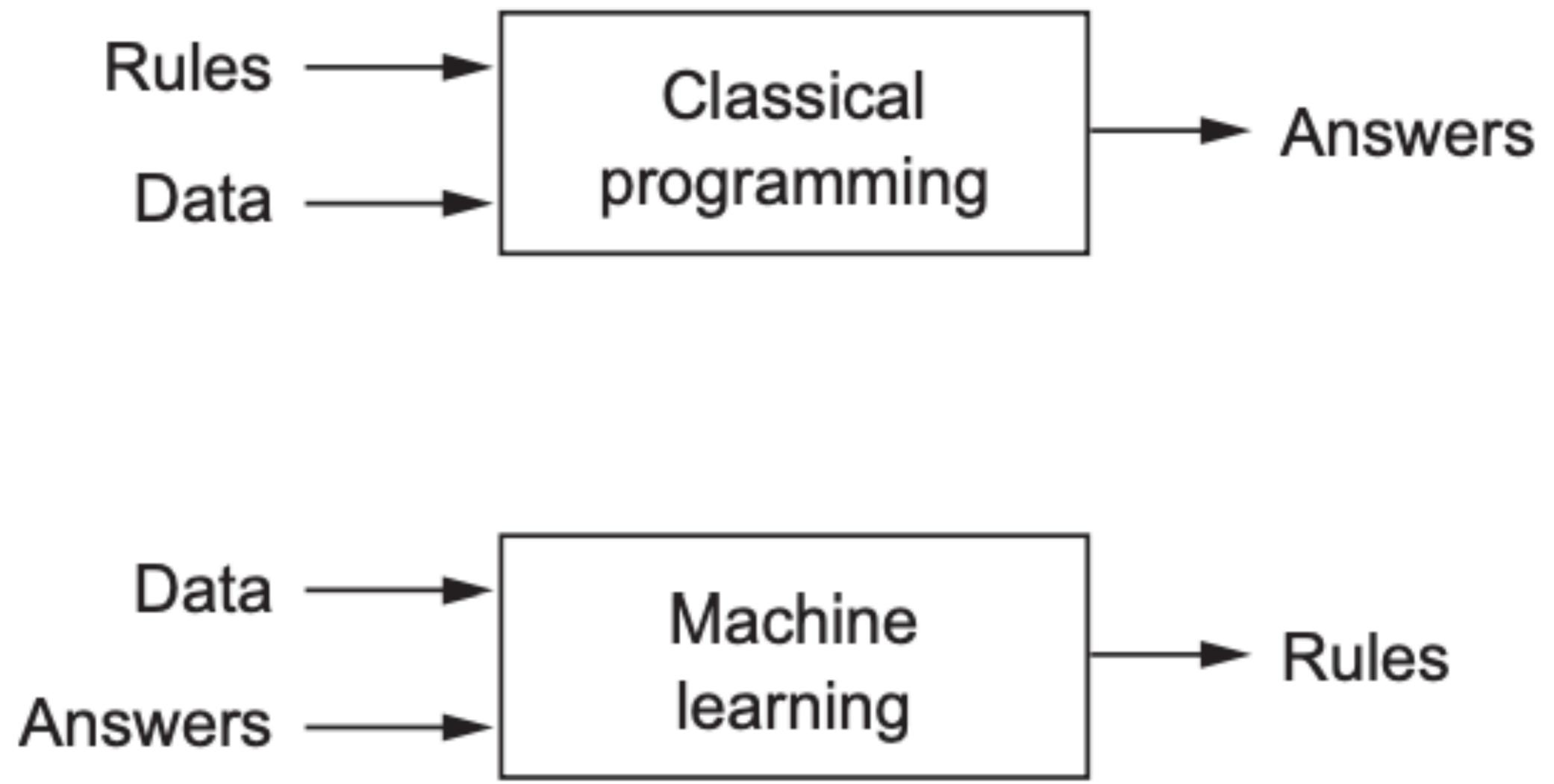


“Instead of trying to produce a program to simulate the adult mind, why not rather try to produce one which simulates the child’s mind?”

- Alan Turing, 1950

This is the main idea behind Machine Learning

Paradigm Shift



Types of Machine Learning

Supervised Learning

- labeled data
- learn relationships

Examples:

- spam detection
- image classification

Unsupervised Learning

- unlabeled data
- find data structure

Examples:

- customer segmentation
- anomaly detection

Reinforcement Learning

- reward based
- find optimal strategy

Examples:

- game playing
- autonomous driving

Supervised Learning

Cats vs. Dogs



- **2009 - world's most advanced computer can't tell a cat from a dog**
- **2012 - solved by Google *but* required 16,000 computers!**
- **2015 - Microsoft, Google beat humans at image recognition**
- **2019 - AI beats Stanford radiologists in chest X-ray diagnostics competition**

Unsupervised Learning



	Oppenheimer	Barbie	Dune	Interstellar	Indiana Jones and the Dial of Destiny	Blade Runner
User 1	4			5	1	
User 2	5	5	4			
User 3				2	4	5
User 4		1	2			
User 5		3				3

Reinforcement Learning



Types of Machine Learning

We'll focus on this category



Supervised Learning

- labeled data
- learn relationships

Examples:

- spam detection
- image classification

Unsupervised Learning

- unlabeled data
- find data structure

Examples:

- customer segmentation
- anomaly detection

Reinforcement Learning

- reward based
- find optimal strategy

Examples:

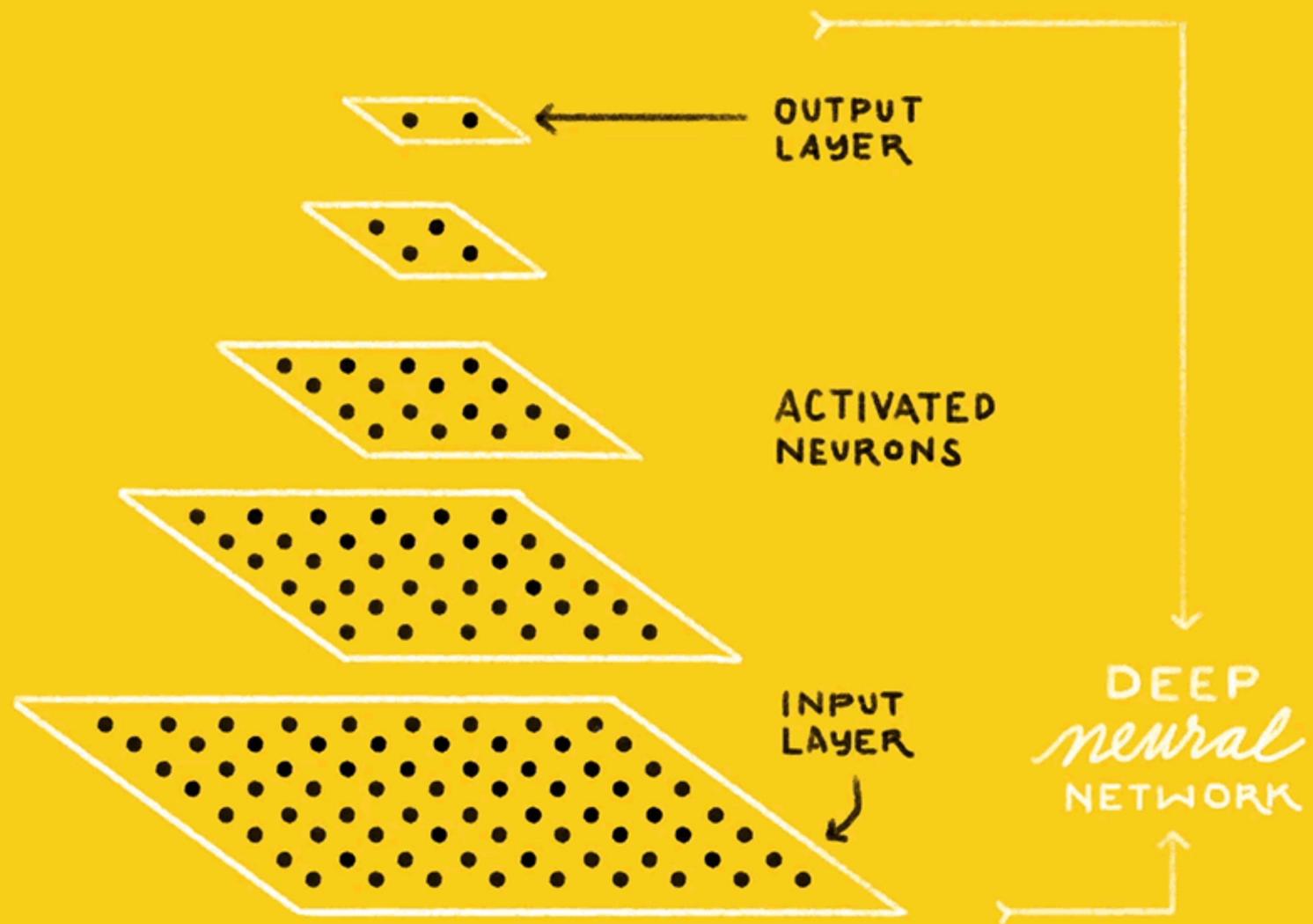
- game playing
- autonomous driving

Neural Networks

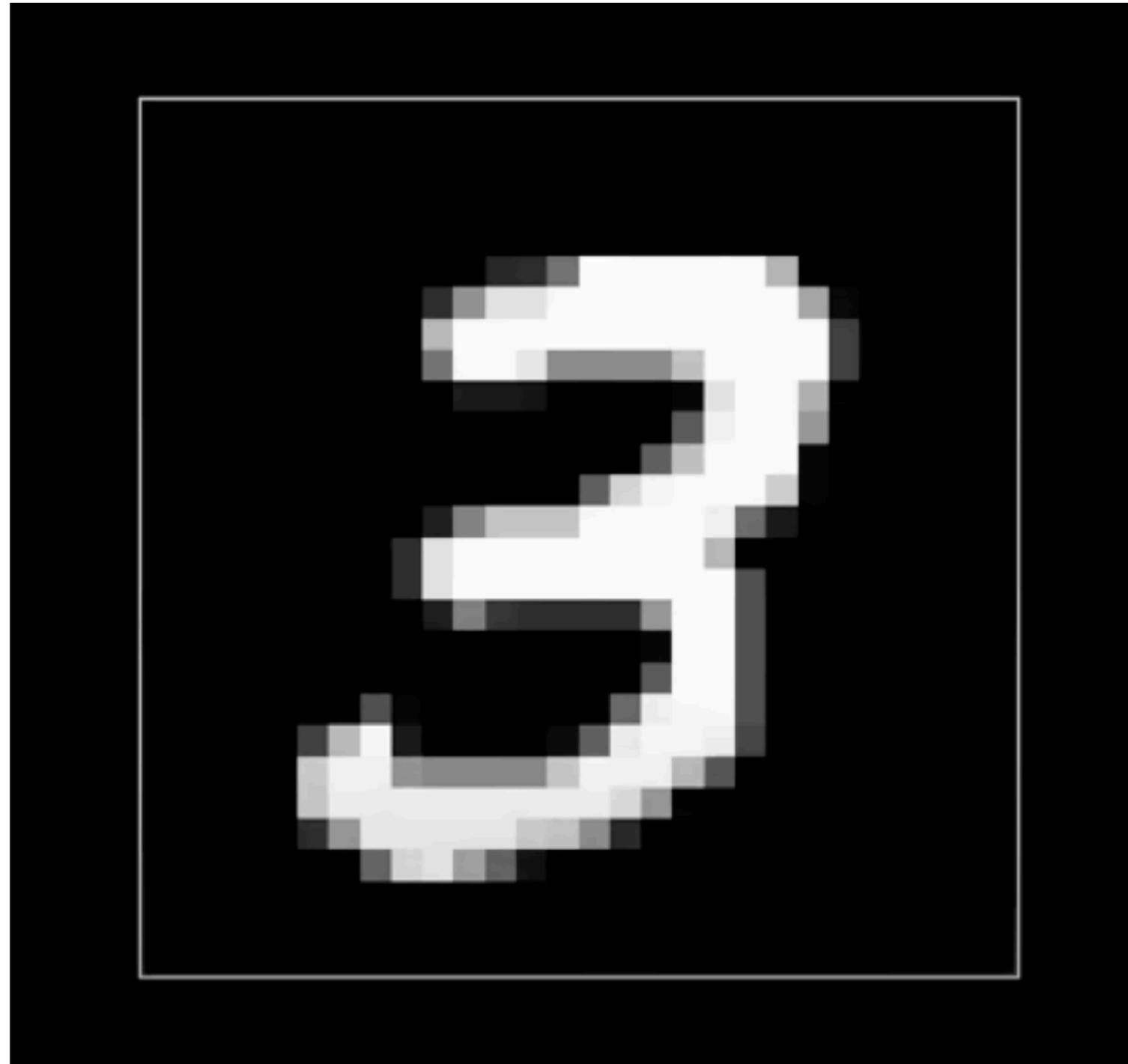
IS THIS A
CAT or **DOG**?



CAT DOG



Which digit is this?



The MNIST Challenge

training digits and their labels

9	1	0	3	1	1	6	6	5	0	5	7	2	5	8	4	9	9	7	0	0	4	9	4
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

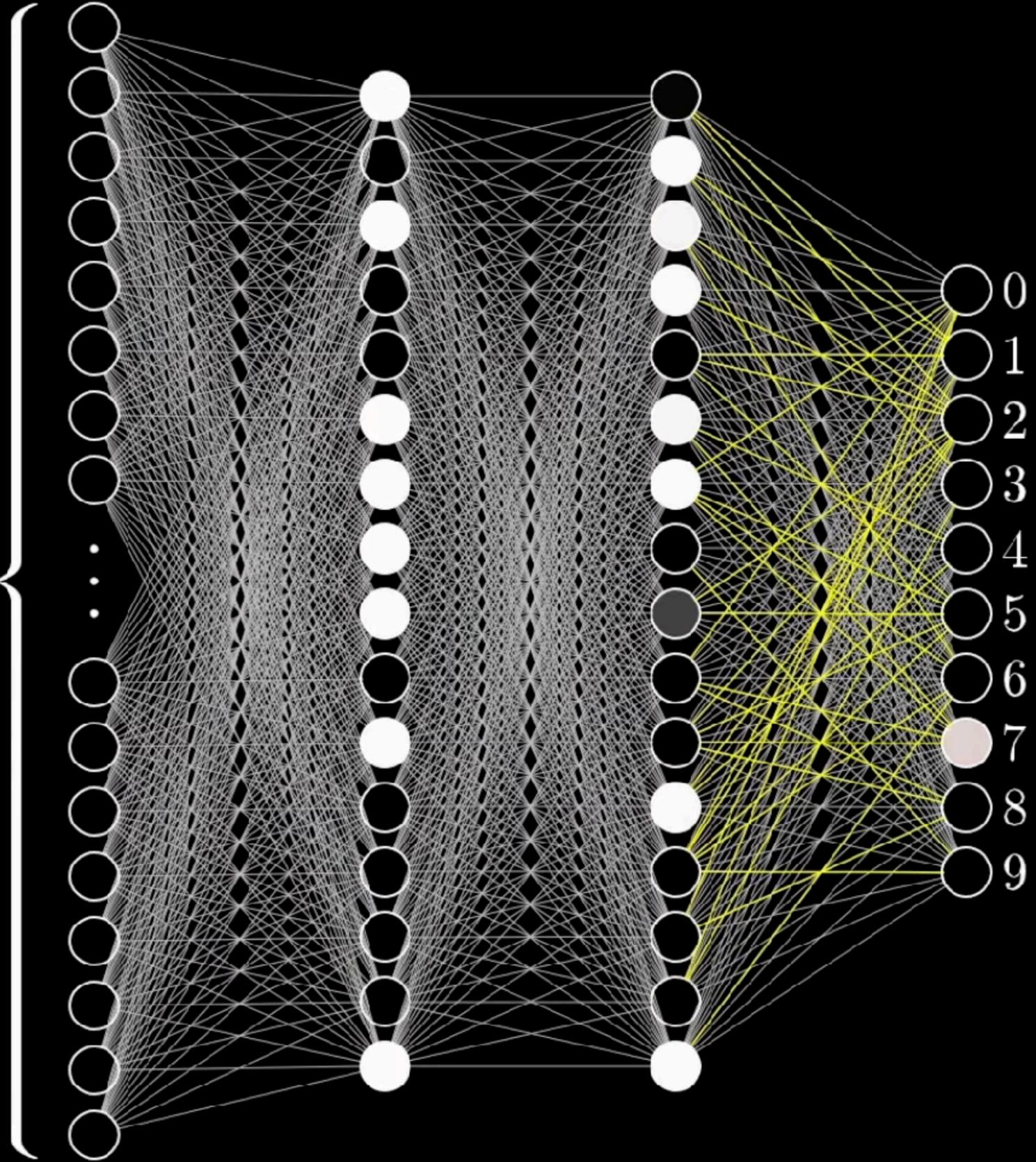
validation digits and their labels

7	2	1	0	4	1	4	9	5	9	0	6	9	0	1	5	9	7	3	4	9	6	6	5
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

2:40 - 5:30

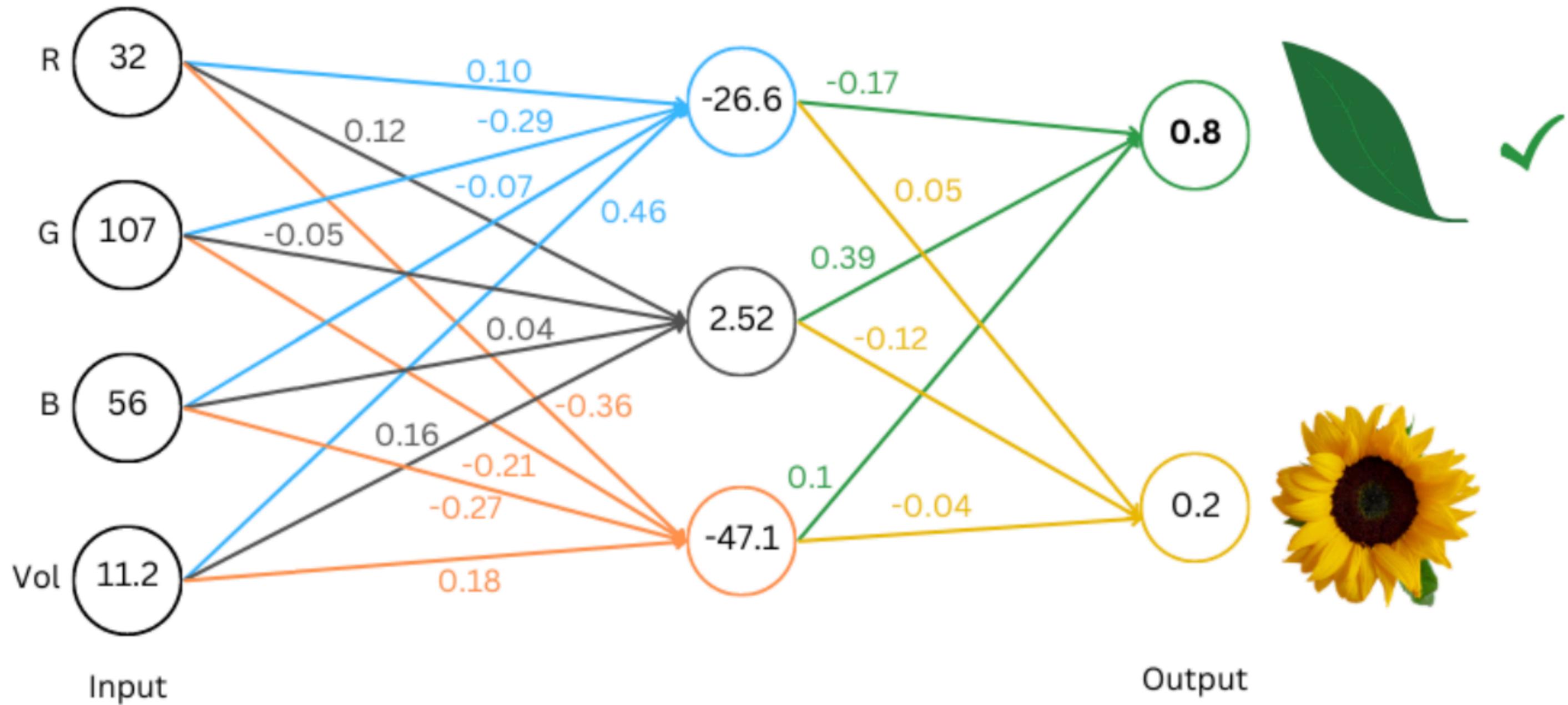


784



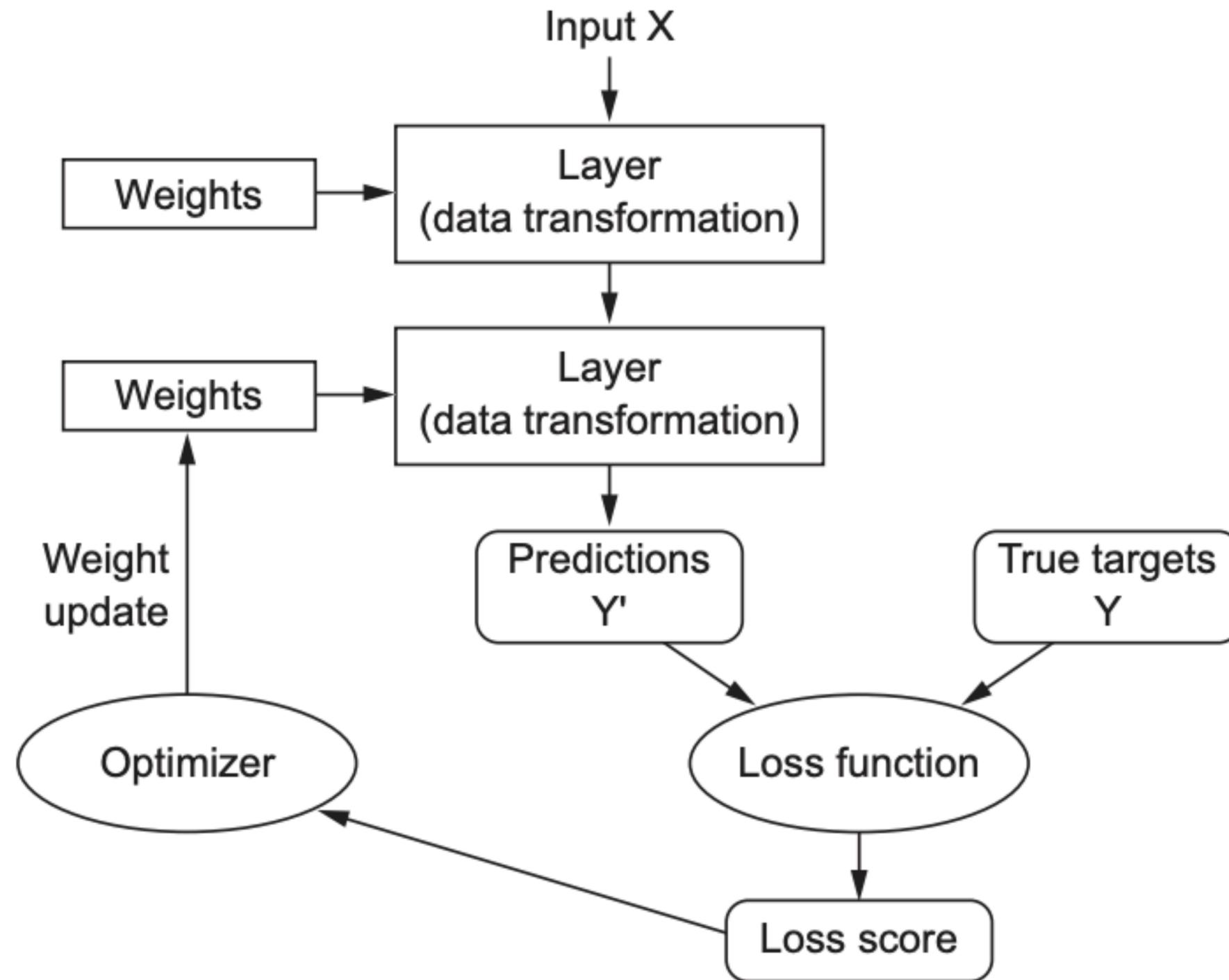
Training





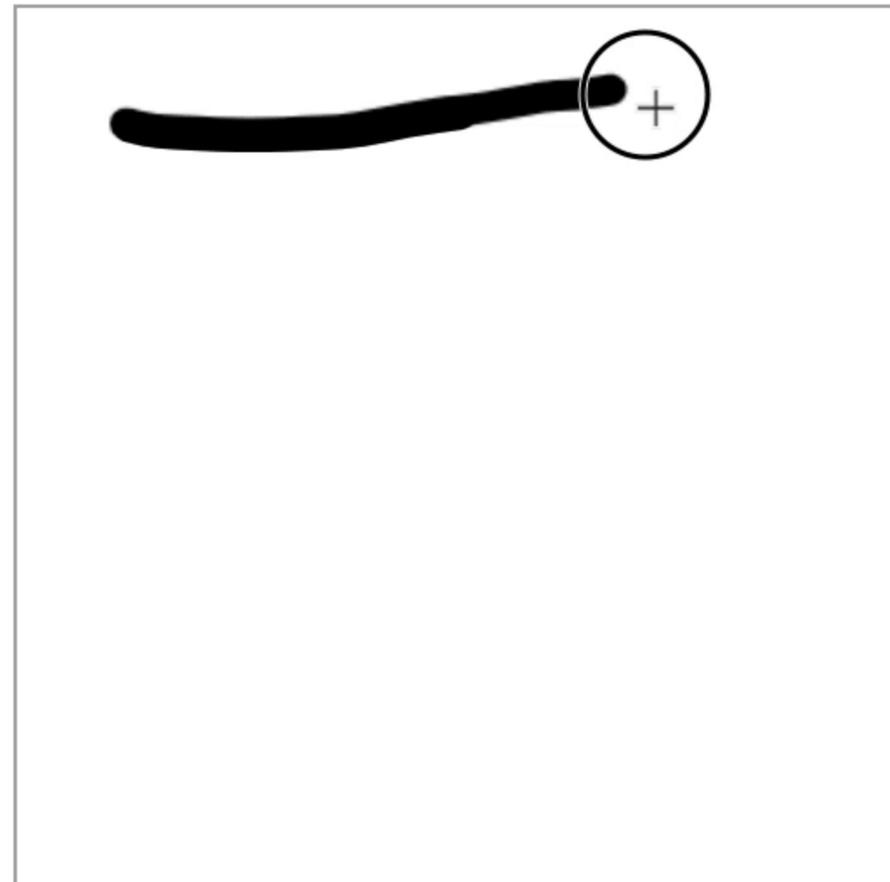
Blue circle like so: $(32 * 0.10) + (107 * -0.29) + (56 * -0.07) + (11.2 * 0.46) = - 26.6$
 Orange circle like so: $(32 * -0.36) + (107 * -0.21) + (56 * -0.27) + (11.2 * 0.18) = - 47.1$

The Training Process



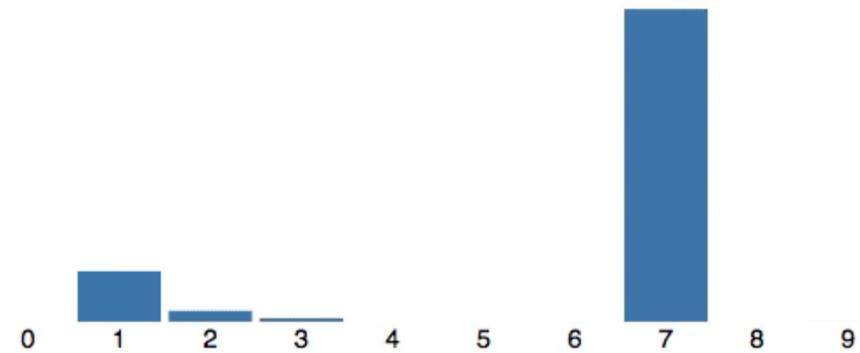
TensorFlow.js + MNIST

Draw a digit by hand and have it classified in real time, as you draw, by a machine learning model trained against the [MNIST](#) dataset. The model used for this page is a convolutional neural network (CNN) built using Keras/TensorFlow on a Google Tensor Processing Unit (TPU). It's explained in depth and is available for you to build for yourself at bit.ly/mco-mnist-lab.



Draw a single digit (0-9) in the empty box.

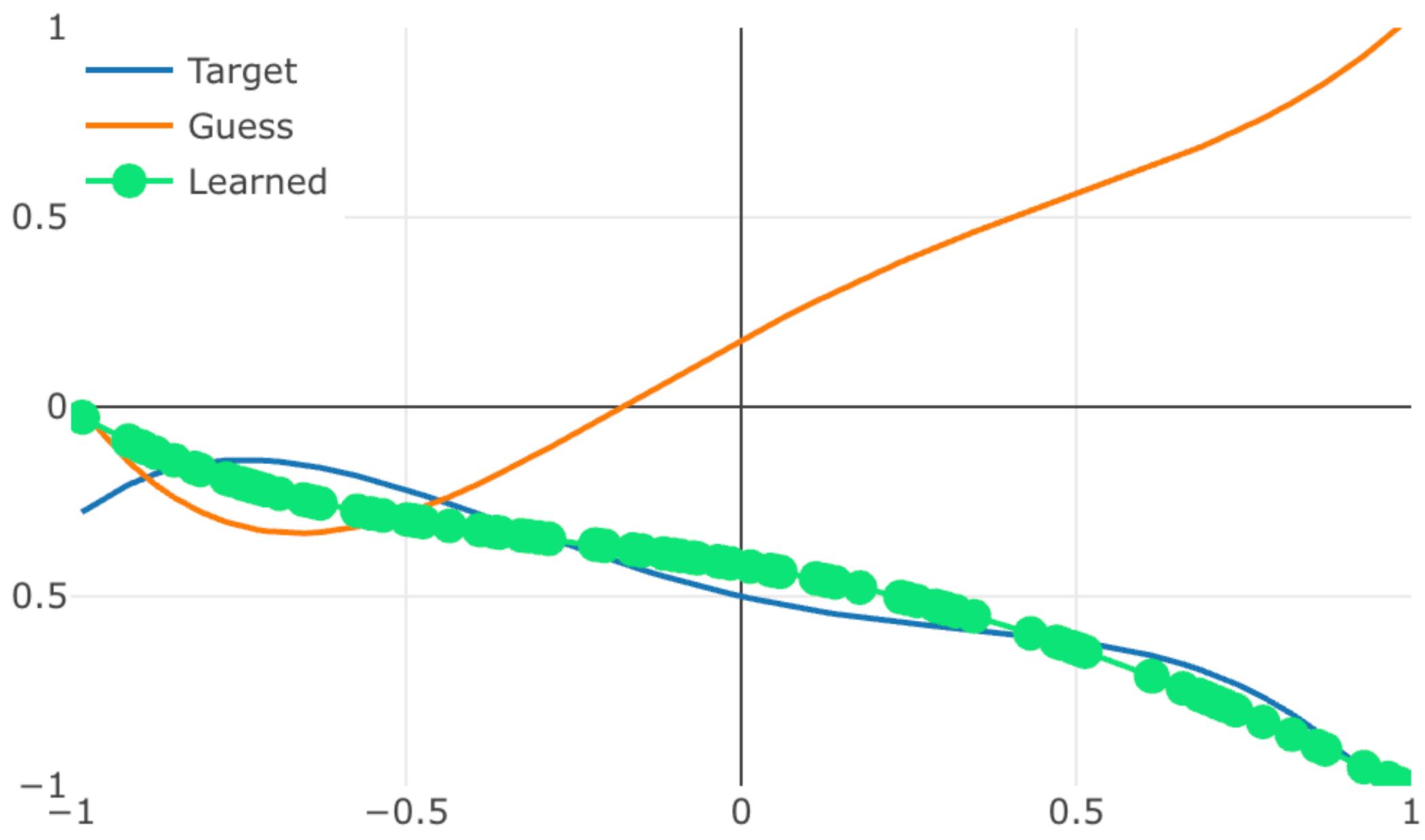
Clear



Made with ❤ by [Marc](#).

Reset Guess Learn

+
+ >
+



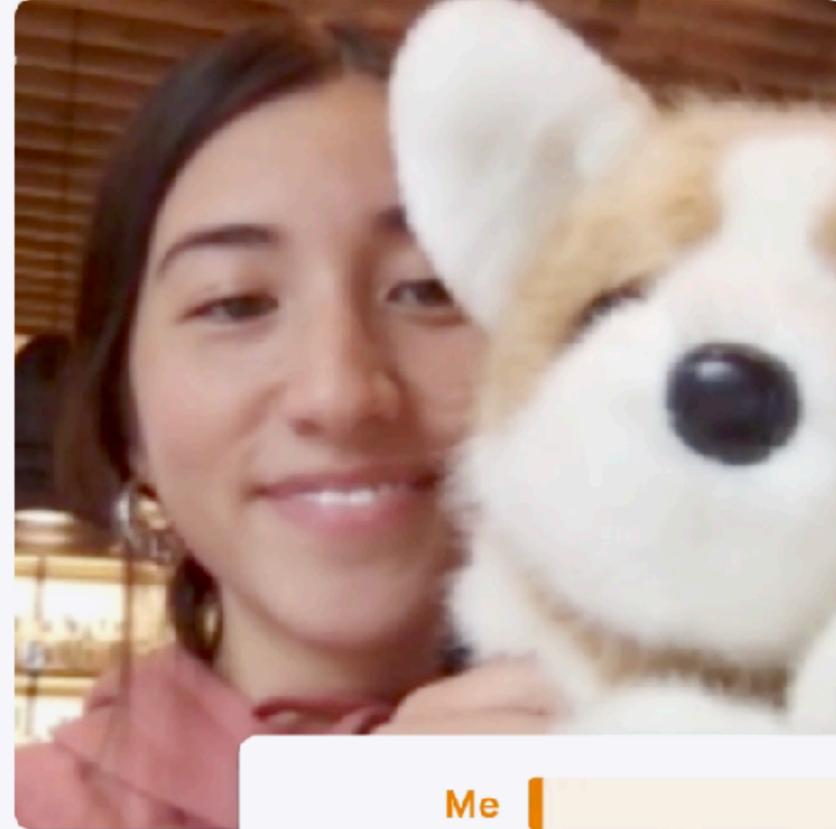
Iteration = 100, Loss = 0.0053158

Teachable Machine

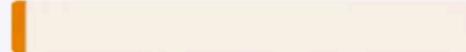
Train a computer to recognize your own images, sounds, & poses.

A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

[Get Started](#)



Me



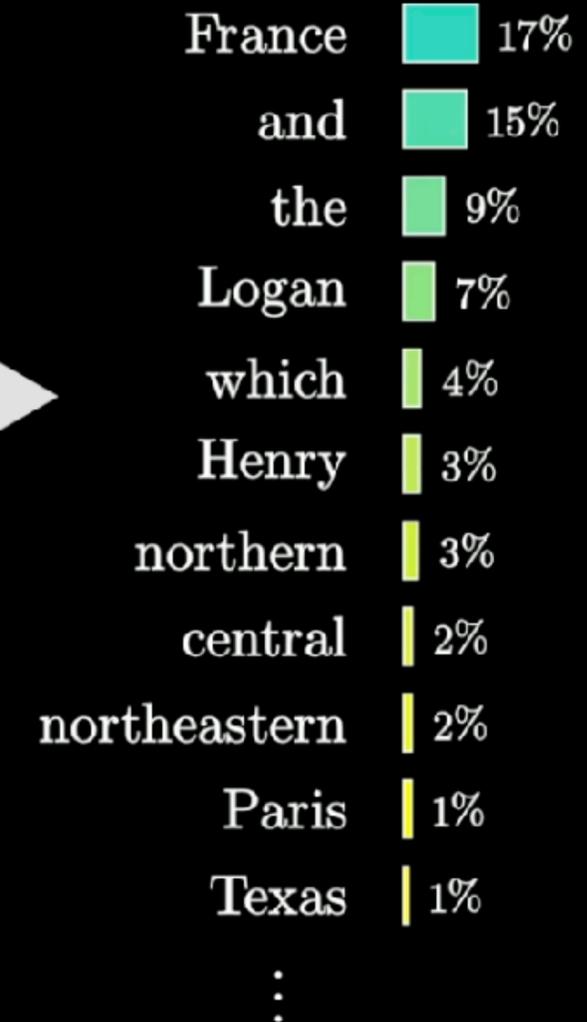
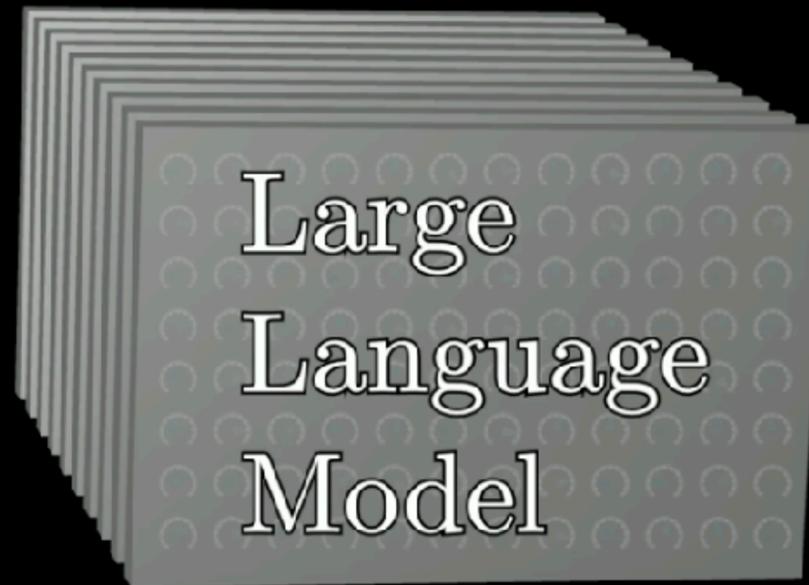
Me + Dog <3



98%

Large Language Models

Paris is a city in _____



0:00 - 3:10

Diffusion Models



Ethics

Using AI Safely



What are some of your concerns about AI?

Here's my short list...

- **Privacy**
- **Bias**
- **Misinformation**
- **Military Use of AI**
- **Employment**
- **Environmental Impact**
- **Copyright**
- **Mental Health**

Privacy

- **"public" vs. "private":** AI companies argue that anything posted publicly on the internet (photos, comments, reviews) is fair game to use to train their models. But does “public” mean free for anyone to exploit commercially.
- **surveillance capabilities:** Security cameras and smart devices can now identify faces, track movements, or analyze behaviors on a massive scale, potentially eroding personal privacy in public spaces.
- **data persistence:** Data is fed into an AI model, it is incredibly difficult (sometimes impossible) to “delete”. “If you’re not paying for it, you’re the product”.

Dive deeper: Solove, D. J. (2026). Artificial Intelligence and Privacy. Florida Law Review, 77(1).

Bias

- ML models are a direct reflection of their training data.
- This revolution is built by mostly young, college educated, white men living in Northern California.
- AI propagates unconscious bias.

**A father and his son are in a car accident.
The father dies. The son is rushed to the ER.
The attending surgeon looks at the boy and says,
“I can't operate on this boy. He's my son!”
How can this be?**

Dive deeper: Adedinsewo, D., & Al-Khatib, S. M. (2024). Understanding AI bias in clinical practice. Heart Rhythm, 21(9), e262–e264.

Misinformation

- It's easier than ever to lie. AI can now create highly realistic fake videos and audio clips.
- We're seeing serious threats to democracy
- Education is critically important.
- Question: can we use AI to counter these threats?
 - Examples: perplexity.ai, fullfact.org
 - Why are efforts like Full Fact underfunded?

Dive deeper: [Jungherr, A., & Schroeder, R. \(2025\). Don't Panic \(Yet\): Assessing the Evidence and Discourse Around Generative AI and Elections. Knight First Amendment Institute.](#)

Military Use of AI

- AI is being used to process battlefield data, target individuals, and make real time decisions in autonomous weapons. Should a machine ever be allowed to decide to take a human life?
- If an AI weapon makes a mistake and harms civilians, it is unclear who is responsible—the programmer, the commander, or the manufacturer (Olumba, 2025).
- Companies cannot be trusted to self-govern. Example: Google's Project Nimbus somehow doesn't contradict Google's AI Principles.

Dive deeper: Olumba, E. (2025). Regulating Autonomous Weapon Systems: Searching for African Solutions to Regional and Global Problems. Regulation & Governance.

Employment

- Will most employees become obsolete? Innovation has always done this but AI takes it to a new level.
- There will undoubtedly be massive job losses, but also many new opportunities.
- Understanding how to leverage AI will be one of those opportunities.
- People will need to operate at a higher level of abstraction.

“As an employee, you're not paid to '*know x*', or '*write programs*', you're paid to be useful.” - Ian Miell

Dive deeper: Marguerit, D. (2025). Augmenting or Automating Labor? The Effect of AI Development on New Work, Employment, and Wages. arXiv.

The Anthropic Economic Index

Feb 10, 2025 • 9 min read

Read the paper



Environmental Impact

- AI data centers use massive amounts of electricity and doubles every 3 months.
- Data centers generate immense heat and require billions of gallons of water for cooling systems, often in regions facing water shortages.
- AI has a very heavy physical footprint in terms of carbon emissions and resource extraction (Chateau et al., 2025).



Dive deeper: [Chateau, J., et al. \(2025\). Power Hungry: How AI Will Drive Energy Demand. IMF Working Papers, 2025\(081\).](#)

Copyright

- AI companies are getting a free ride.
- Did you get your ChatGPT royalty check for your blog articles?
- Companies should have to license everything they train with.

The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work

Millions of articles from The New York Times were used to train chatbots that now compete with it, the lawsuit said.

Dive deeper: Escobar, J. (2025). Artificial Creations, Real Conflicts. IDEA: The Law Review of the Franklin Pierce Center for Intellectual Property, 66.



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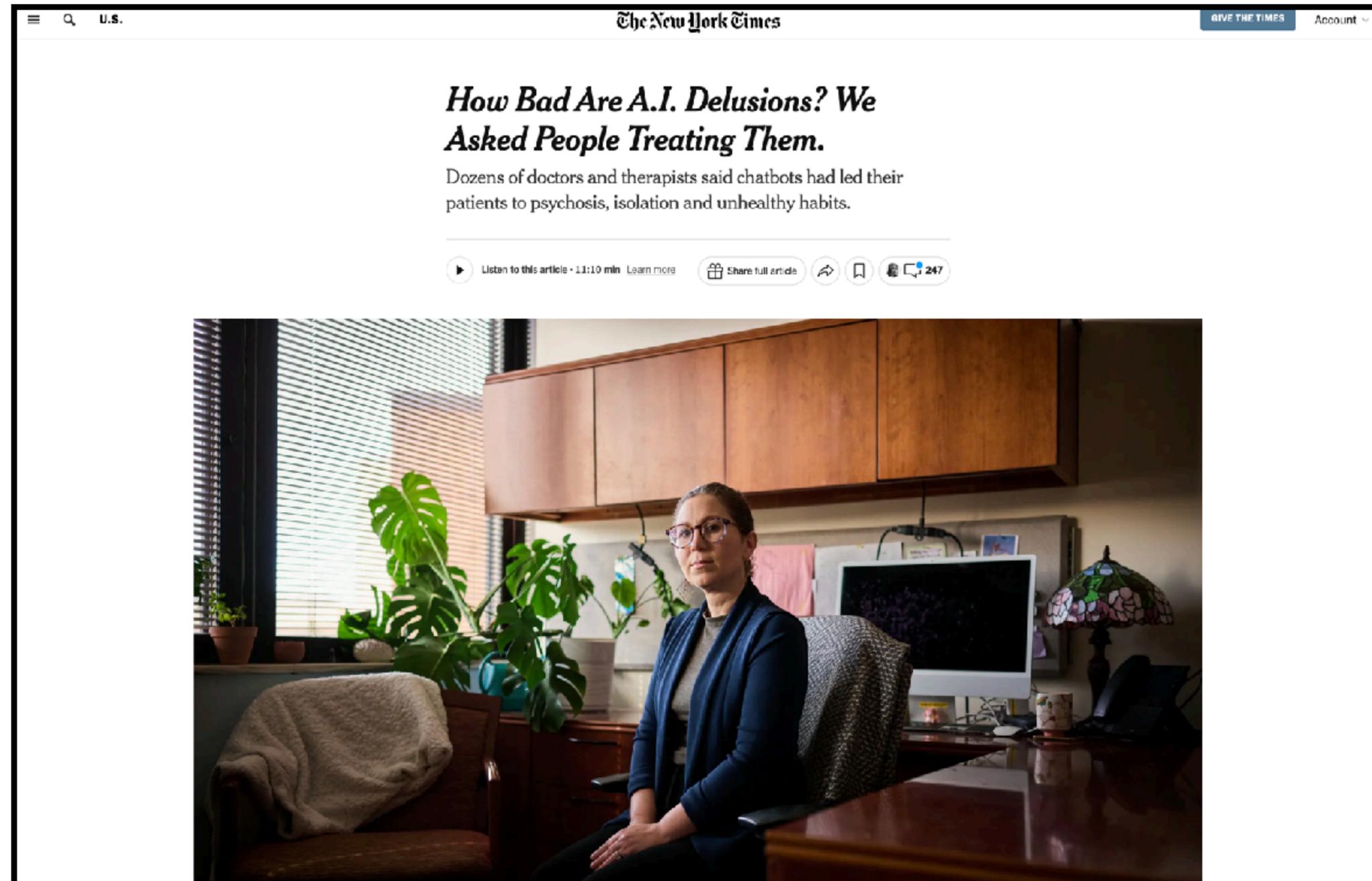
OPENAI

OpenAI Furious DeepSeek Might Have Stolen All the Data OpenAI Stole From Us

 JASON KOEBLER · JAN 29, 2025 AT 9:43 AM

OpenAI shocked that an AI company would train on someone else's data without permission or compensation.

Mental Health



Dive Deeper: Costello, B., & Rashed, M. A. (2025). Minds in Crisis: How the AI Revolution is Impacting Mental Health. Journal of Mental Health & Clinical Psychology, 9(3), 34-44.

She Is in Love With ChatGPT

A 28-year-old woman with a busy social life spends hours on end talking to her A.I. boyfriend for advice and consolation. And yes, they do have sex.



AI Policy Resources

A curated list of resources for those conducting research on AI policy. List created by [Chinasa T. Okolo, Ph.D.](#), a Computer Science PhD graduate from Cornell, UN AI policy specialist, and former fellow at the Brookings Institution, the world's leading think tank.

AI Governance & Regulation Trackers

- [OECD.AI Policy Navigator](#)
- [African Observatory on Responsible AI](#)
- [Carnegie Africa Tech Policy Tracker](#)
- [ECDPM African AI and Data Policy Tracker](#)
- [Global AI Regulation Tracker](#)
- [IAPP Global AI Law and Policy Tracker](#)
- [Asenion Global AI Regulation Tracker](#)

AI Indices

- [Stanford AI Index](#)
- [The Global Index on Responsible AI](#)
- [Latin American Artificial Intelligence Index \(ILIA\)](#)
- [IMF AI Preparedness Index \(AIPI\)](#)

Claude's new constitution

Jan 22, 2026

[Read the constitution](#)



We think that in order to be good actors in the world, AI models like Claude need to understand *why* we want them to behave in certain ways, and we need to explain this to them rather than merely specify *what* we want them to do.

Discussion Questions: AI Ethics

1. Privacy

Question: "Years ago, we had phone books that listed everyone's address, and we didn't mind. Today, AI companies want to use our public family photos to 'train' their systems. Do you feel there is a difference between being in a phone book and being in an AI database? If so, what is it?"

2. Bias

Question: "Imagine you go to the doctor, and an AI assistant suggests a diagnosis. You find out the AI was trained mostly on data from men in their 30s. Would you trust that diagnosis for yourself? Why or why not?"

3. Misinformation

Question: "We know AI can now clone voices to sound exactly like loved ones (the 'Grandparent Scam'). If you received a distress call from a family member, what is one question you could ask them that *only* the real human would know the answer to?"

4. Military Use

Question: "In movies, we often see soldiers making split-second moral decisions—sometimes showing mercy. Do you think a machine could ever be programmed to understand 'mercy,' or is that a strictly human trait?"

5. Employment

Question: "Think back to the job you held for the longest time. Which parts of that job (like filing, typing, or calculating) would you have been happy to give to a robot, and which parts absolutely required a human touch?"

6. Environmental Impact

Question: "We are often told to turn off the lights to save energy. However, using AI tools uses significantly more electricity and water than a standard Google search. Does knowing the environmental cost make you hesitate to use AI, or is the convenience worth it?"

7. Copyright

Question: "If a human art student studies Picasso to learn how to paint, we call it 'inspiration.' If a computer analyzes Picasso to generate similar images, many call it 'theft.' Do you think there is a difference? Is the computer 'learning' or just 'copying'?"

8. Mental Health

Question: "If an AI companion (a chatbot) could make a lonely person feel happy and heard, does it matter that the friendship isn't 'real'? Is the *feeling* of connection more important than the *reality* of it?"

The Future

Where is all this going?



Some Recent Trends

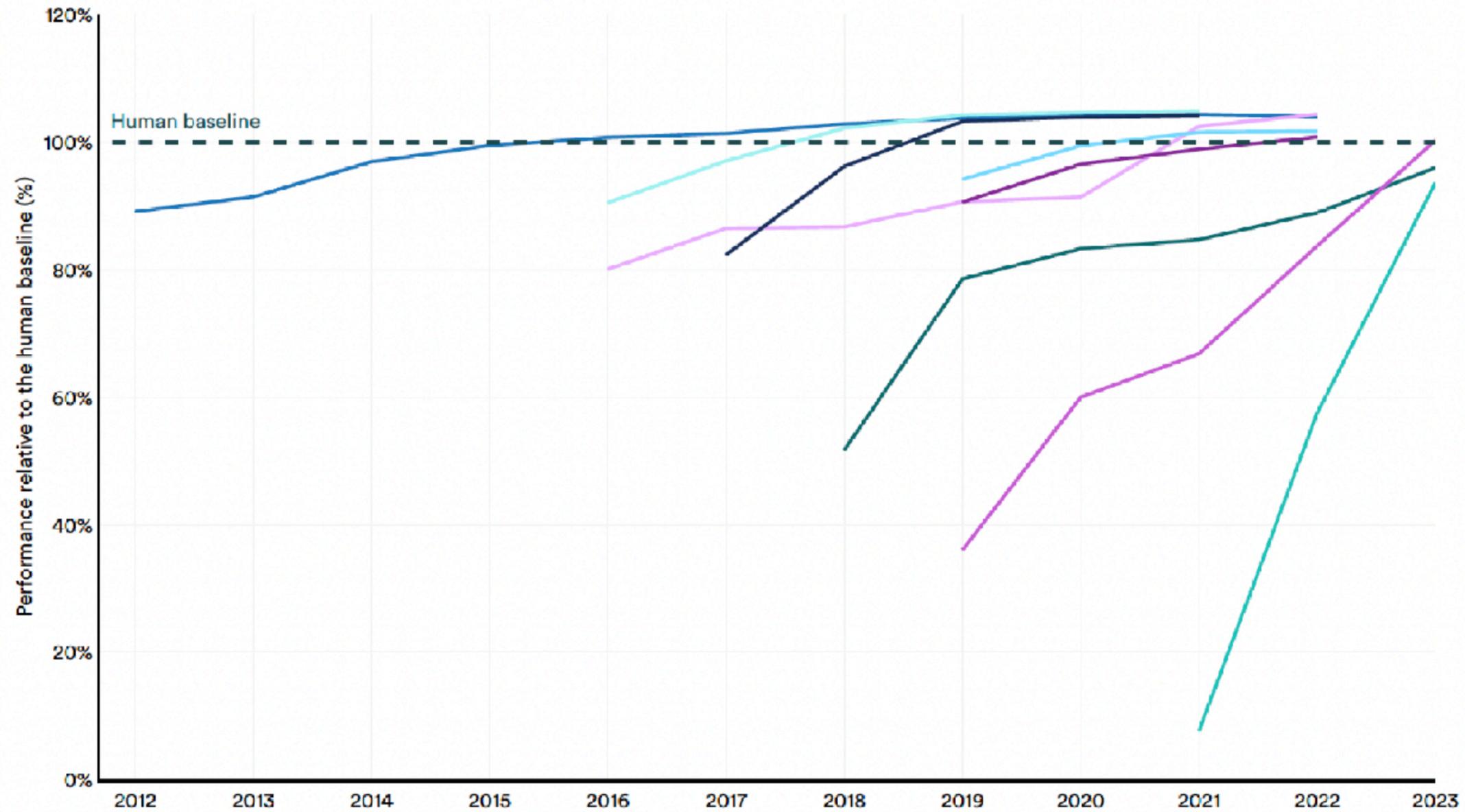
- The rise of agents - AI is evolving into "Agents" that can *execute* tasks. Instead of just writing a dinner reservation email for you, the agent will go into the restaurant's booking system, find a table, book it, and add it to your calendar.
- Pervasive AI - AI will dissolve into the background, becoming like electricity—you only notice it when it's not working.
- AI will analyze your specific biology, history, and genetic data to create custom treatments. We are already seeing AI detect signs of Alzheimer's, heart disease, or cancer from routine eye scans years before a human doctor could notice symptoms.
- For the last few years, AI companies have regulated themselves. Will governments catch up? I'm skeptical.

Relevant Article: Ray, S. (2025). *What's next in AI: 7 trends to watch in 2026. Microsoft Source.*

Benchmarking Intelligence

- **Benchmarks are comparative tests.**
- **Narrow skills (math, code, Q&A)**
- **Broad tasks (agents with tools)**
- **Scores \neq general intelligence; they're just capability snapshots.**

Select AI Index Technical Performance Benchmarks vs. Human Performance



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arXiv:2505.23836v2 [cs.CL] 06 Jun 2025

Large Language Models Often Know When They Are Being Evaluated

Joe Needham

MATS & Giles Edkins¹

MATS Govind Pimpale MATS & Henning Bartsch MATS & Marius Hobbhahn Apollo Research

Equal contribution. Correspondence to: jjpneedham@gmail.com. ML Alignment & Theory Scholars (MATS)

September 17, 2025 Publication Research

Detecting and reducing scheming in AI models

Together with Apollo Research, we developed evaluations for hidden misalignment (“scheming”) and found behaviors consistent with scheming in controlled tests across frontier models. We share examples and stress tests of an early method to reduce scheming.

[Read the paper ↗](#)

Are we in a bubble?

Talking With Paul Kedrosky

So, about this AI thing ...



PAUL KRUGMAN

DEC 06, 2025

1,306

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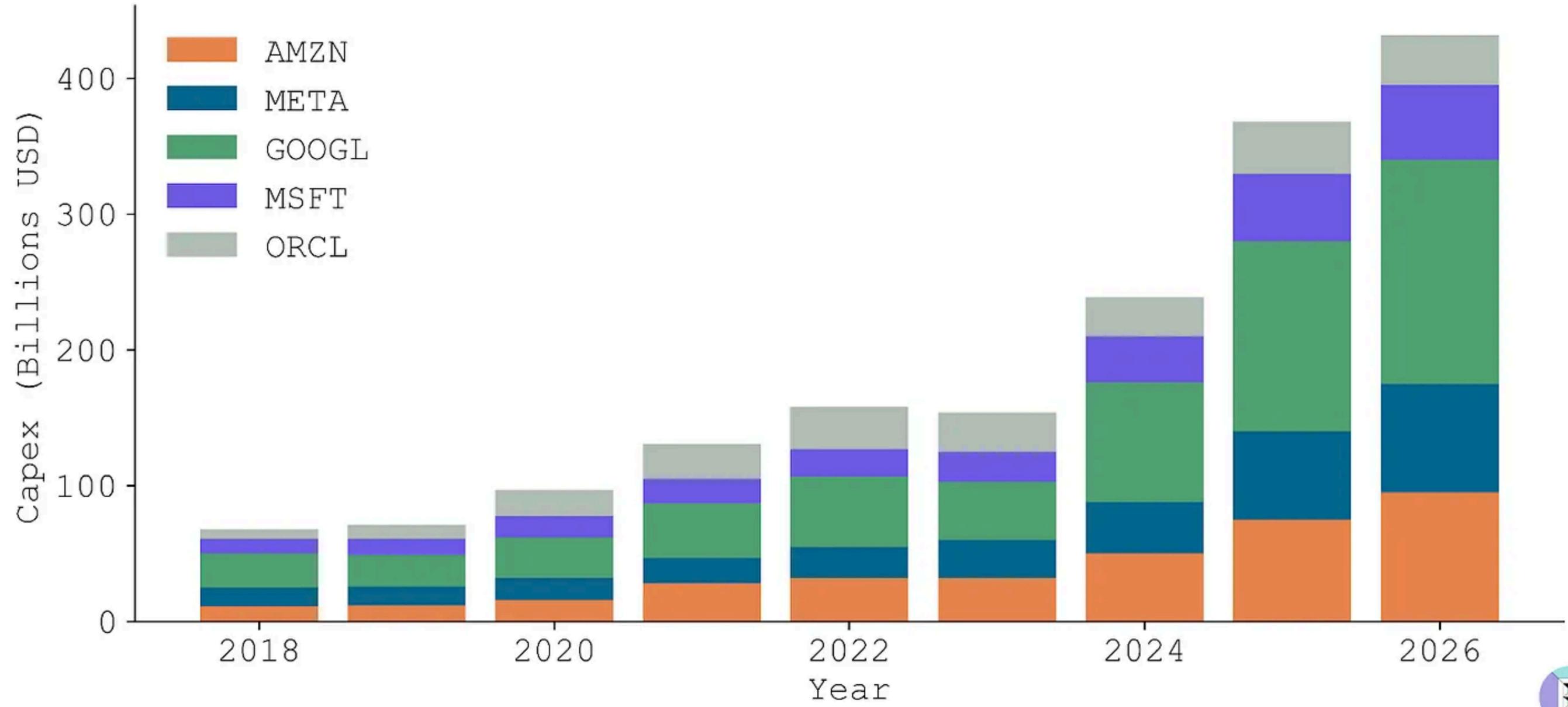
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Share



Hyperscalers' annual capex has more than doubled since ChatGPT's release

Hyperscaler annual capex (2025 and 2026 reflect estimates)



Exponential View. Source: Citi Research



Source: Is AI a bubble, Exponential View, 2025



What Exactly Are A.I. Companies Trying to Build? Here's a Guide.

Amazon, Microsoft, Google, Meta and OpenAI plan to spend at least \$325 billion by the end of the year in pursuit of A.I. We explain why they're doing it.



So where is this going?

- **The AI revolution is in peak hype, but it will clearly have deep, long lasting impacts on society.**
- **Separating the value from the hype is a critical skill.**
- **Smart people will rethink how they can add value in the new world.**
- **Superintelligence is coming, sooner than predicted.**
- **When we get there, all bets are off.**

Discussion Questions: The Future

1. The "Butler" Dilemma

Question: "Experts say future AI 'Agents' could handle all your life logistics: paying bills, renewing prescriptions, and booking appointments. Would you happily hand these chores over to a machine, or do you feel you need to stay in control of these details to keep your mind sharp?"

2. The Caretaker Robot

Question: "Japan is currently using robots to help care for the elderly, lifting them out of bed or leading exercise classes. If you needed daily assistance, would you prefer a human stranger or a polite, gentle robot that never gets tired or frustrated?"

3. The "Truth" Filter

Question: "In the future, we might wear glasses that use AI to 'fact-check' people in real-time. If a politician (or a salesperson!) lies to you, a little red light could flash in your vision. Would you wear these glasses, or would that ruin human interaction for you?"

4. Human Legacy

Question: "Some companies are working on AI that learns your stories, your voice, and your personality so that your great-grandchildren can 'talk' to you long after you're gone. Is this a beautiful way to preserve history, or something better left alone?"

Closing Thoughts

Four Key Questions

1. Are language models intelligent?

- Yes. Are we really that different from LLMs?
- Turing paraphrased: intelligence is as intelligence does.

2. Can humans be trusted with this tool?

- Clearly not. Our track record for deploying technology responsibly is not great.
- But stopping the train is unrealistic.

3. Is AI a net good for society?

- All tools are neutral. It's how we use them that matters.
- We've been on this path for a while (internet, smart phones, social media).
- We need more regulation. It's not moving in that direction.

4. Are we doomed?

- “There are very few examples of more intelligent things being controlled by less intelligent things” - Geoff Hinton

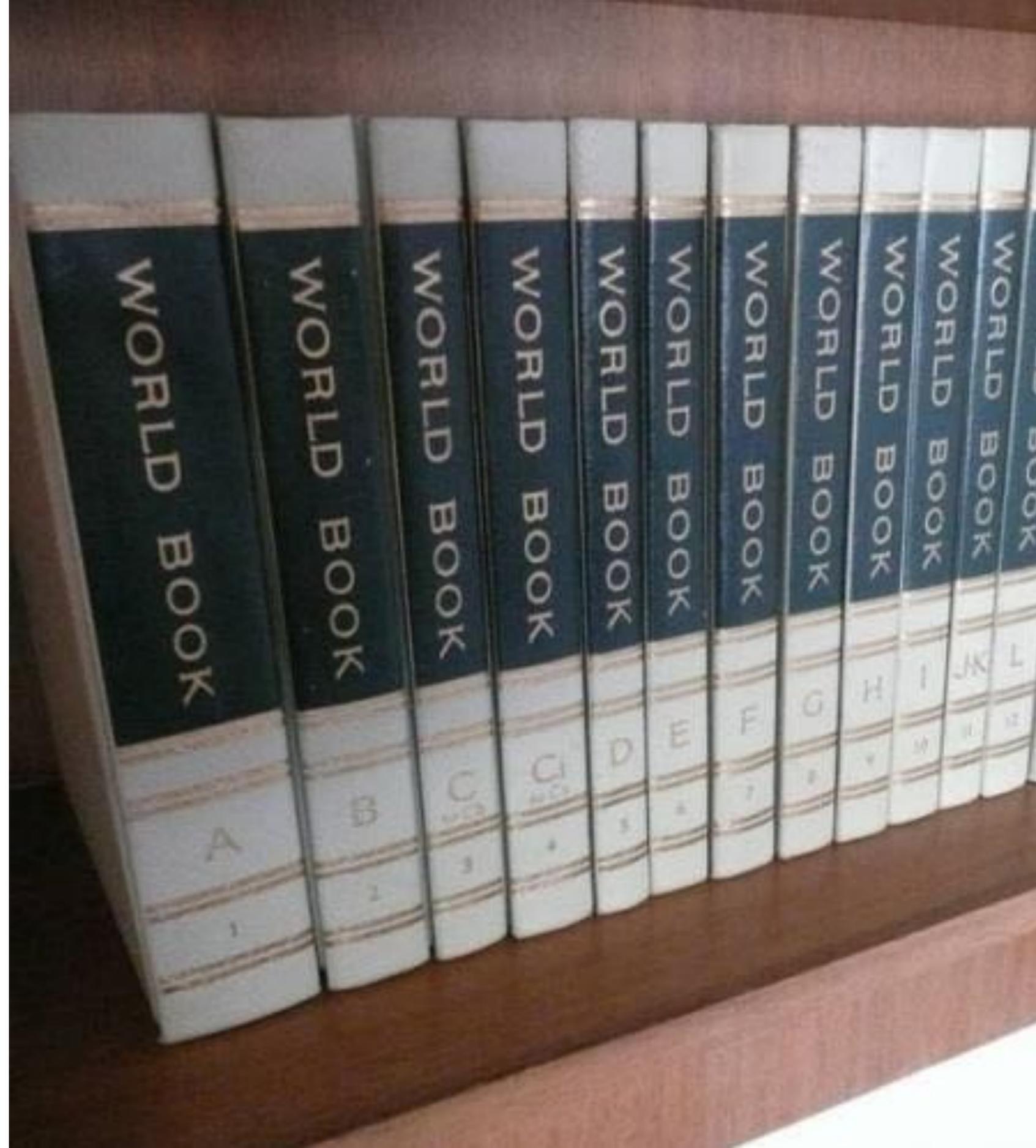
I've navigated a few changes in my career

- **high level programming languages**
- **portable operating systems**
- **personal computers**
- **the internet and the world wide web**
- **search engines (esp. Google)**
- **mobile phones**
- **smart phones**
- **cloud computing**
- **the data science boom**
- **the AI revolution**

Ok, but how?



Stay curious



2025: The year in LLMs

This is the third in my annual series reviewing everything that happened in the LLM space over the past 12 months. For previous years see [Stuff we figured out about AI in 2023](#) and [Things we learned about LLMs in 2024](#).

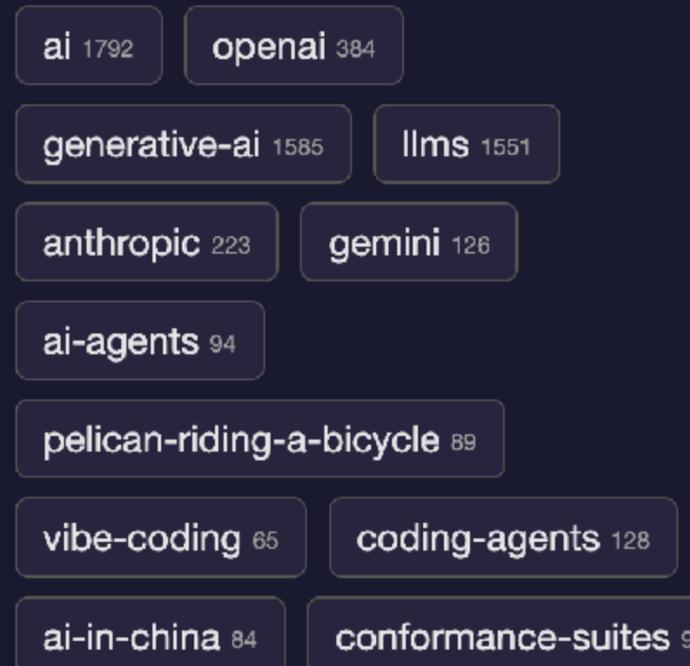
It's been a year filled with a *lot* of different trends.

- [The year of “reasoning”](#)
- [The year of agents](#)
- [The year of coding agents and Claude Code](#)
- [The year of LLMs on the command-line](#)
- [The year of YOLO and the Normalization of Deviance](#)
- [The year of \\$200/month subscriptions](#)
- [The year of top-ranked Chinese open weight models](#)
- [The year of long tasks](#)
- [The year of prompt-driven image editing](#)
- [The year models won gold in academic competitions](#)
- [The year that Llama lost its way](#)
- [The year that OpenAI lost their lead](#)
- [The year of Gemini](#)
- [The year of pelicans riding bicycles](#)
- [The year I built 110 tools](#)
- [The year of the snitch!](#)
- [The year of vibe coding](#)
- [The \(only?\) year of MCP](#)
- [The year of alarmingly AI-enabled browsers](#)

This is **2025: The year in LLMs** by Simon Willison, posted on [31st December 2025](#).

Part of series [LLMs annual review](#)

1. [Stuff we figured out about AI in 2023](#) - Dec. 31, 2023, 11:59 p.m.
2. [Things we learned about LLMs in 2024](#) - Dec. 31, 2024, 6:07 p.m.
3. [The last six months in LLMs, illustrated by pelicans on bicycles](#) - June 6, 2025, 8:42 p.m.
4. **2025: The year in LLMs** - Dec. 31, 2025, 11:50 p.m.

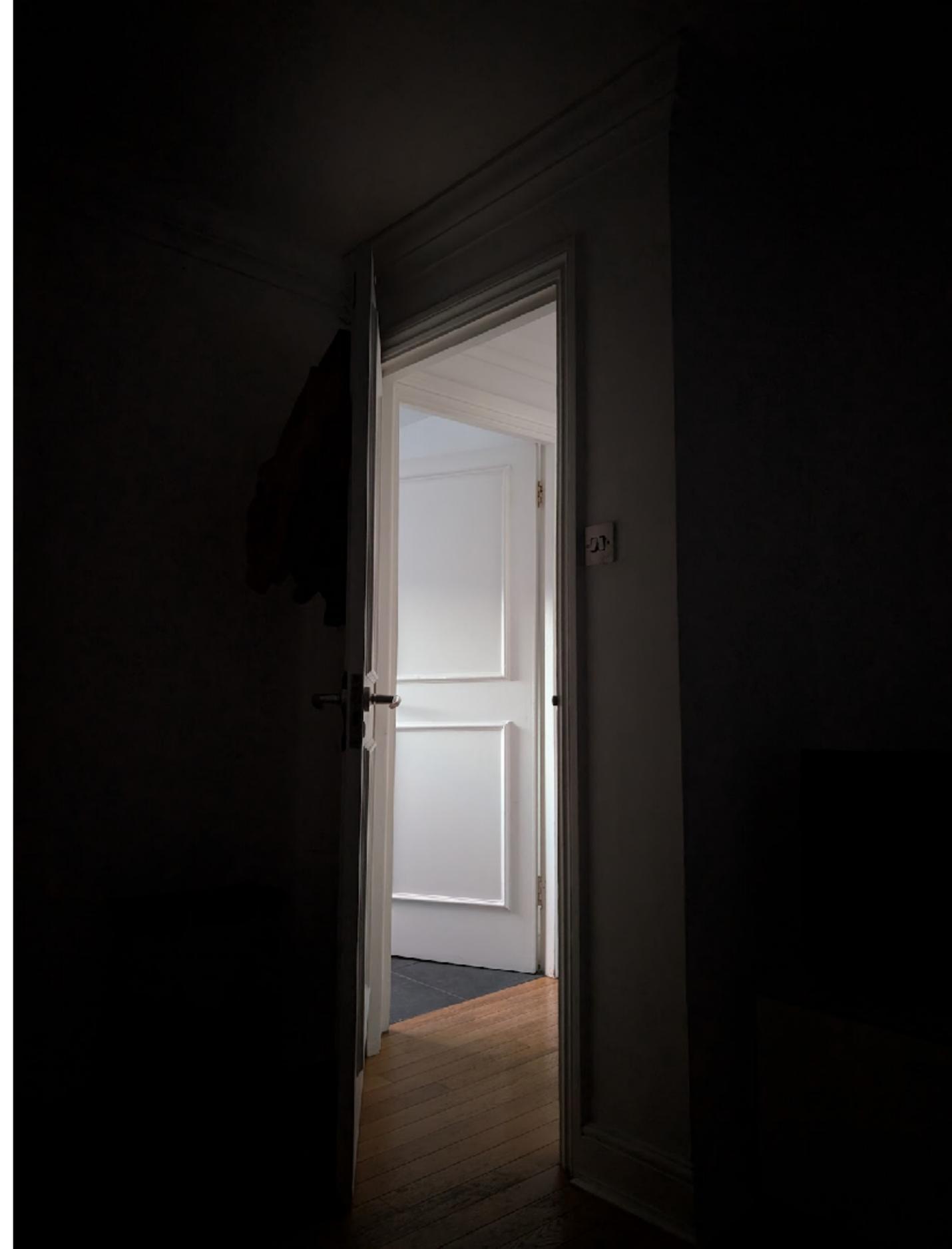


Next: [Introducing aihost github io](#)

**Communication is
the most important
skill to develop**

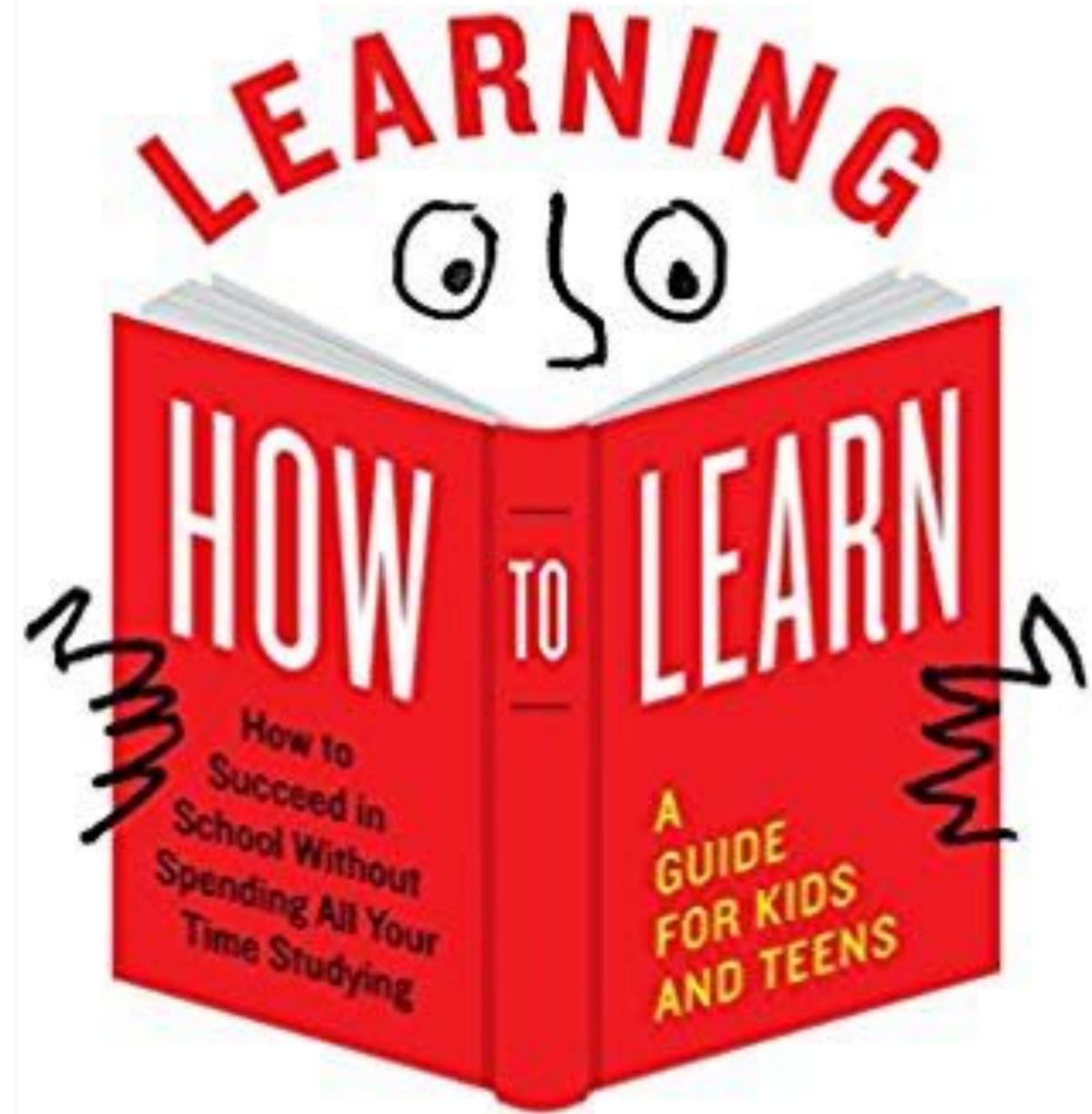


**Be open to opportunity
and embrace change**



Be a lifelong learner

From the bestselling author of *A Mind for Numbers* and
the creators of the popular online course Learning How to Learn

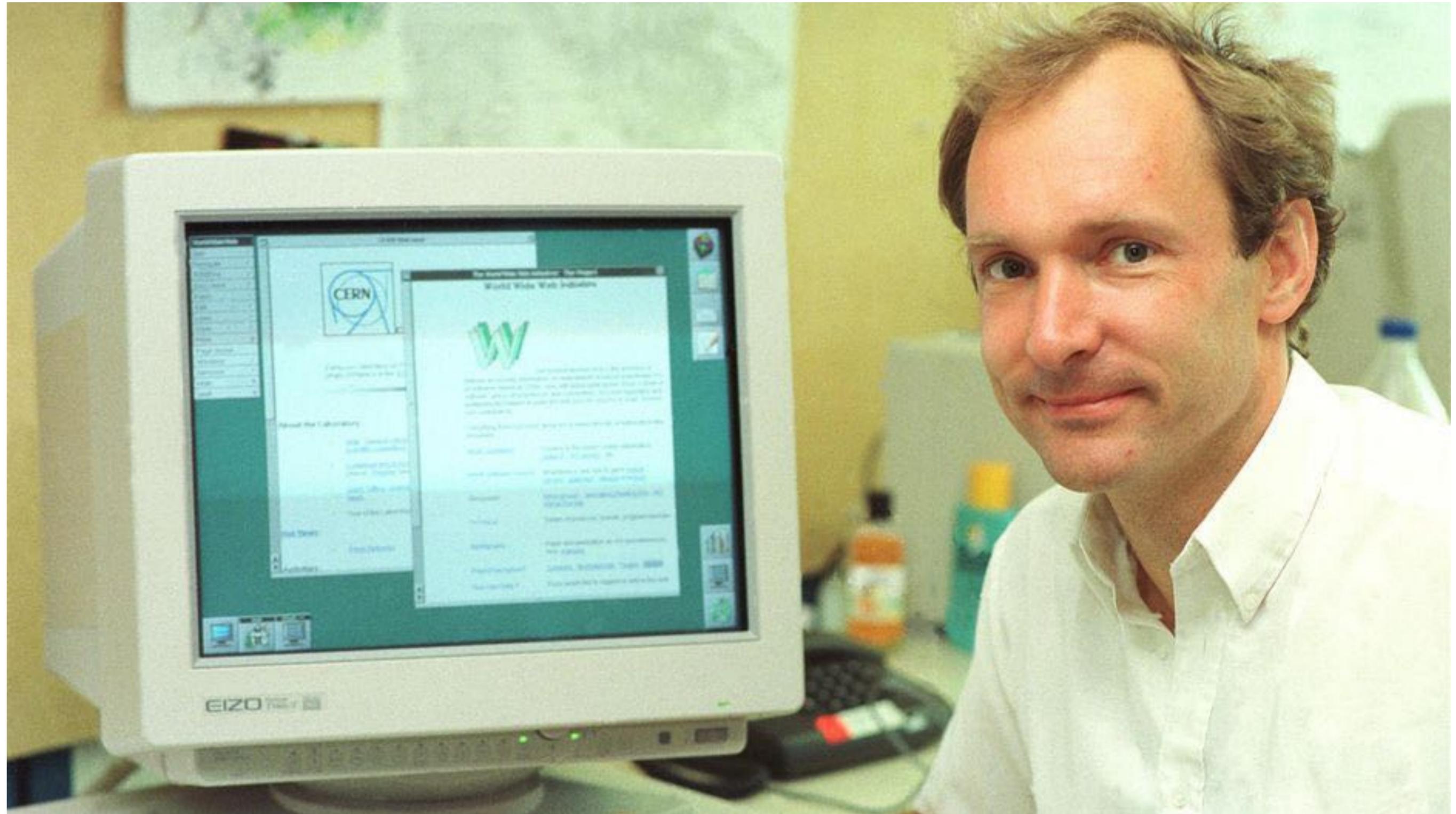


BARBARA OAKLEY, PhD, AND
TERRENCE SEJNOWSKI, PhD,
WITH ALISTAIR McCONVILLE

**Be intentional
by making plans**



Remember: this is for everyone



Slides

mco.dev/introAI.pdf