

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

Understanding Artificial Intelligence

What a well informed person should know

Marc Cohen

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Prerequisites

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

Agenda

- **Definitions - what are the key AI terms?**
- **AI History - how did we get here?**
- **Mechanics - how does AI work?**
- **State of the art - what's possible now?**
- **Ethics - what are some of the pitfalls and concerns?**
- **The Future - where is AI going?**

Non-Goals

- Deep dive into technology or maths
- Definitely answer difficult ethical or societal questions
- Predict the future

Table of Contents

- **My Fave AI App**
- **Definitions**
- **AI History**
- **Mechanics**
- **State of the Art**
- **Ethics**
- **The Future**



Photo by Domenico Loia on [Unsplash](#)

My Fave AI App

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?**

The logo consists of the word "quizaic" in a bold, sans-serif font. The letters are primarily white with a light blue shadow, except for the letter "i" which is red. The logo is set against a solid light blue rectangular background.

quizaic

(pronounced like **mosaic**)

Let's play!

The screenshot shows the Quizaic app interface. At the top, there is a navigation bar with the Quizaic logo and the text "AI Powered Infinitrivia". On the right side of the bar is a circular profile picture of a man wearing a green cap. Below the navigation bar is a vertical sidebar containing five menu items: "Home" (selected), "Browse", "Create", "Play", and "About". The main content area features a large blue banner with the "Quizaic" logo in white and red. Below the banner, the text "AI Powered Infinitrivia" is displayed in a large, bold, blue font. A detailed description follows: "Quizaic leverages the power of generative AI to create and play unlimited trivia quizzes and online surveys. Quizaic is a demonstration app to illustrate what's possible with the combination of Google Cloud services, Flutter, and Vertex AI. Quizaic is not an official Google product and should not be used for commercial purposes."

Quizaic

AI Powered Infinitrivia

AI Powered Infinitrivia

Quizaic leverages the power of generative AI to create and play unlimited trivia quizzes and online surveys. Quizaic is a demonstration app to illustrate what's possible with the combination of Google Cloud services, Flutter, and Vertex AI. Quizaic is not an official Google product and should not be used for commercial purposes.

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**.

Current 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:

Definitions

- **Artificial Intelligence**
- **Machine Learning**
- **Neural Network**
- **Deep Learning**
- **Generative AI**

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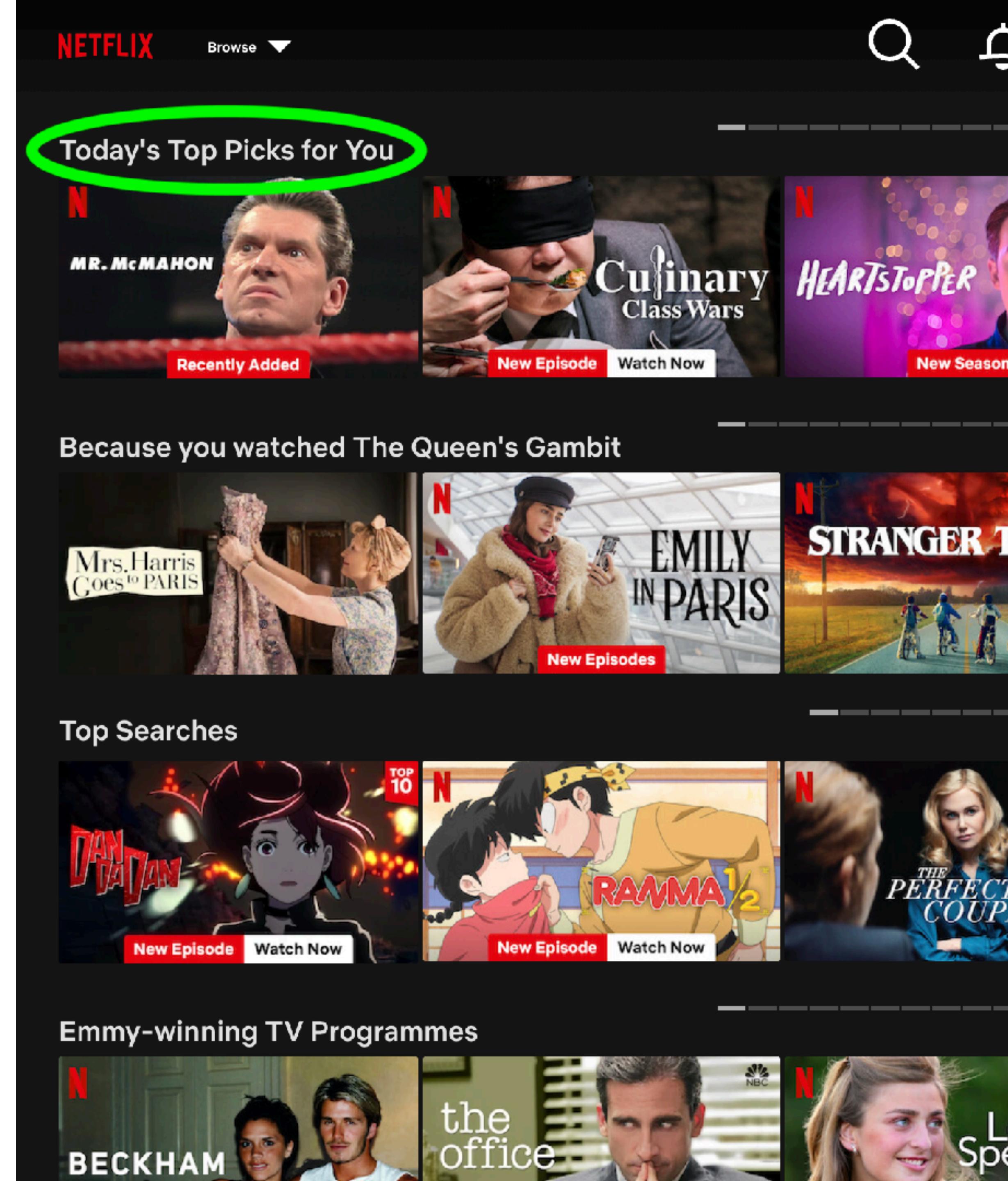
Definition: Artificial Intelligence

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.



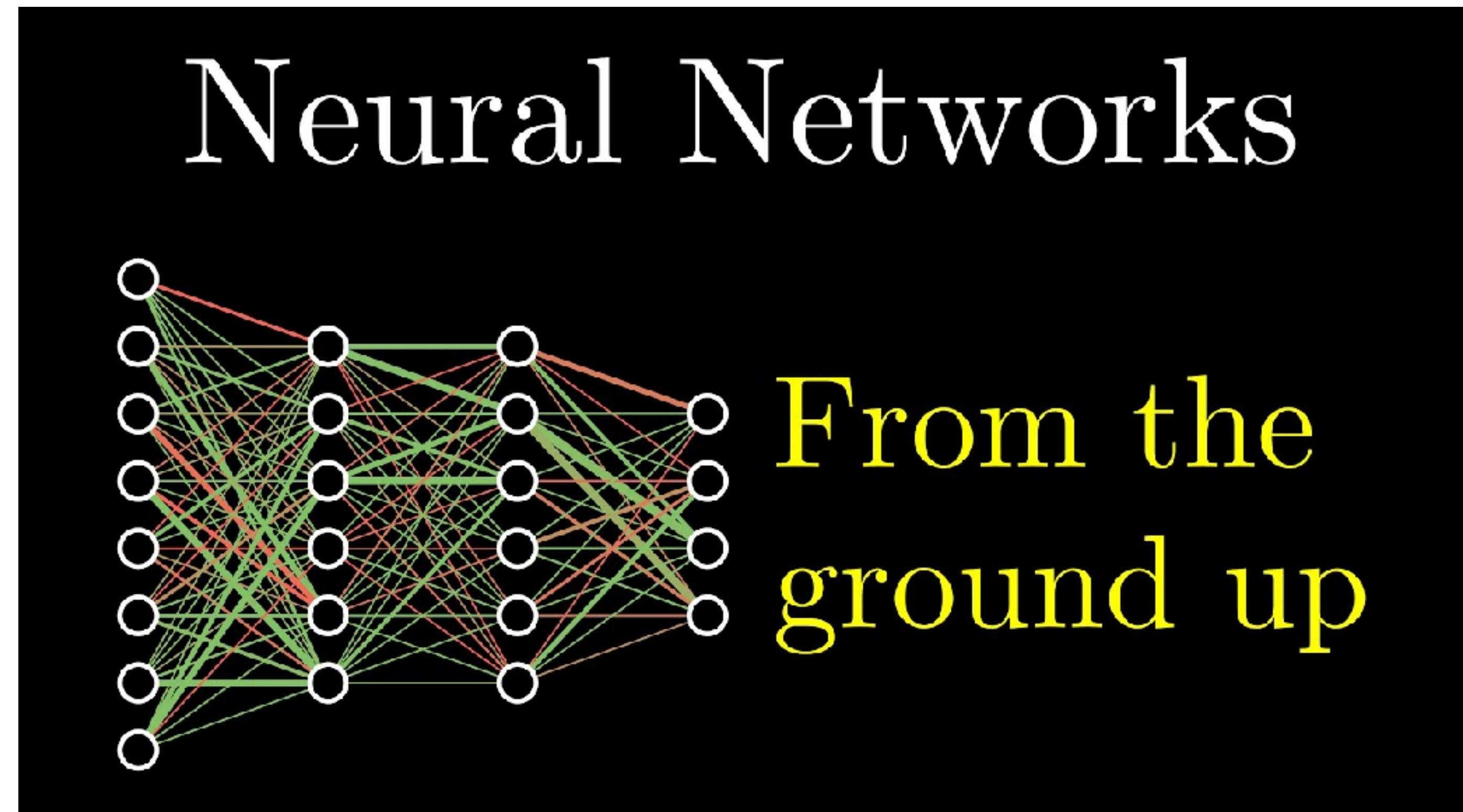
Definition: Machine Learning

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.



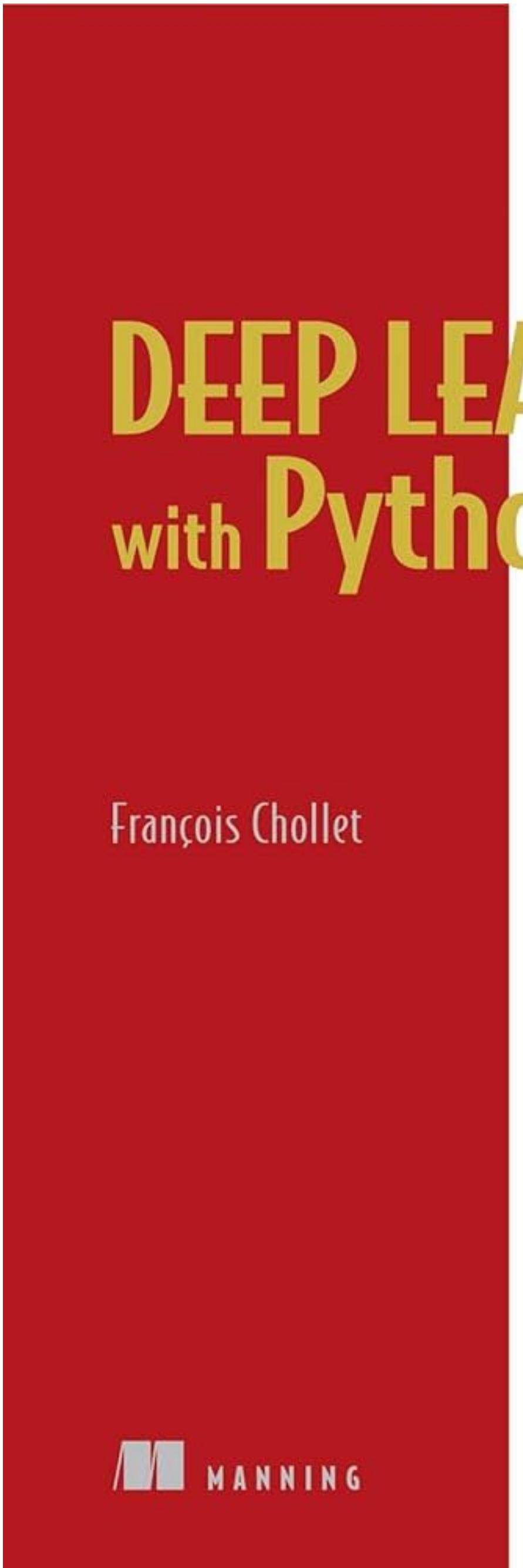
Definition: Neural Networks

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 machine learning that uses multi-layer neural networks to train computers to process data and make human-like decisions. Deep learning systems learn from large amounts of data, including images, text, 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 artificial intelligence, since she recognized the potential for machines to process abstract patterns beyond calculation.



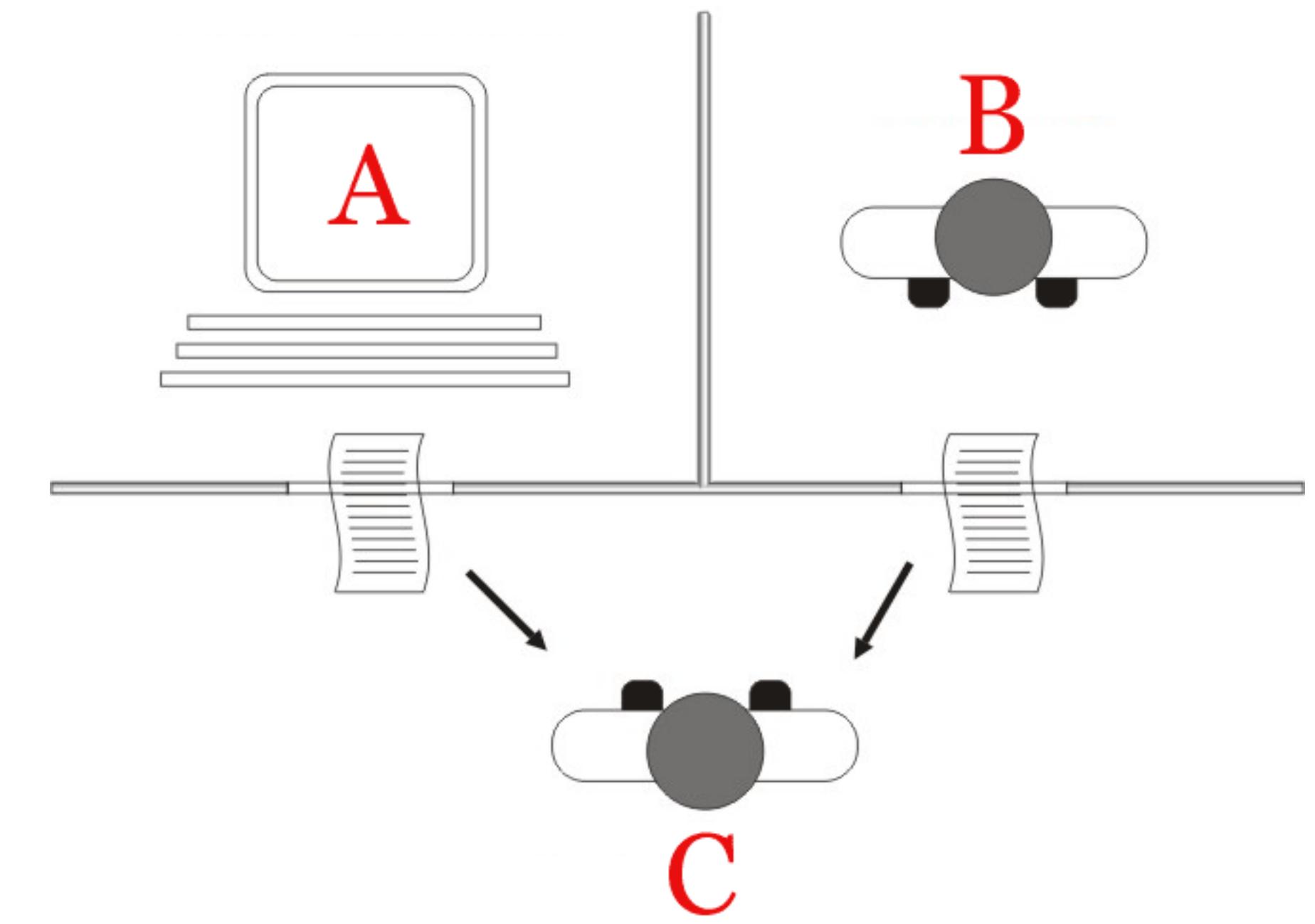
Alan Turing

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.



By Juan Alberto Sánchez Margallo - File:Test_de_Turing.jpg, CC BY 2.5

How Did You Do On The AI Art Turing Test?

...

NOV 20, 2024



Share

...

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

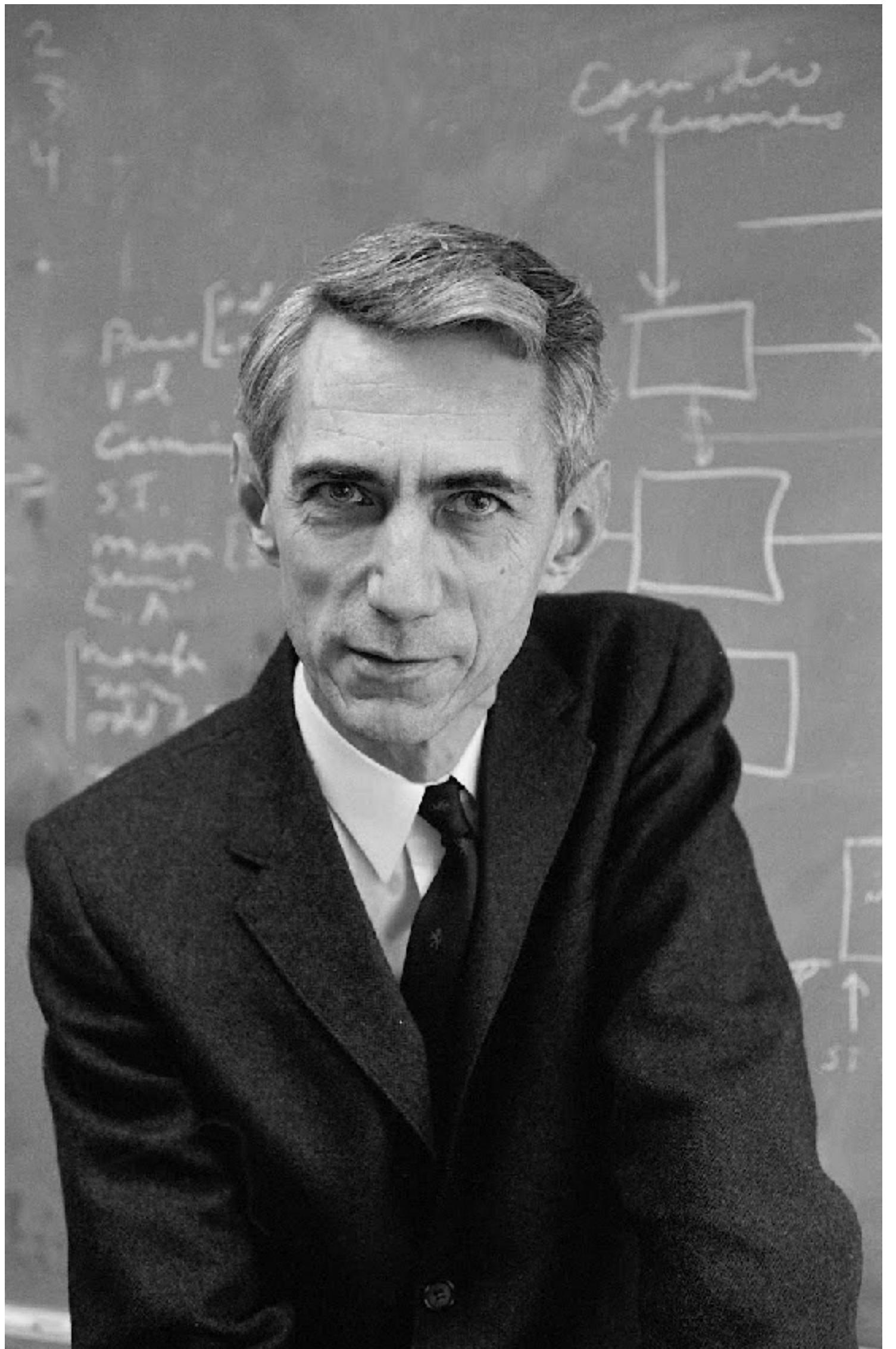
I originally planned five human and five AI pictures in each of four styles: Renaissance, 19th Century, Abstract/Modern, and Digital, for a total of forty. After receiving many exceptionally good submissions from local AI artists, I fudged a little and made it fifty. The final set included paintings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

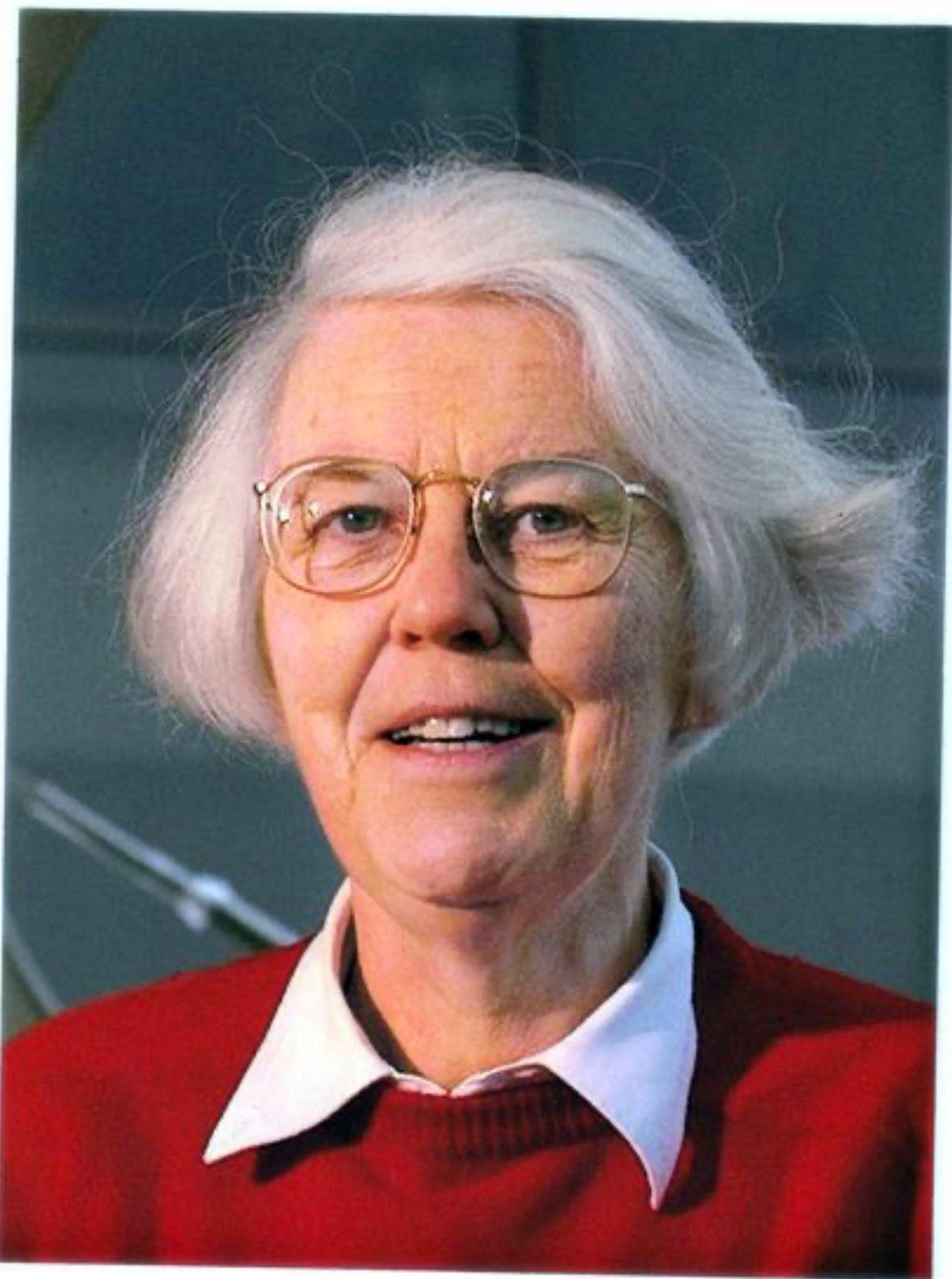
Claude Shannon

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. While not an AI researcher per se, his theories on communication and symbolic processing directly influenced early artificial intelligence, machine learning, and pattern recognition.



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, a breakthrough that continues to underpin AI-driven search and text analysis today.



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 and later co-developed deep belief networks, 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.



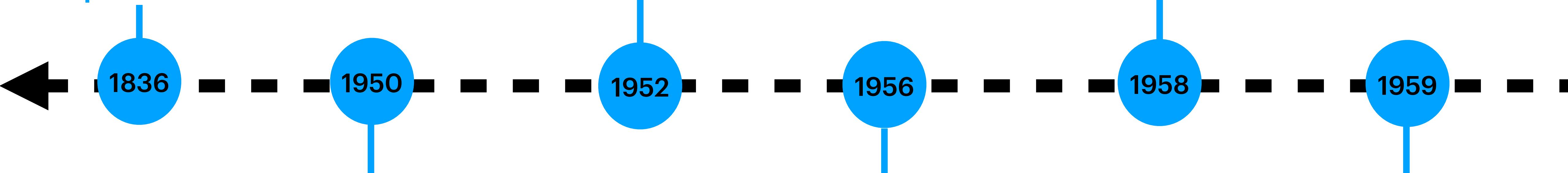
Demis Hassabis

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**, the first system to defeat a world champion in Go, and **AlphaFold**, which solved the decades-old protein folding problem. His leadership has made DeepMind central to advancing deep reinforcement learning and AI for scientific discovery.



AI Development Timeline

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



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

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

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

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

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

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.

1980

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

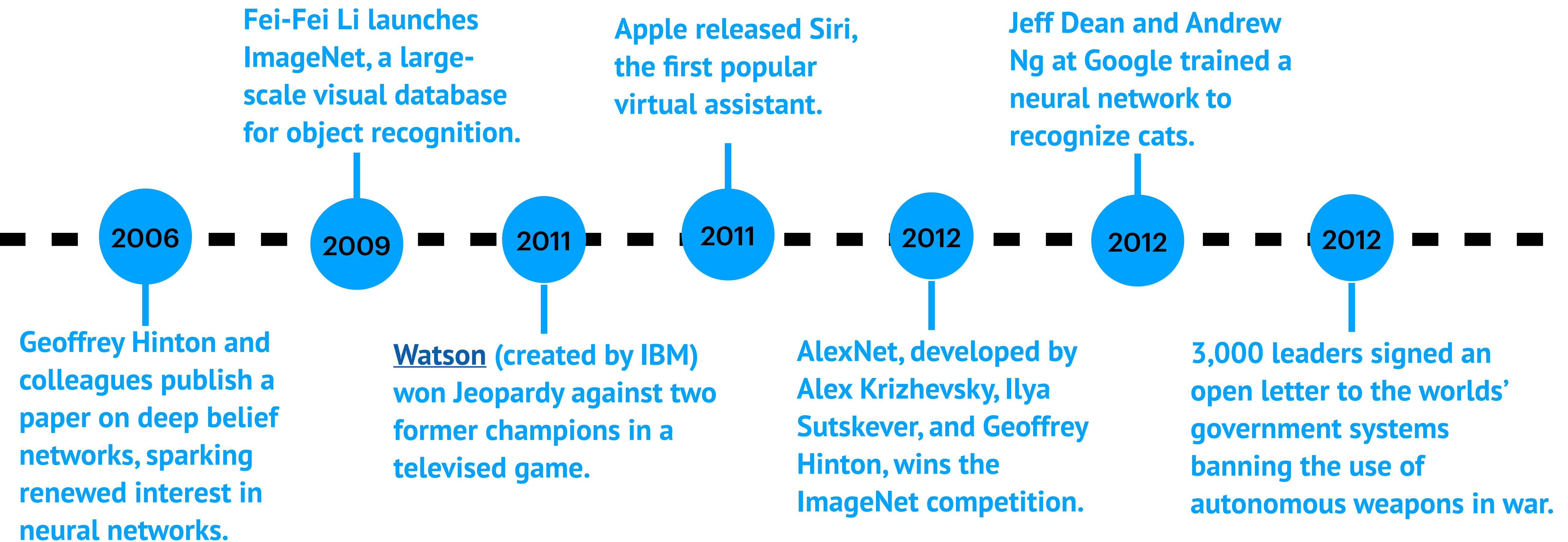
The resurgence of AI interest due to expert systems like MYCIN (medical diagnosis) and DENDRAL (chemical analysis).

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

1986

1997

AI Development Timeline



AI Development Timeline

DeepMind's AlphaGo defeats professional Go player Lee Sedol.

2015

2017

2017

2018

2020

2020

2022

2024

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

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

Chinese Alibaba beat humans on Stanford reading and comprehension test.

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

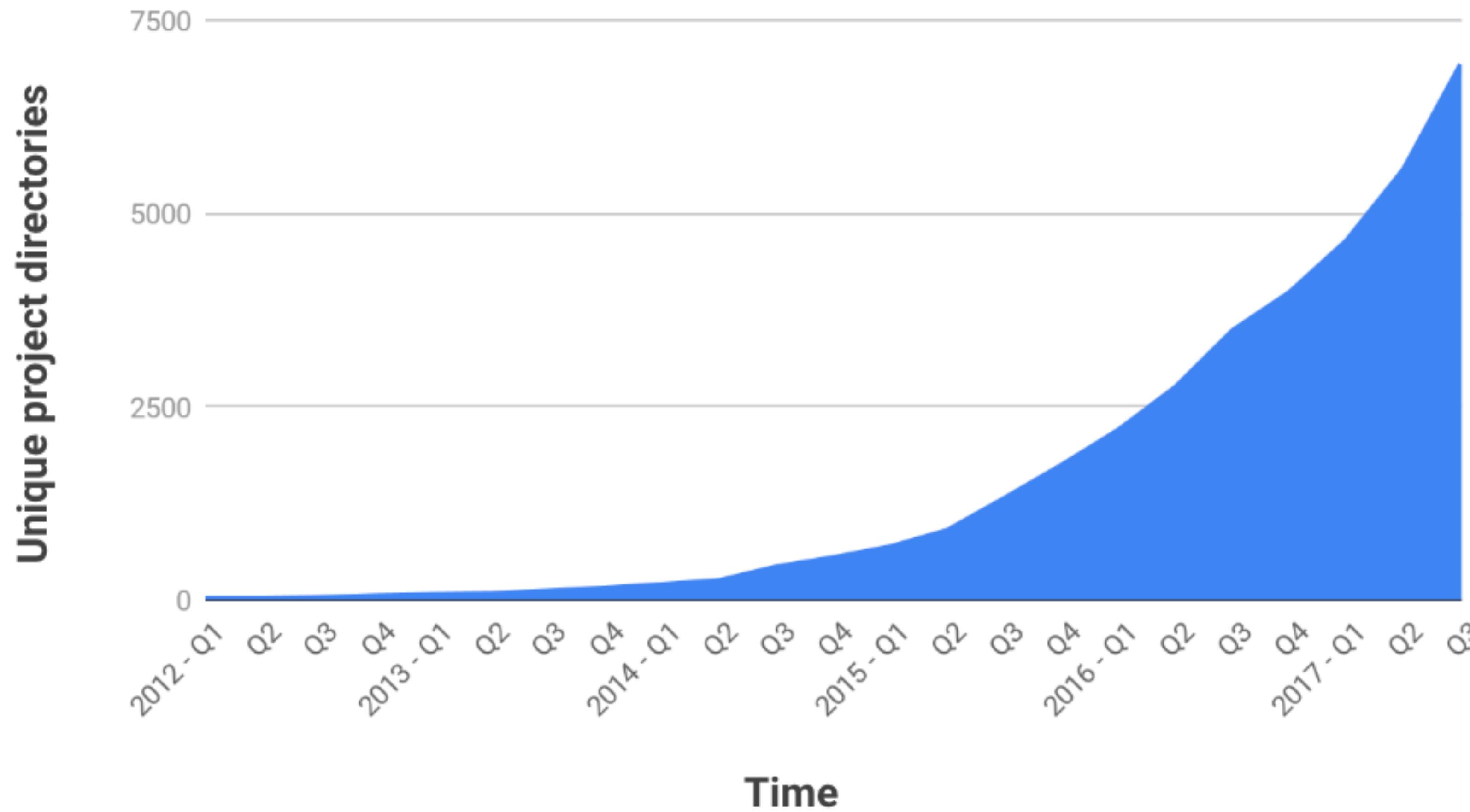
Generative AI goes mainstream with ChatGPT

Open source AI era begins

DeepMind's AlphaFold makes significant progress in protein folding.

Use of Deep Learning at Google

source directories containing deep learning models



Google's AI Awakening

[Sign in / Sign up](#)

Jun Rekimoto : 暮本純一

[Follow](#)

人間とテクノロジーの未来を探求しています。HUMAN AND TECHNOLOGY

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。

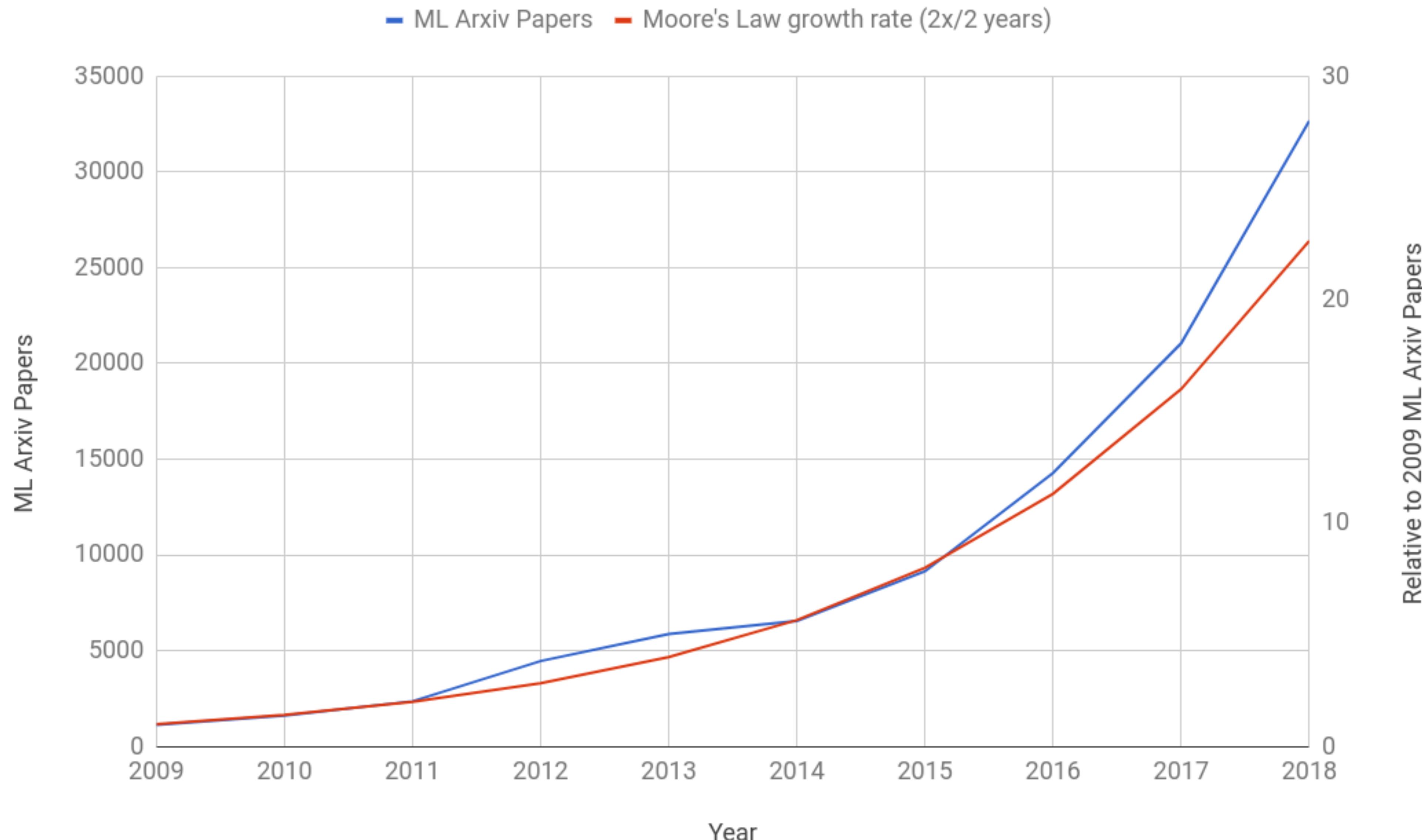
「この世界のすべての人々はあなたが持っていた優位性を持っていないことを覚えておいてください。

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.

Industry Adoption



THE KURZWEIL CURVE

Moore's Law is just the beginning: The power of technology will keep growing exponentially, says Kurzweil. By 2050, you'll be able to buy a device with the computational capacity of all mankind for the price of a nice refrigerator today.

Computer performance

Plotted by number of calculations per second per \$1,000

Years by which, according to
Kurzweil, \$1,000 of computation
will equal (or has already equaled)
the intelligence of ...

... all human brains

... one human brain

... one mouse brain

... one insect brain

Kurzweil's
projected
trend line

• – COMPUTER TYPE

Hollerith Tabulator
Bell Calculator Model I
Univac I

Apple Mac II

1900 1925 1950 1975 2001 '10 '23 2050 2075

10^{40}

10^{30}

10^{20}

10^{10}

1

10^{-10}

Why did everything change so quickly?

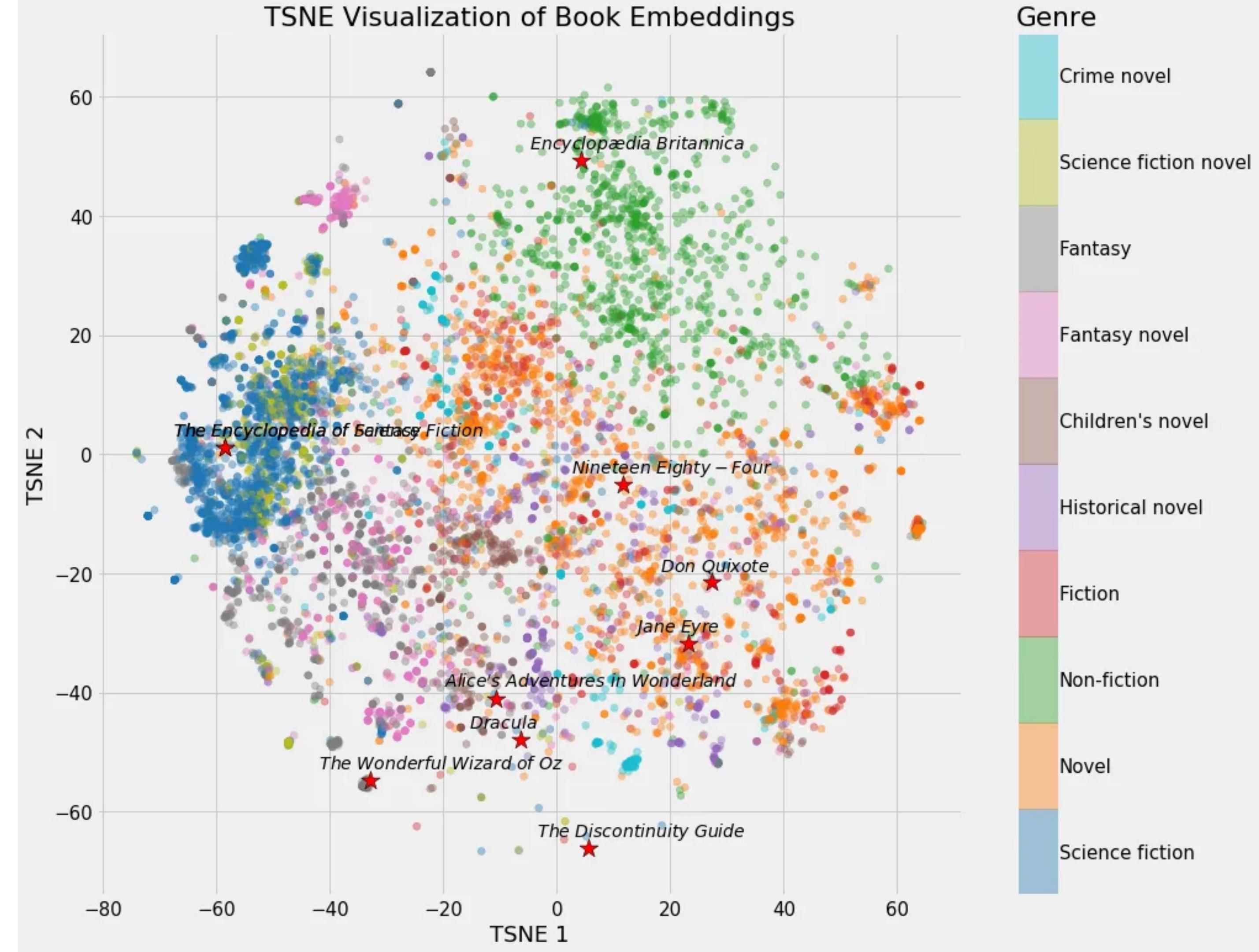
A perfect storm:

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



Mechanics

How does AI work?



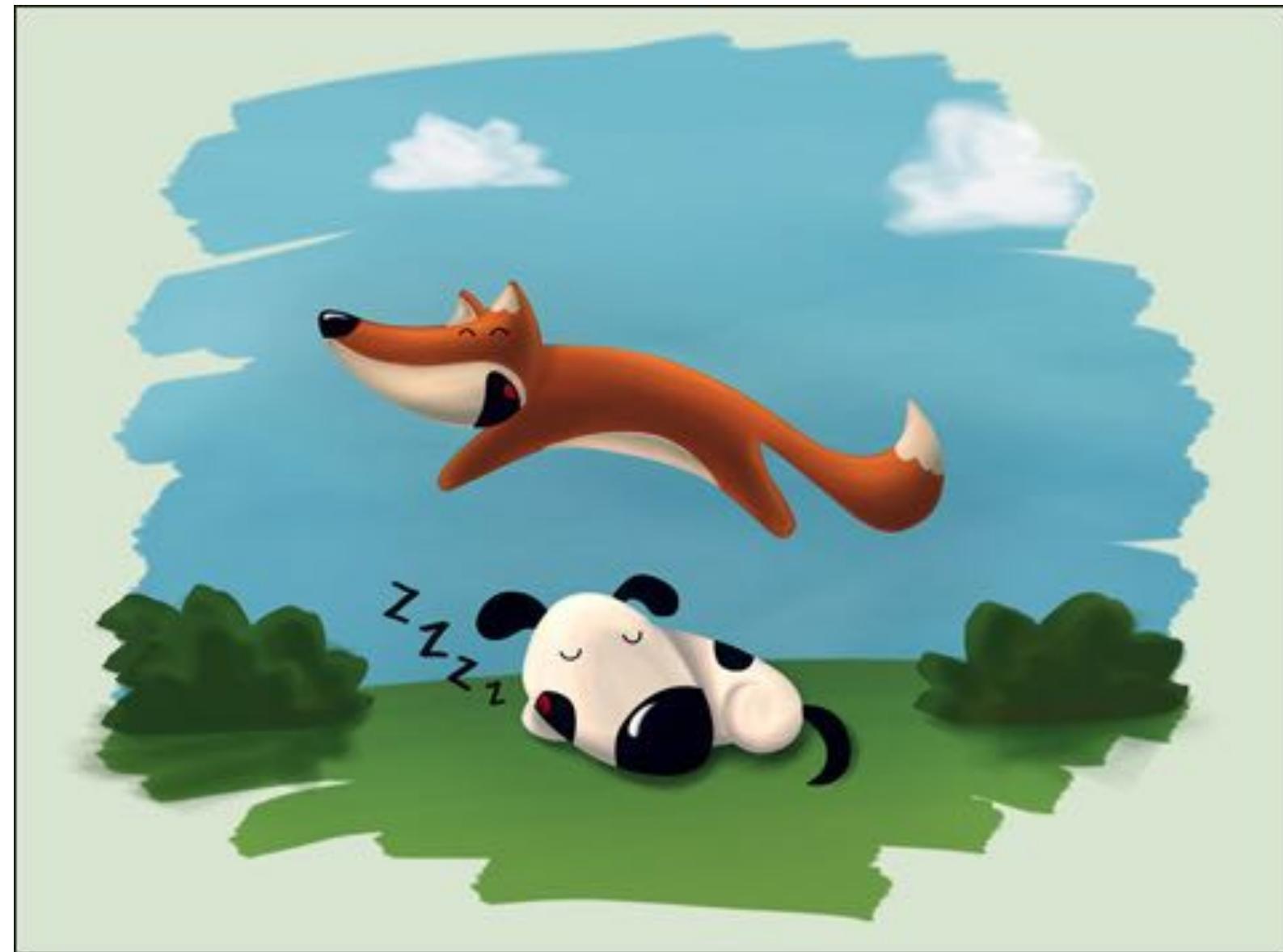
Puppy vs. Muffin



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**

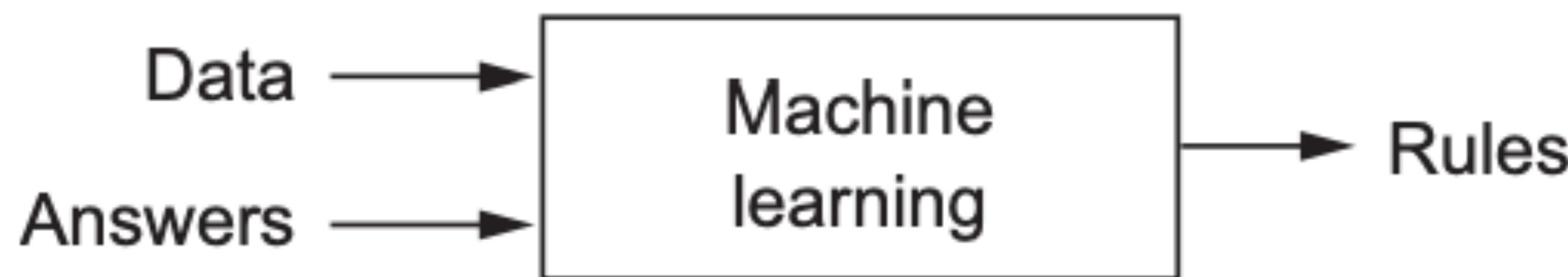
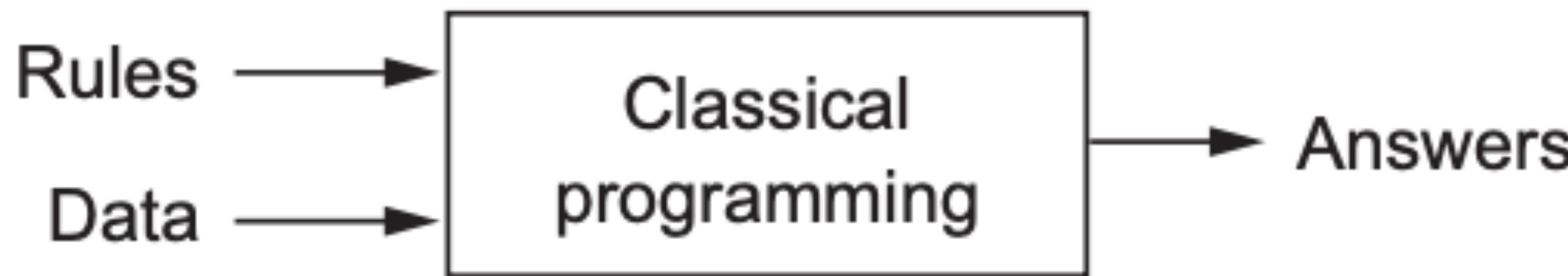


“Instead of trying to produce a program to simulate the adult mind, why not rather try to produce one which simulates the child’s mind?”

- 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

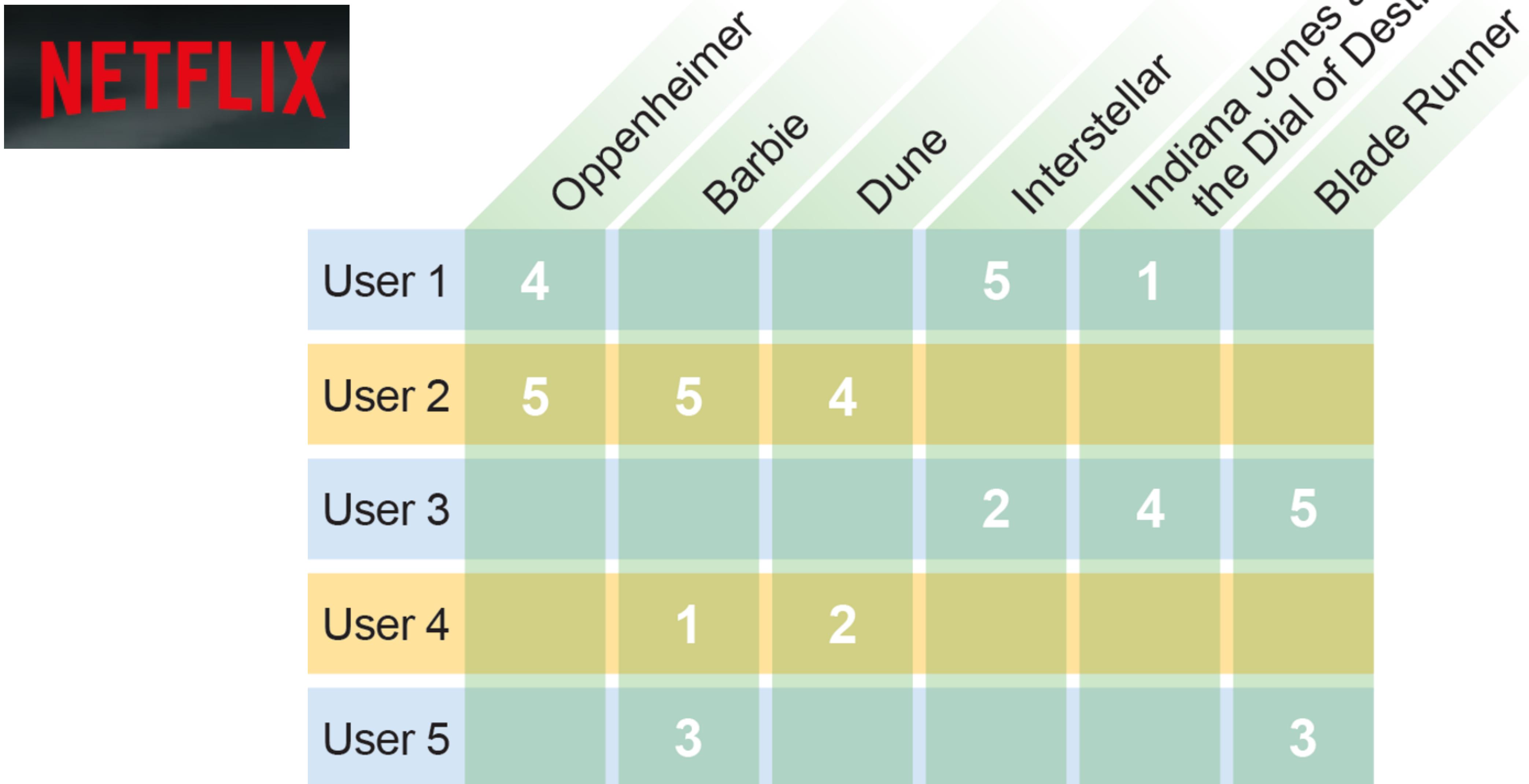
Supervised Learning

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



Cloud of similarities

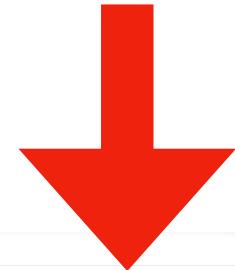


Reinforcement Learning



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

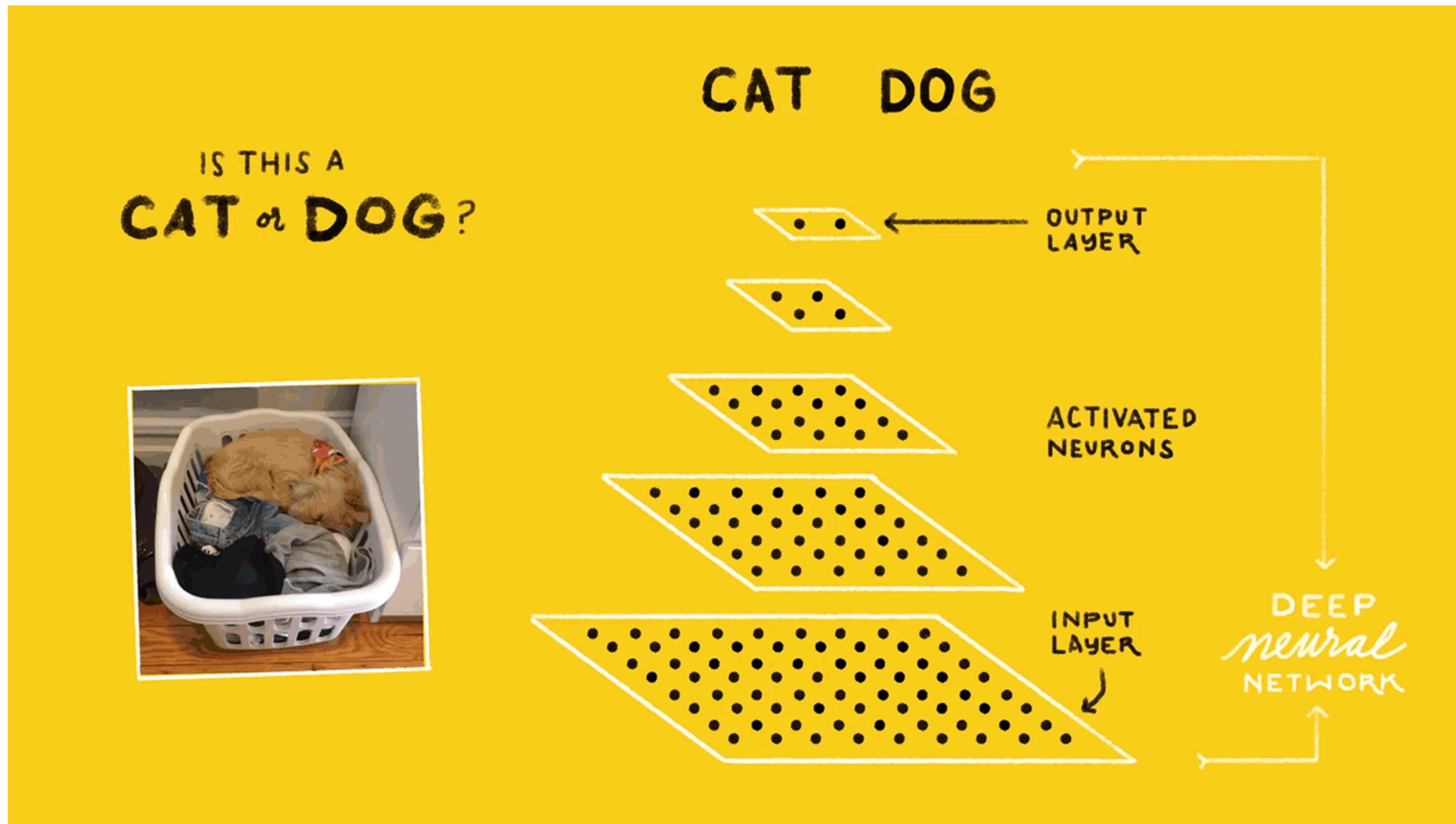
Reinforcement Learning

- reward based
- find optimal strategy

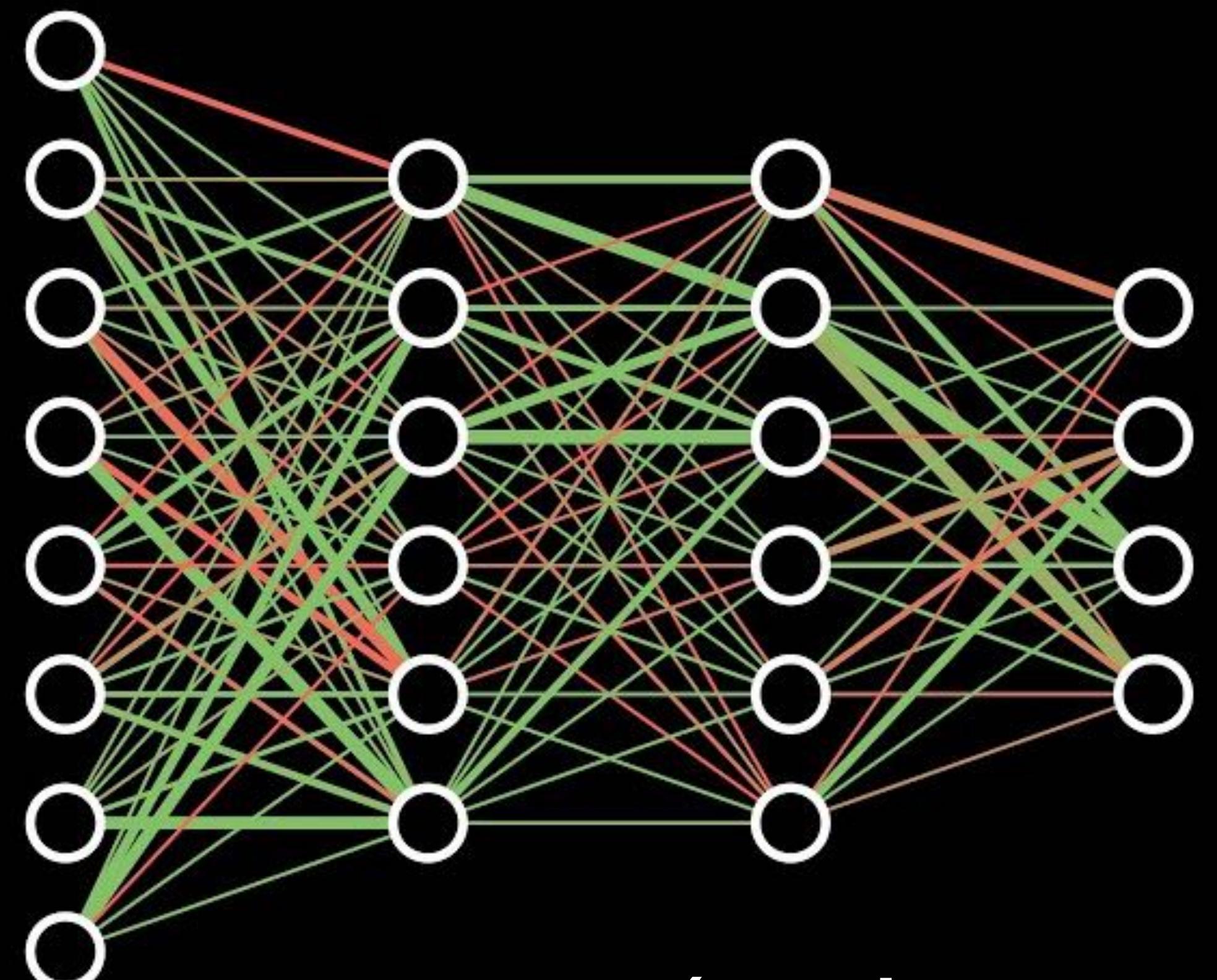
Examples:

- game playing
- autonomous driving

Neural Networks



Neural Networks



From the
ground up

(watch 2:40-5:30, 15:18-16:20)

Which digit is this?



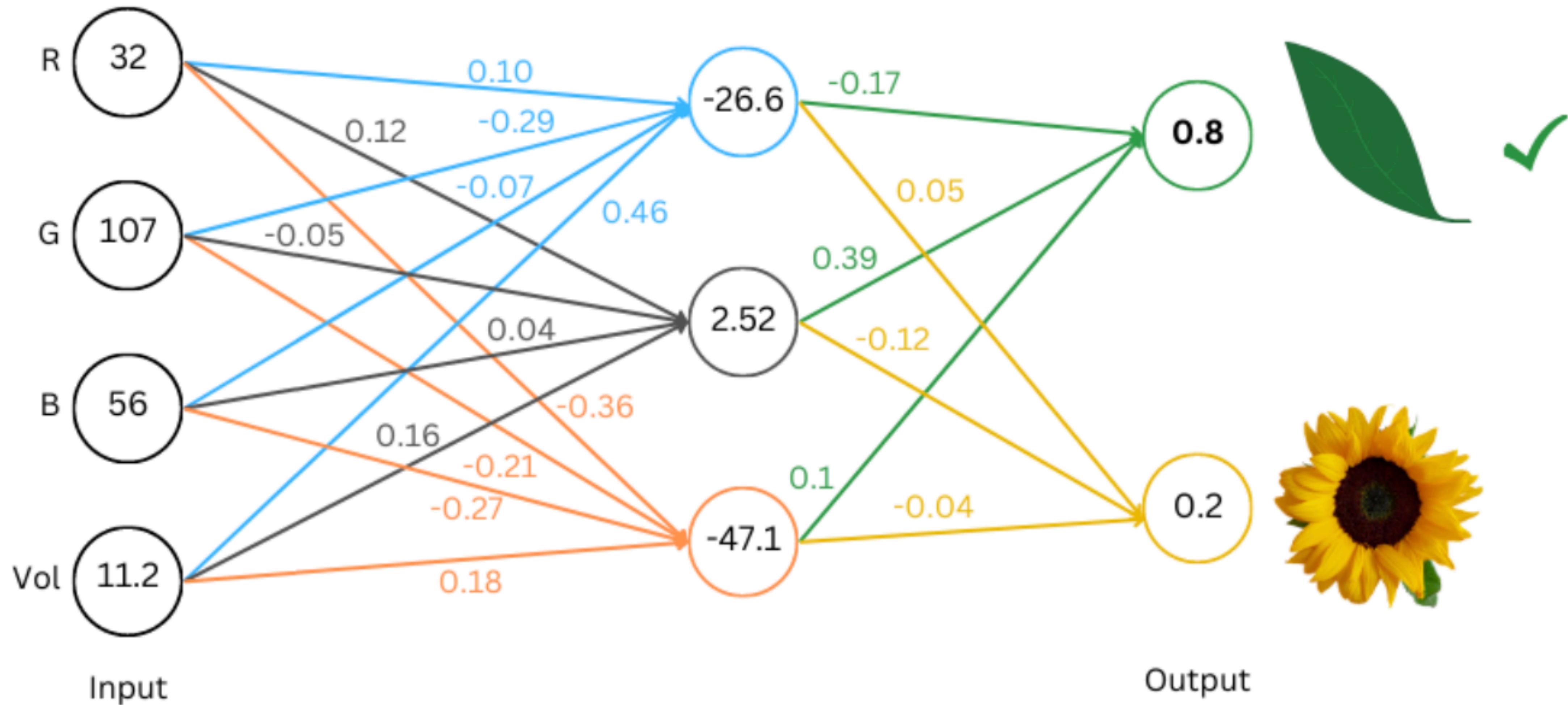
The MNIST Challenge

training digits and their labels	
9	9
1	1
0	0
3	1
1	1
6	6
6	5
5	0
0	5
7	7
2	2
5	5
8	8
4	4
9	9
9	9
7	7
0	0
0	0
4	4
9	9
4	4

validation digits and their labels	
7	7
2	2
1	1
0	0
4	4
1	1
4	4
9	9
5	5
9	0
0	6
6	9
9	0
1	1
5	5
9	9
7	7
3	3
4	4
9	9
6	6
4	5

Training

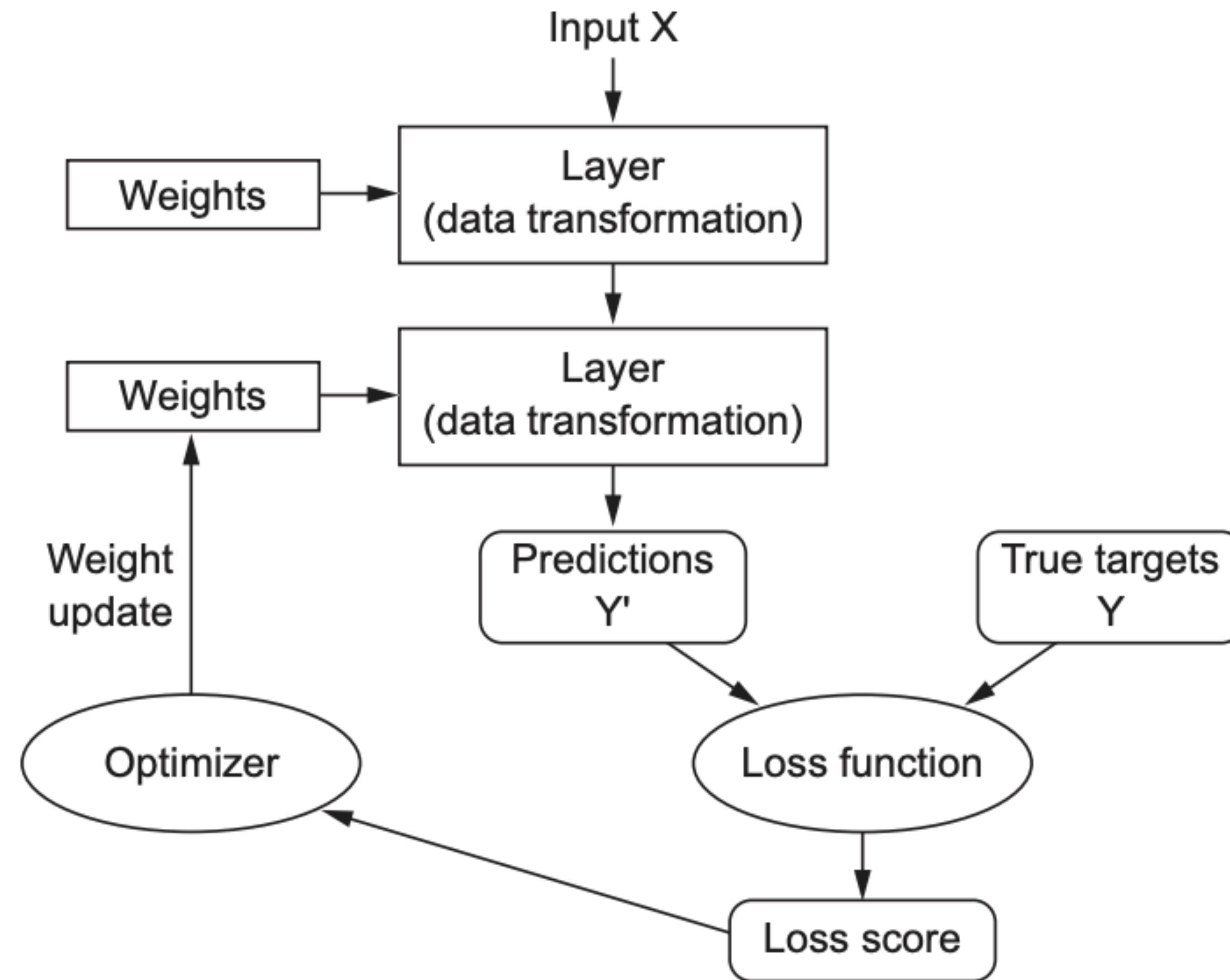




Blue circle like so: $(32 * 0.10) + (107 * -0.29) + (56 * -0.07) + (11.2 * 0.46) = - 26.6$

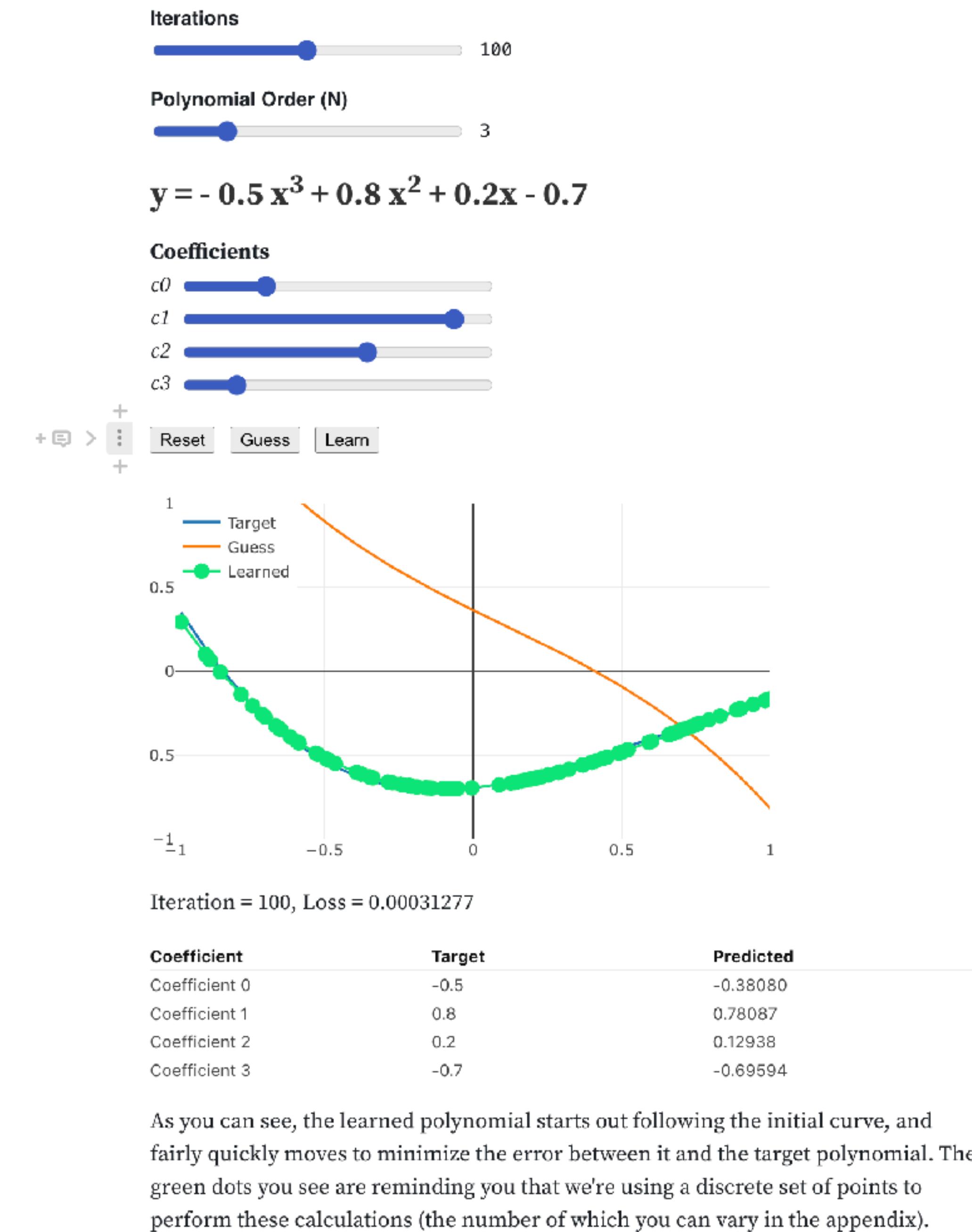
Orange circle like so: $(32 * -0.36) + (107 * -0.21) + (56 * -0.27) + (11.2 * 0.18) = - 47.1$

The Training Process



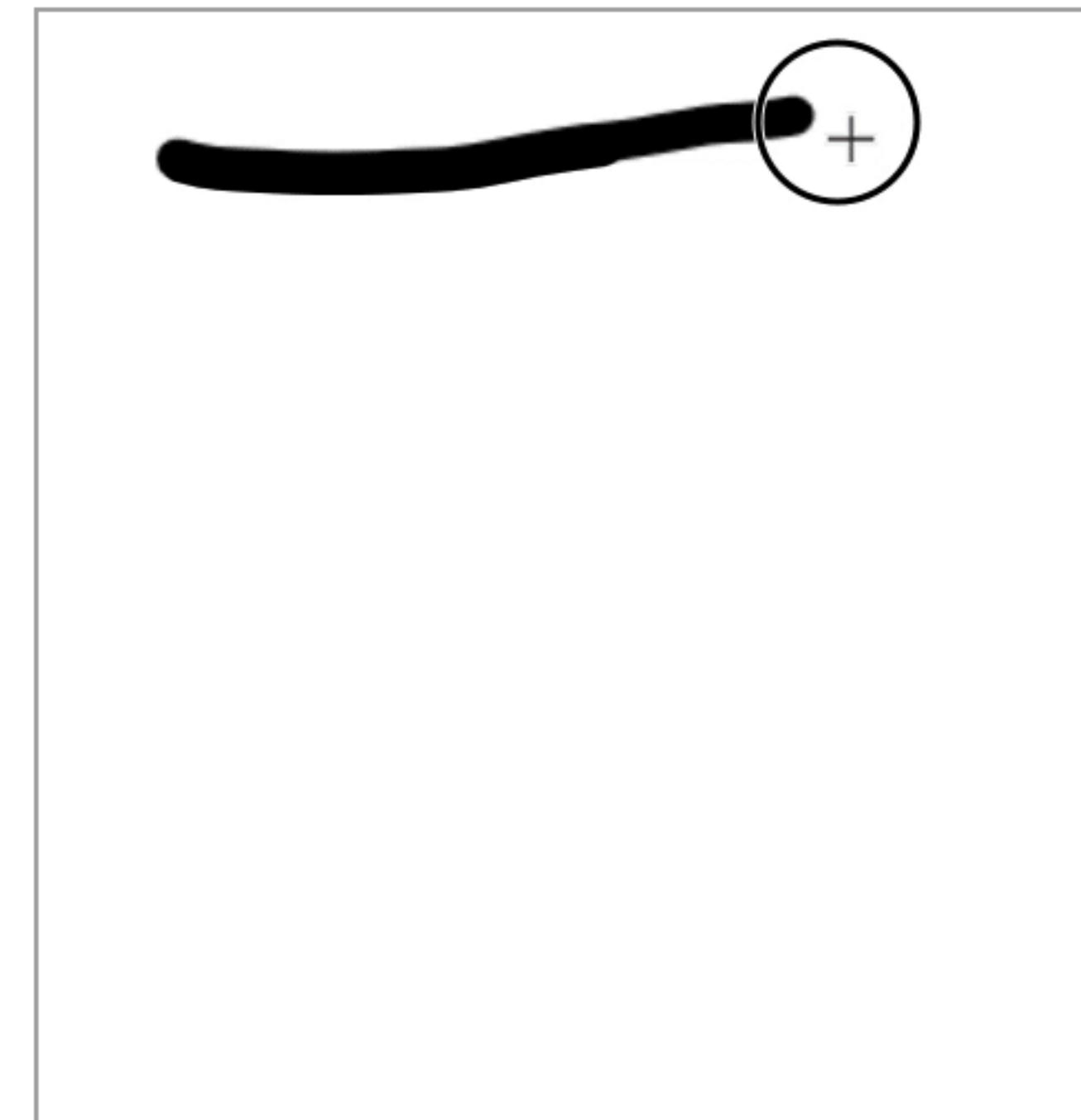
Neural Network Training

- guess values
- improve guess
- repeat until “close enough”



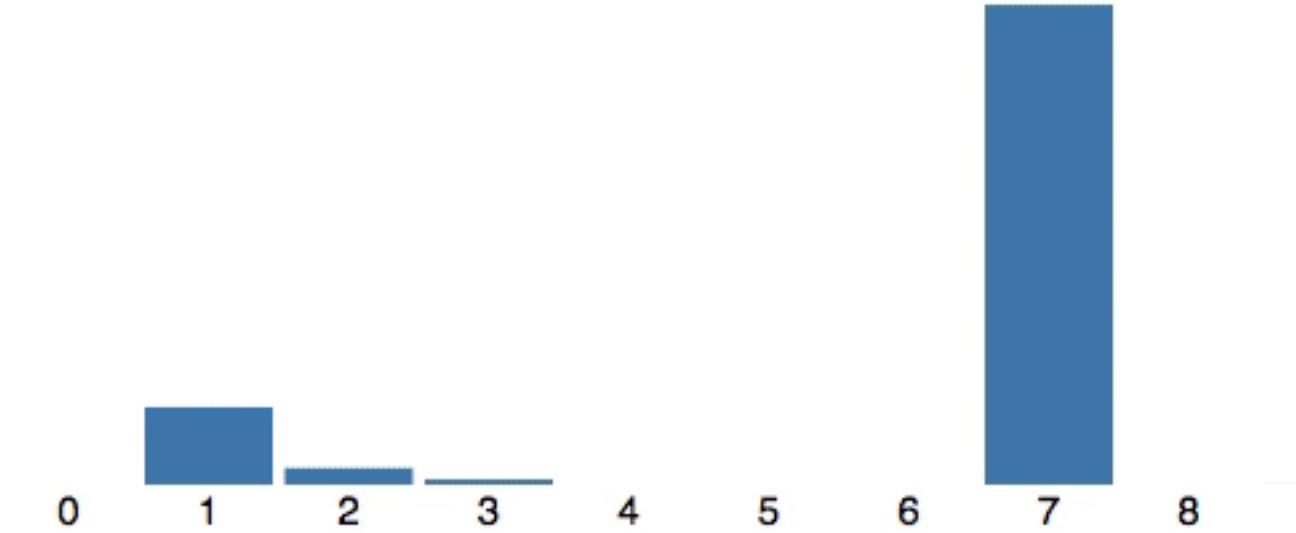
TensorFlow.js + MNIST

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](#).

Let's train a classifier!

mco.fyi/classifier

The screenshot shows a Jupyter Notebook interface. At the top, there is a toolbar with a 'CO' logo, a file named 'mco_classifier.ipynb', and various icons for file operations like star, cloud, and share. Below the toolbar is a menu bar with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. To the right of the menu is a 'Share' button, a 'Gemini' status indicator, and a user profile icon. The main area contains a code cell with the title 'Intro to AI: Train a Simple Classifier'. The cell content includes a welcome message, a description of the goal (exploring what it feels like to "program" an AI), and a note that no background knowledge is required. Below this, a section titled '1. What is AI?' lists several bullet points about Artificial Intelligence (AI) and its capabilities.

CO mco_classifier.ipynb ⭐ ☁

File Edit View Insert Runtime Tools Help

Commands + Code + Text ▶ Run all Reconnect ^

Share Gemini

Intro to AI: Train a Simple Classifier

Welcome!

In this notebook, we'll explore **what it feels like to "program" an AI** — in the simplest possible way.

You don't need any background in math or coding. Just follow along, run the code cells, and observe what happens.

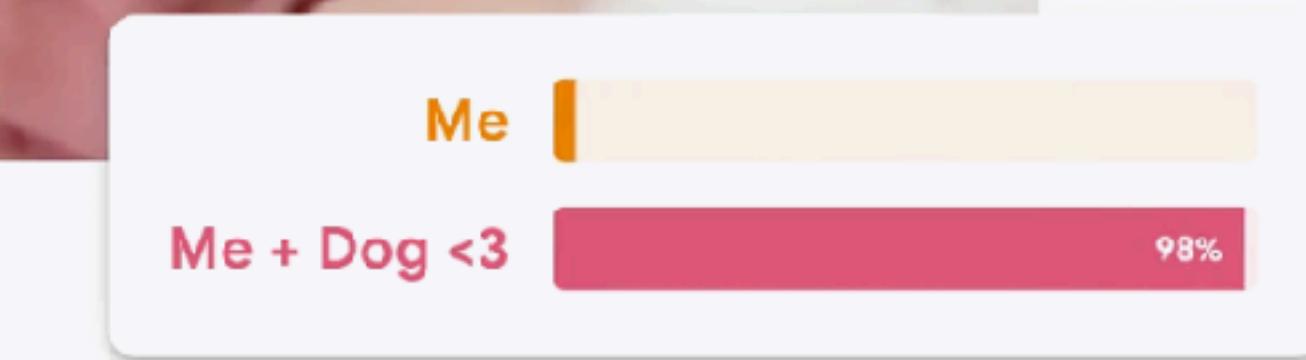
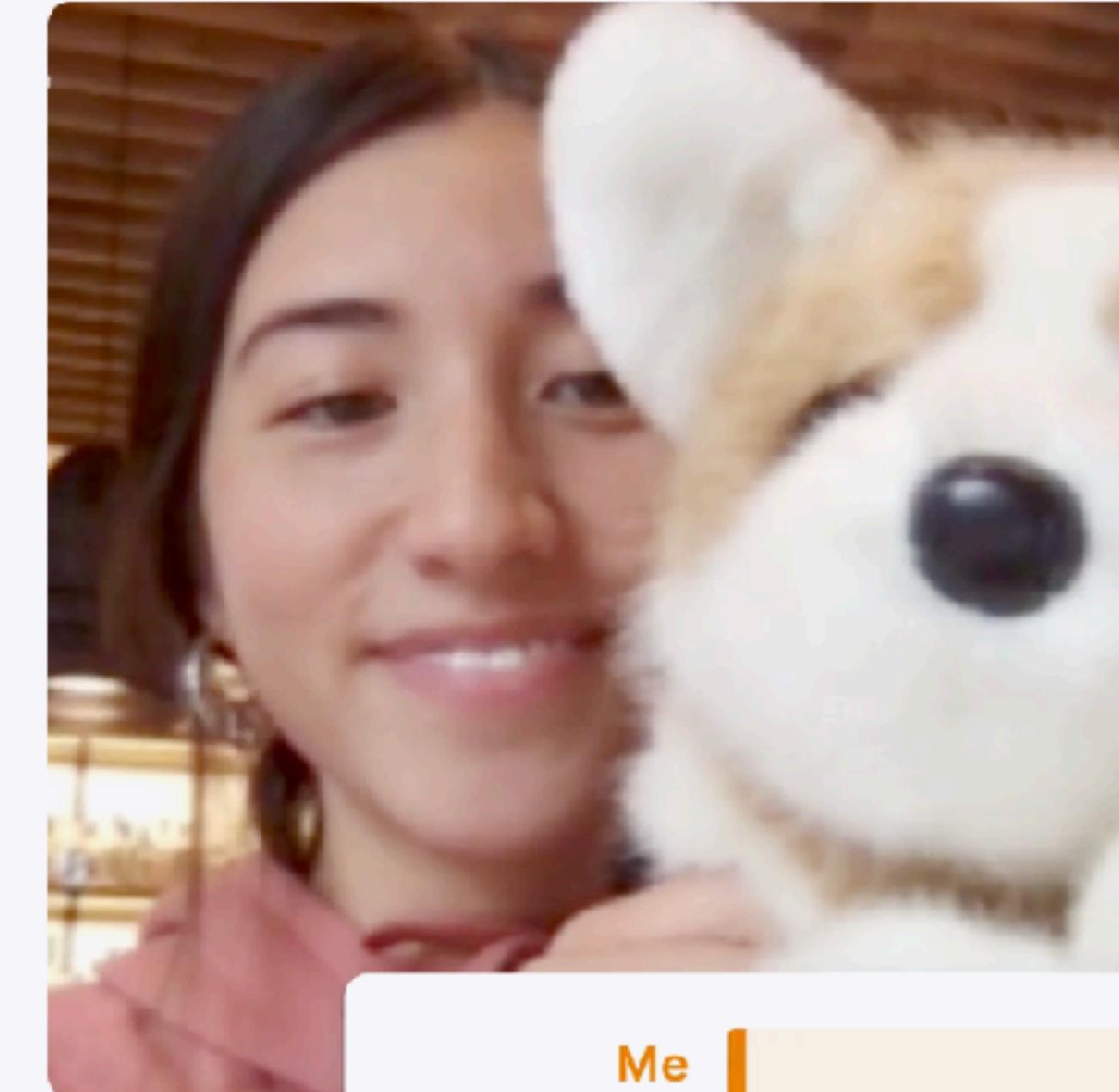
1. What is AI?

- **Artificial Intelligence (AI)** is when computers learn from data and make decisions or predictions.
- Today, we'll see how an AI can:
 1. Learn from **examples** (training data).
 2. Make **predictions** on new cases.
 3. Show us how well it did.

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](#)



ml5



p5.js



Coral



node



js



TensorFlow



TensorFlow



ARDUINO

“I.”

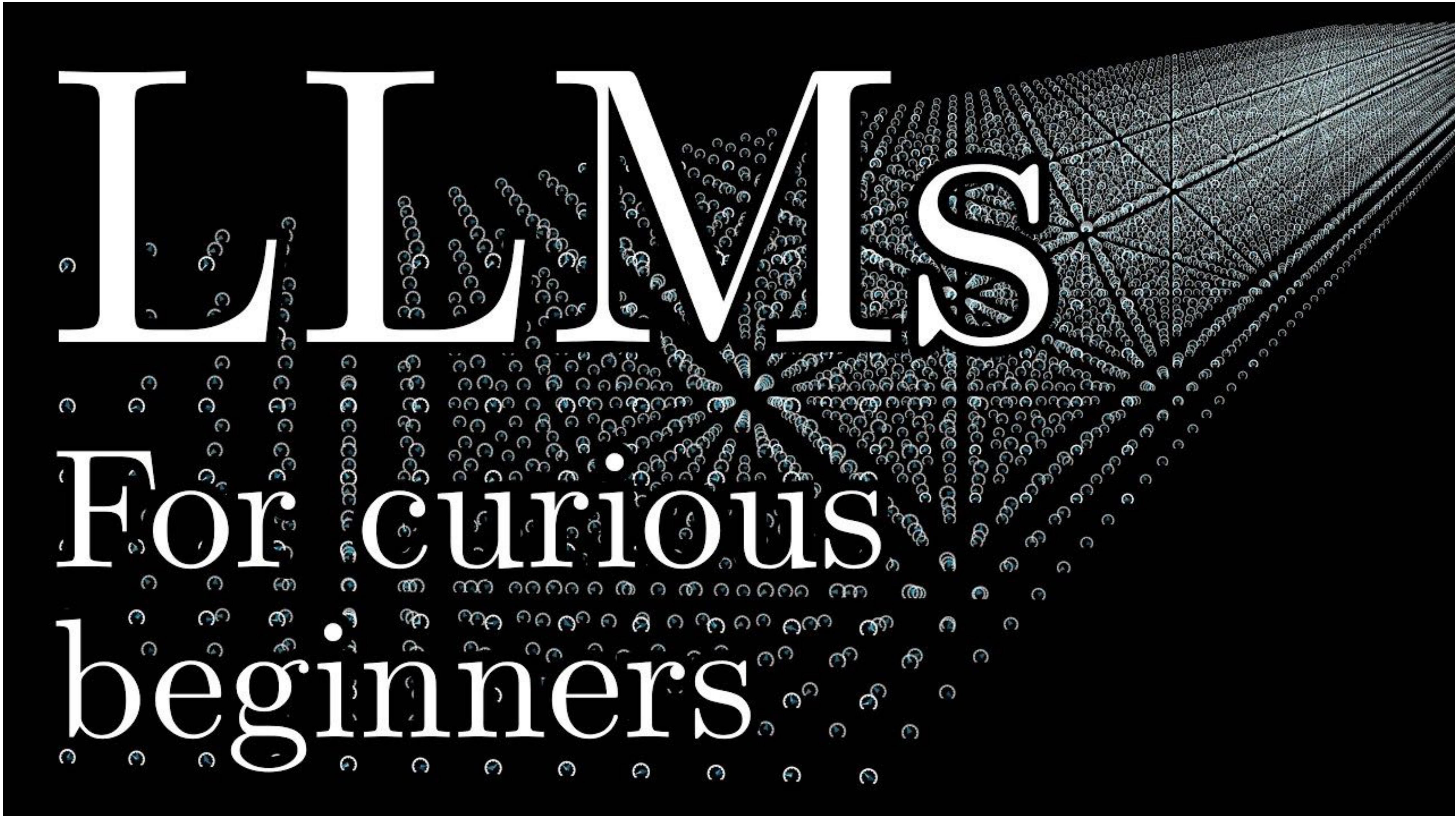
“WANT.” “HAIR!”

**(IMPROVISERS / GET
PERSONAL)**



TUMS

For curious
beginners

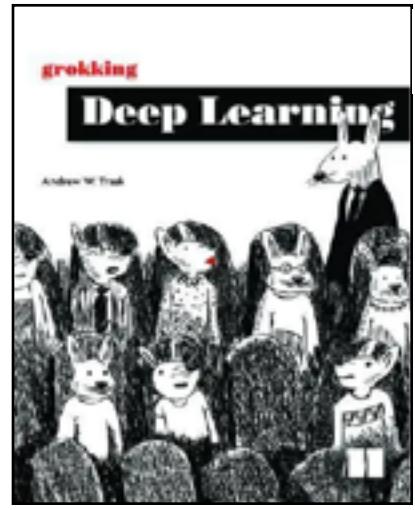


Embeddings

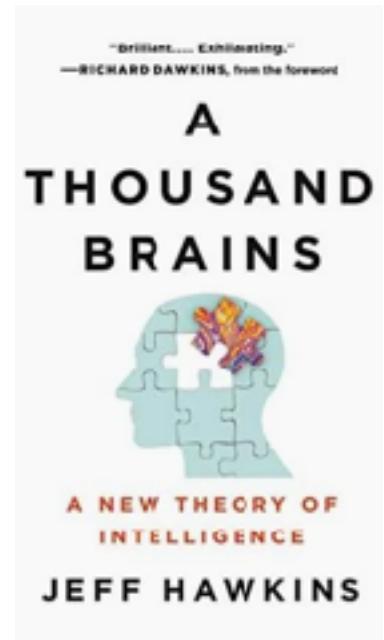
(The secret sauce of deep learning)

Recommending AI Books

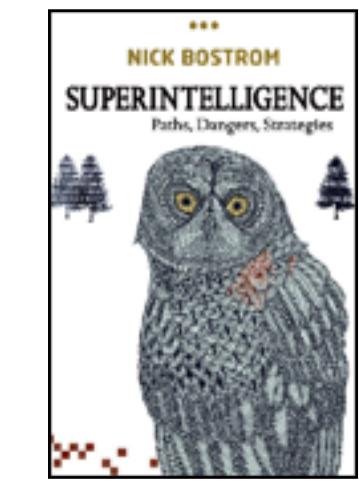
Beginner



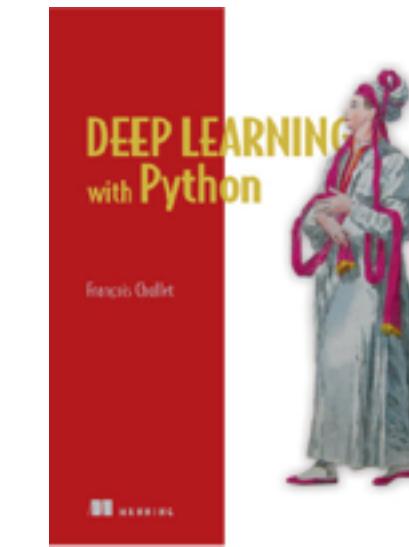
[-5]



[-3]



[2]

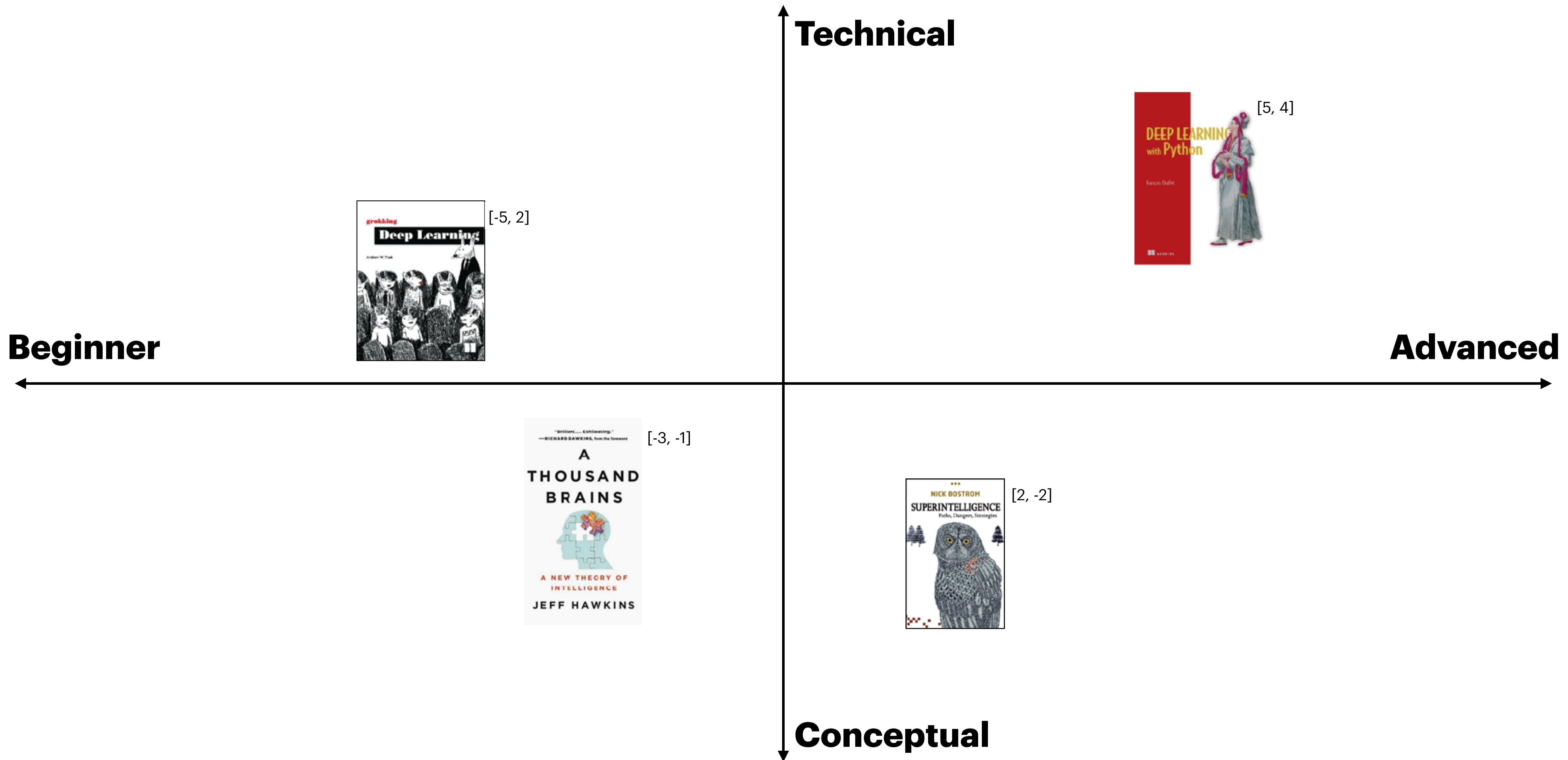


[5]

Advanced



Better: 2-D Coordinate System



Even better: use N-dimensions

- Based on the labelled training data, neural networks are able to “embed” data (words, images, video, audio) into N-dimensional space.
- We can represent embeddings as sequences of numbers, aka vectors:
 - [a₀, a₁, a₂, ..., a_N]
 - Similar objects get embedded in similar locations in N-space.
 - This gives us the ability to do *semantic search*, i.e., find things that have similar meaning.

Embeddings In Action

←

🔍 dog in water X

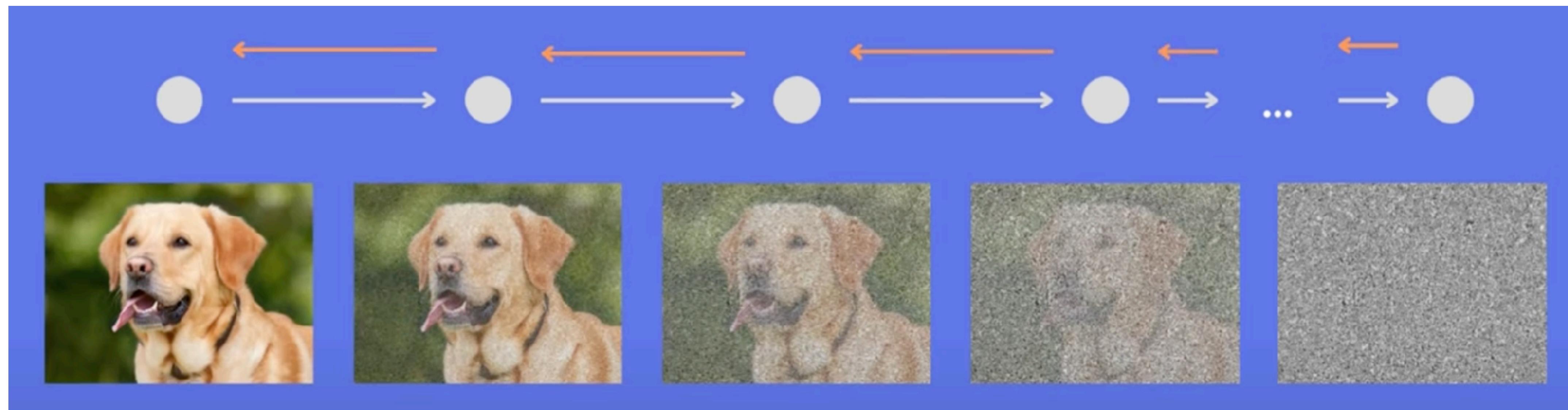
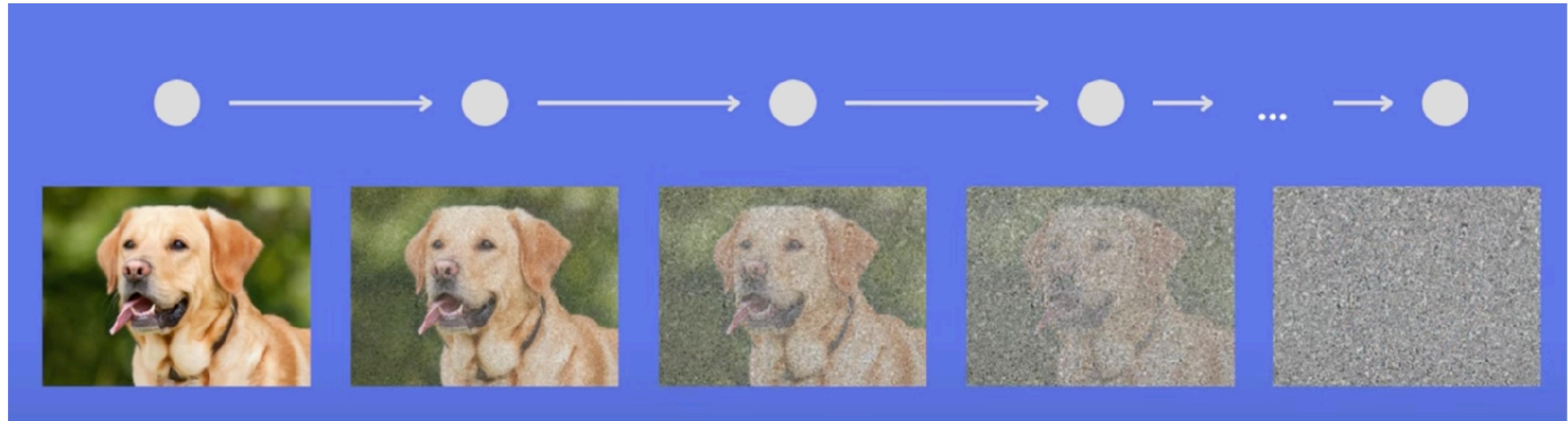
✓ Sat, May 15, 2021

▼

Embeddings Example

projector.tensorflow.org

Diffusion Models



MJ

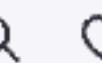
What will you imagine?



Search



berada.travel 15h



A child is playing with a baby
koala really tiny, they both seem
to be friends. The photo should
look real and not a cartoon.

ar 9:16 v 6.1

Use

Image

Style

Prompt

State of the Art

**Discussion topic:
How are you using AI?**

Key advances driving state-of-the-art AI

- **Generative AI (text, images, music, video, code)**
- **Multimodal AI (systems that handle text, images, sound together)**
- **Reasoning & problem solving (agents that plan, simulate, take steps)**
- **Embodied AI (robots, drones, autonomous vehicles)**
- **Specialist AI (healthcare, climate science, finance, creative industries)**

Answering Questions

What can I help with?

0 Message ChatGPT



Create image

Summarize text

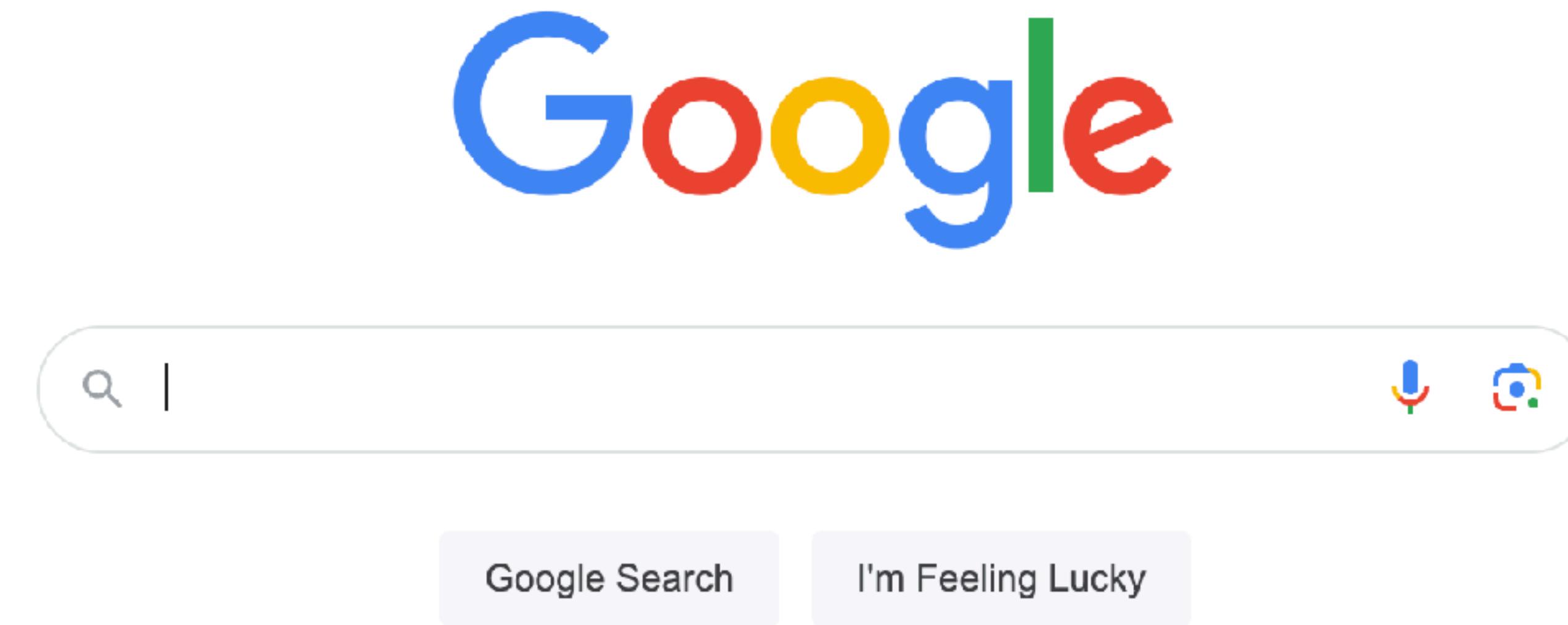
Brainstorm

Code

Make a plan

More

Does that look familiar?



[All](#) [Images](#) [Videos](#) [Web](#) [News](#) [Books](#) [Maps](#) [More](#)[Tools](#)

AI Overview

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.

[Learn more](#)

Transformers in Artificial Intelligence - AWS

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

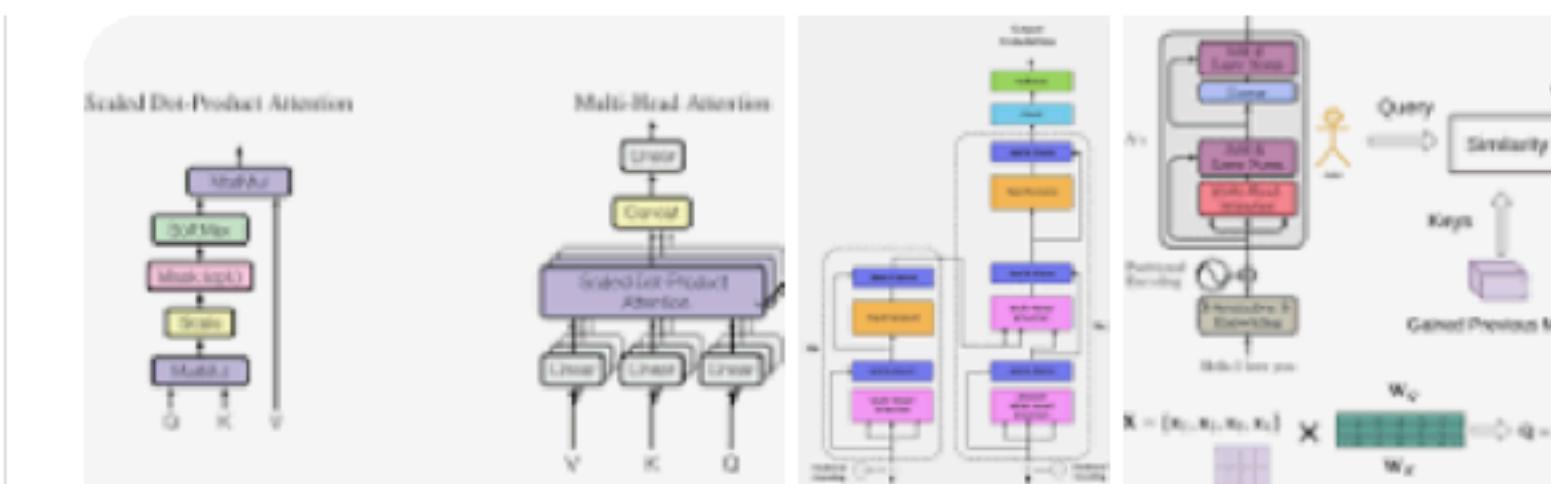
AWS

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.



How Chinese A.I. Start-Up DeepSeek Is Competing With Silicon Valley Giants

The company built a cheaper, competitive chatbot with fewer high-end computer chips than U.S. behemoths like Google and OpenAI, showing the limits of chip export control.



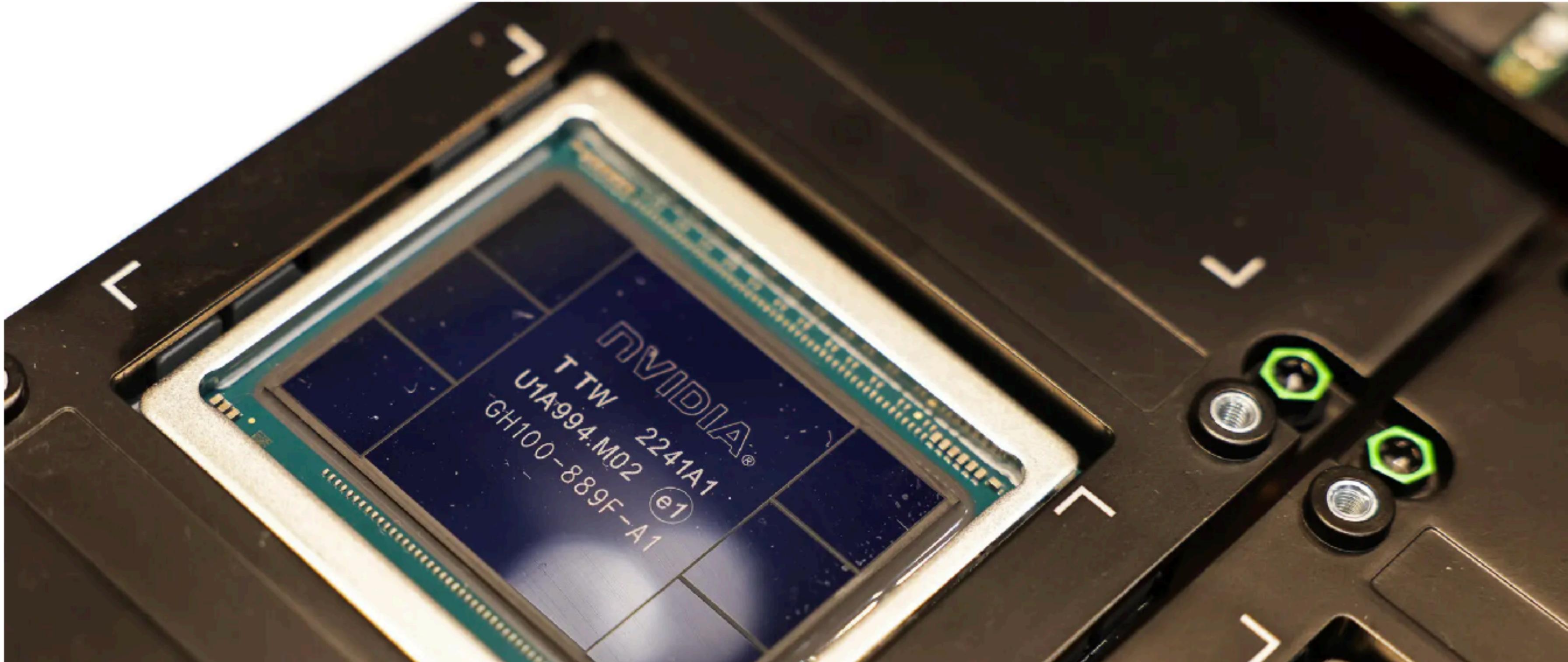
Listen to this article · 8:27 min [Learn more](#)



Share full article



204



- released Jan 2025
- comparable to OpenAI's o1
- reinforcement learning
- distillation

Abstract

We introduce our first-generation reasoning models, DeepSeek-R1-Zero and DeepSeek-R1. DeepSeek-R1-Zero, a model trained via large-scale reinforcement learning (RL) without supervised fine-tuning (SFT) as a preliminary step, demonstrates remarkable reasoning capabilities. Through RL, DeepSeek-R1-Zero naturally emerges with numerous powerful and intriguing reasoning behaviors. However, it encounters challenges such as poor readability, and language mixing. To address these issues and further enhance reasoning performance, we introduce DeepSeek-R1, which incorporates multi-stage training and cold-start data before RL. DeepSeek-R1 achieves performance comparable to OpenAI-o1-1217 on reasoning tasks. To support the research community, we open-source DeepSeek-R1-Zero, DeepSeek-R1, and six dense models (1.5B, 7B, 8B, 14B, 32B, 70B) distilled from DeepSeek-R1 based on Qwen and Llama.

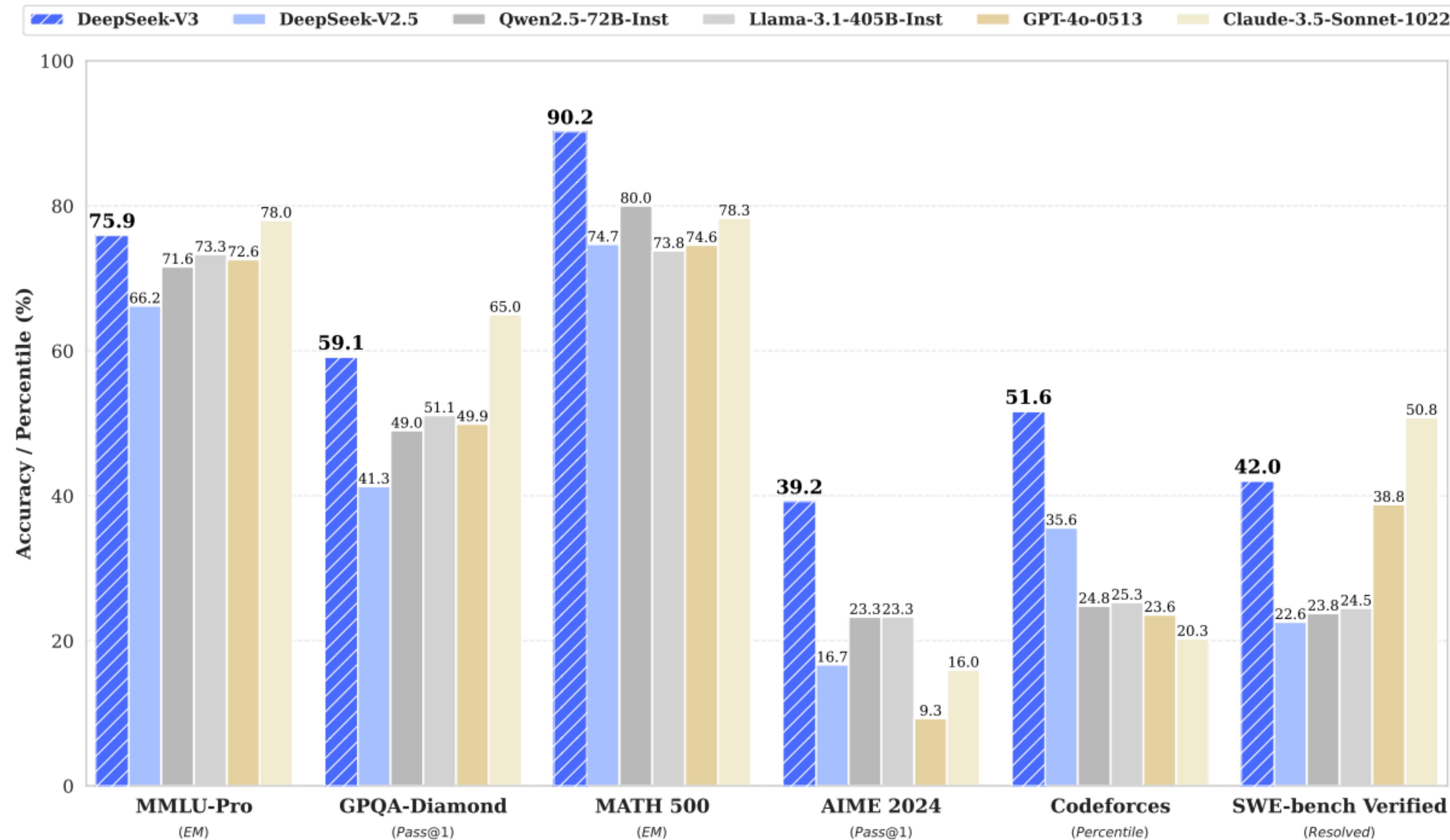


Figure 1 | Benchmark performance of DeepSeek-V3 and its counterparts.

Generating Text

A Student's Guide to Writing with ChatGPT



Text to Software

The screenshot shows a software development environment with a dark theme. At the top, there's a navigation bar with icons for home, shortly, search, and a green 'Run' button. Below the navigation bar is a tab bar with 'Webview', 'utils.py', 'app.py', 'Assistant' (which is selected), 'Agent', and a '+' icon. A sidebar on the left contains various icons for file operations like copy, paste, and search.

In the main area, there's a chat window titled 'python url shortener web app project'. A message from a user (represented by a profile picture of a man) reads:

Using Python, I'd like to build a web app that lets me administer bit.ly style short links. It should have a database for storing short links, a web server for redirecting short links to the associated destination, a home page for viewing current short links with some simple analytics, and an admin page for creating, modifying, or deleting short links.

This message was sent '1 hour ago'. Below it, the AI's response is shown:

Absolutely! Let me propose what we'll build for you.

I'll help you create a URL shortener web application using Flask. The MVP will include URL shortening, basic analytics, and an admin interface with in-memory storage. Would you like to proceed with the implementation?

- Build the initial prototype
 - Basic Email/Password Authentication
 - Bootstrap
 - (i)
- PostgreSQL database integration
- Enhanced analytics dashboard

At the bottom right of the AI's proposal, there's a green checkmark and the text 'mcodev approved the plan'.

Puzzmo Blog

6 Weeks of Claude Code

Jul 30, 2025 - Orta Therox

It is wild to think that it has been only a handful of weeks.

Claude Code has considerably changed my relationship to writing and maintaining code at scale. I still write code at the same level of quality, but I feel like I have a new freedom of expression which is hard to fully articulate.

Claude Code has decoupled myself from writing every line of code, I still consider myself fully responsible for everything I ship to Puzzmo, but the ability to instantly create a whole scene instead of going line by line, word by word is incredibly powerful.

Text to Image - Midjourney

Midjourney

What will you imagine?

Explore

Random Hot Top Day Likes

Create

Organize

Personalize New!

Chat

- General Chaos
- Prompt Craft
- Daily Theme
- Newbies

Tasks

Help

Updates

Light Mode

The image shows a grid of 12 generated images from Midjourney. The first row contains four images: a man with a beard wearing headphones, a woman with dark hair covered in colorful gemstones, Santa Claus with a white beard reading a book, and two glasses of mulled wine with orange slices and cinnamon sticks. The second row contains four images: a large, metallic-looking planet or moon in a dark space, several glowing, translucent mushrooms in a forest setting, a smiling young child playing a guitar next to a cat, and a woman in a detailed, historical-style costume with a large white wig and necklace.

Welcome



(queue to 8:40)

Text to Music

udio BETA

A submarine crew discovering an underwater civilization, orchestral, cinematic

SongoftheSpheres

Walking Alone

Prompt: soul blues, soul/pop, soul and r&b, soul music, soulful, hip hop rap, hip hop, r&b/soul/pop, r&b/rap, alternative r&b, bittersweet, sentimental, uplift

male vocalist hip hop pop rap passionate boastful introspective bitter
pop melodic sentimental r&b rap melancholic love uplifting son

Create Share

Attribution

Gamahea = Udio.com/creators/songofthespheres | <https://GamaheaMusic.com>

Description

Just a little self-burn here, it was needed. Shame it cost SO MANY credits to make. Enjoy.

110 Credits

Video Summarization - Gemini

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

Audio Summarization - NotebookLM

Deepseek V3

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

Share

Settings

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

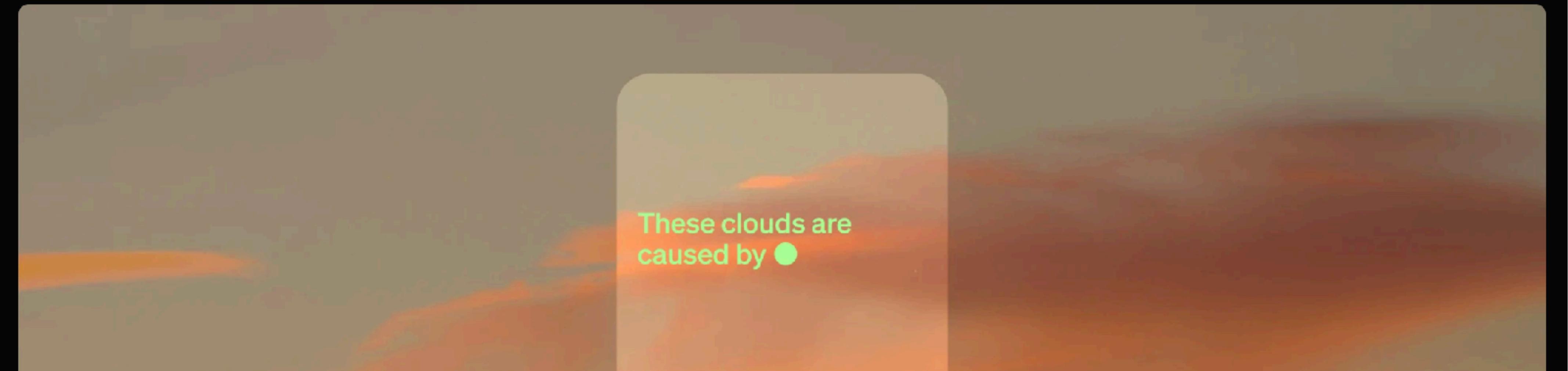
Saved notes will appear here
Save a chat message to create a new note, or click Add note above.

NotebookLM can be inaccurate; please double check its responses.

Speech to Speech

September 25, 2023

ChatGPT can now see, hear, and speak

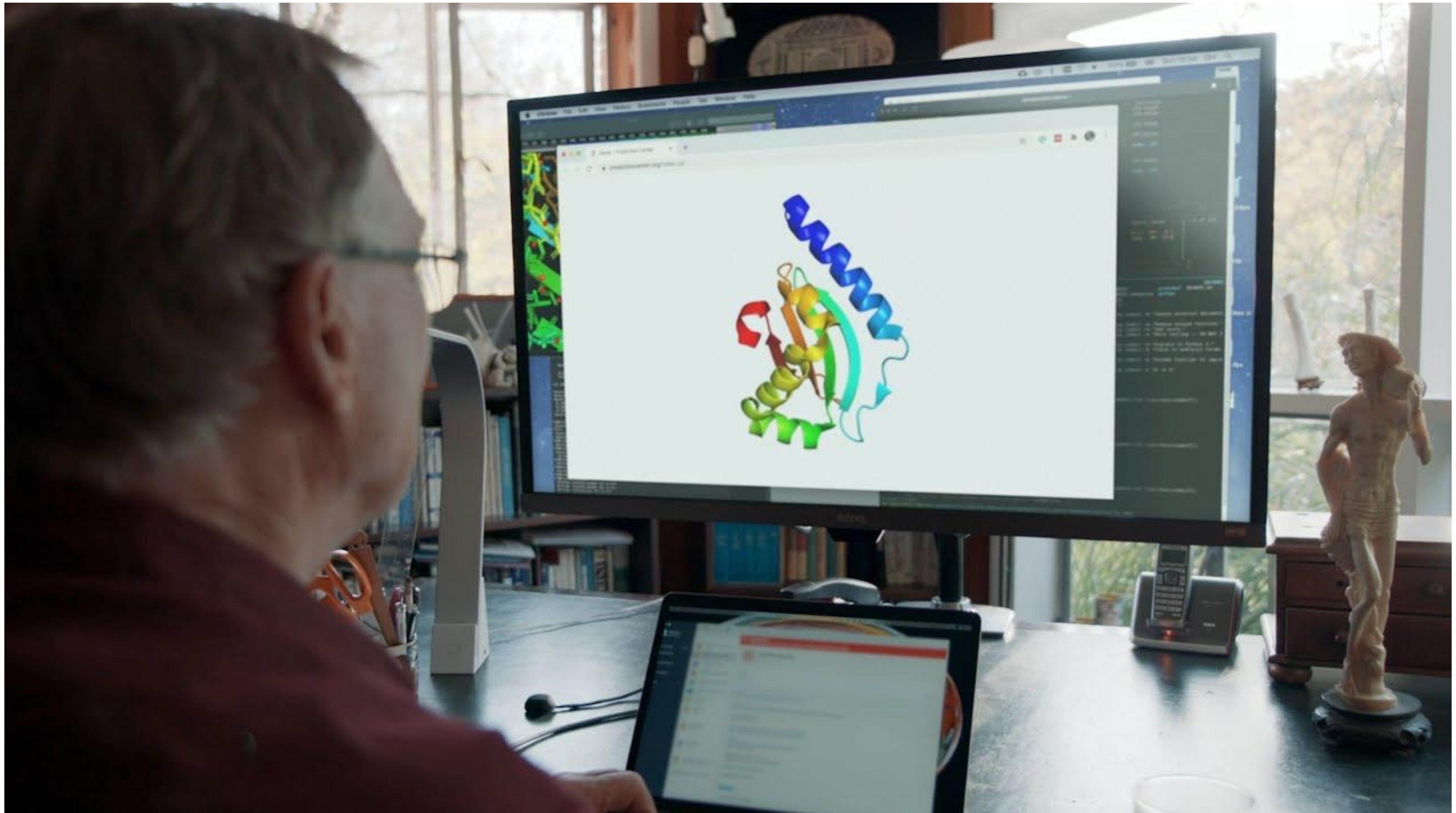


AlphaGo



0:00 - 2:00

AlphaFold



AlphaFold is Open Source

github.com/google-deepmind/alphafold



Social Sciences - Article

AI Tutoring Outperforms Active Learning

Gregory Kestin*, Kelly Miller*, Anna Klales, Timothy Milbourne, and 1 more

This is a preprint; it has not been peer reviewed by a journal.

<https://doi.org/10.21203/rs.3.rs-4243877/v1>

This work is licensed under a CC BY 4.0 License

Education

Abstract

Advances in generative artificial intelligence (GAI) show great potential for improving education. Yet little is known about how this new technology should be used and how effective it can be. Here we report a randomized, controlled study measuring college students' learning and their perceptions when content is presented through an AI-powered tutor compared with an active learning class.

The AI tutor was developed with the same pedagogical best practices as the lectures. We find that students learn more than twice as much in less time when using an AI tutor, compared with the active learning class. They also feel more engaged and more motivated. These findings offer empirical evidence for the efficacy of a widely accessible AI-powered pedagogy in significantly enhancing learning outcomes, presenting a compelling case for its broad adoption in learning environments.

Khanmigo



Medicine

- Improved disease screening
- Enhanced diagnostic imaging
- Drug discovery and development
- Medical document transcription
- Predictive modeling

CHIEF achieved nearly 94 percent accuracy in cancer detection and significantly outperformed current AI approaches across 15 datasets containing 11 cancer types.

A.I. Chatbots Defeated Doctors at Diagnosing Illness

A small study found ChatGPT outdid human physicians when assessing medical case histories, even when those doctors were using a chatbot.

Ethics

Using AI Safely



**Discussion topic:
What are some of your concerns about AI?**

Here's my short list...

- **Privacy**
- **Bias**
- **Misinformation**
- **Military**
- **Employment**
- **Environment**
- **Copyright**
- **Society**

Privacy

- “**If you’re not paying for it, you’re the product**”.
- **Your AI interactions are being used just like your web searches.**
- **How many times have you read the terms & conditions?**
- **Facial recognition is widely used in the UK without your consent.**
- **Legislators and companies are working on regulation but progress is much slower than technological advances.**
- **New privacy threats are emerging every day.**
- **IMO, companies cannot be trusted to self-govern.**

Privacy





Bias

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

Misinformation

- **It's easier than ever to lie.**
- **Deepfakes are a particularly alarming development.**
- **This poses serious threats to democracy and is increasingly being weaponized.**
- **Education is critically important.**
- **Can we use AI to counter these threats?**
- **Example: fullfact.org**
- **Why are efforts like Full Fact so underfunded?**

Military

- **AI is being used to process battlefield data, target individuals, and make real time decisions.**
- **AI is beginning to be used in autonomous weapons.**
- **Companies cannot be trusted to self-govern.**
- **Example: Google's Project Nimbus**
- **Somehow doesn't contradict Google's AI Principles**

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.**
- **Knowing how to leverage AI will be one of those opportunities.**
- **Example: software engineers => systems engineers**
- **People will be 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

The Anthropic Economic Index

Feb 10, 2025 • 9 min read

[Read the paper](#)

Generative AI at Work*

Erik Brynjolfsson
Stanford & NBER

Danielle Li
MIT & NBER

Lindsey Raymond
MIT

April 25, 2023

Please see [here](#) for latest version

Abstract

We study the staggered introduction of a generative AI-based conversational assistant using data from 5,179 customer support agents. Access to the tool increases productivity, as measured by issues resolved per hour, by 14 percent on average, with the greatest impact on novice and low-skilled workers, and minimal impact on experienced and highly skilled workers. We provide suggestive evidence that the AI model disseminates the potentially tacit knowledge of more able workers and helps newer workers move down the experience curve. In addition, we show that AI assistance improves customer sentiment, reduces requests for managerial intervention, and improves employee retention.

Should You Still Learn to Code in an A.I. World?

Coding boot camps once looked like the golden ticket to an economically secure future. But as that promise fades, what should you do? Keep learning, until further notice.



Listen to this article · 12:01 min [Learn more](#)



Share full article



Programmers are modern-day computers

February 3, 2025 • 2 min read



Programming as we know it is in a process of dying out.

Most haven't come to terms with it yet.

I was inspired to write this after reading an article titled [AI is Creating a Generation of Illiterate Programmers](#), which claimed AI is making developers worse at their craft.

Yes, some of your programming skills will deteriorate due to AI.

It doesn't matter.

Those are the very skills that are going to become a lot less relevant, for the precise reason that, now, the machine can do those things.

Department of Data

1 in 4 programming jobs have vanished. What happened?

A big jump in unemployment for programmers since 2022 may be the first sign that artificial intelligence is taking human jobs.

Today at 6:00 a.m. EDT

9 min    30

Environment

- Carbon footprint of training one deep learning model same as the lifetime emission of 5 cars.
- Computation required to train the most advanced AI models doubles every 3.4 months.
- Globally, AI-related infrastructure consumes six times more water than Denmark.
- Chips that power AI require rare earth elements, mined in environmentally destructive ways.

The Washington Post logo: Democracy Dies in Darkness

Business Economy Economic Policy Personal Finance Work Technology Business of Climate

Amazon doubles down on nuclear energy with deal for small reactors

The cloud computing and retail giant signed a deal to buy electricity generated by small modular nuclear reactors.

3 min 315

The 19th-Century Technology That Threatens A.I.

Dec. 28, 2024



Illustration by Kristie Bailey/The New York Times. Photographs by Getty Images.

Copyright

- **How will it work in the AI era?**
- **AI companies are getting a free ride.**
- **Did you get your ChatGPT royalty check for your blog articles?**
- **My opinion: 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.



404

SIGN IN

SUBSCRIBE

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.

Society

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.



The Future

Where is all this going?



Photo by [Mathilda Khoo](#) on [Unsplash](#)

Benchmarking Intelligence

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

Benchmarking Results (2025)

- **Math:** IMO gold-level performance
- **STEM Q&A:** ~86–88% top scores (Grok 4, GPT-5)
- **Coding:** mid-60% issues resolved at the top
- **Agents:** 63–65% for top setups
- **Human preference:** multiple front-runners

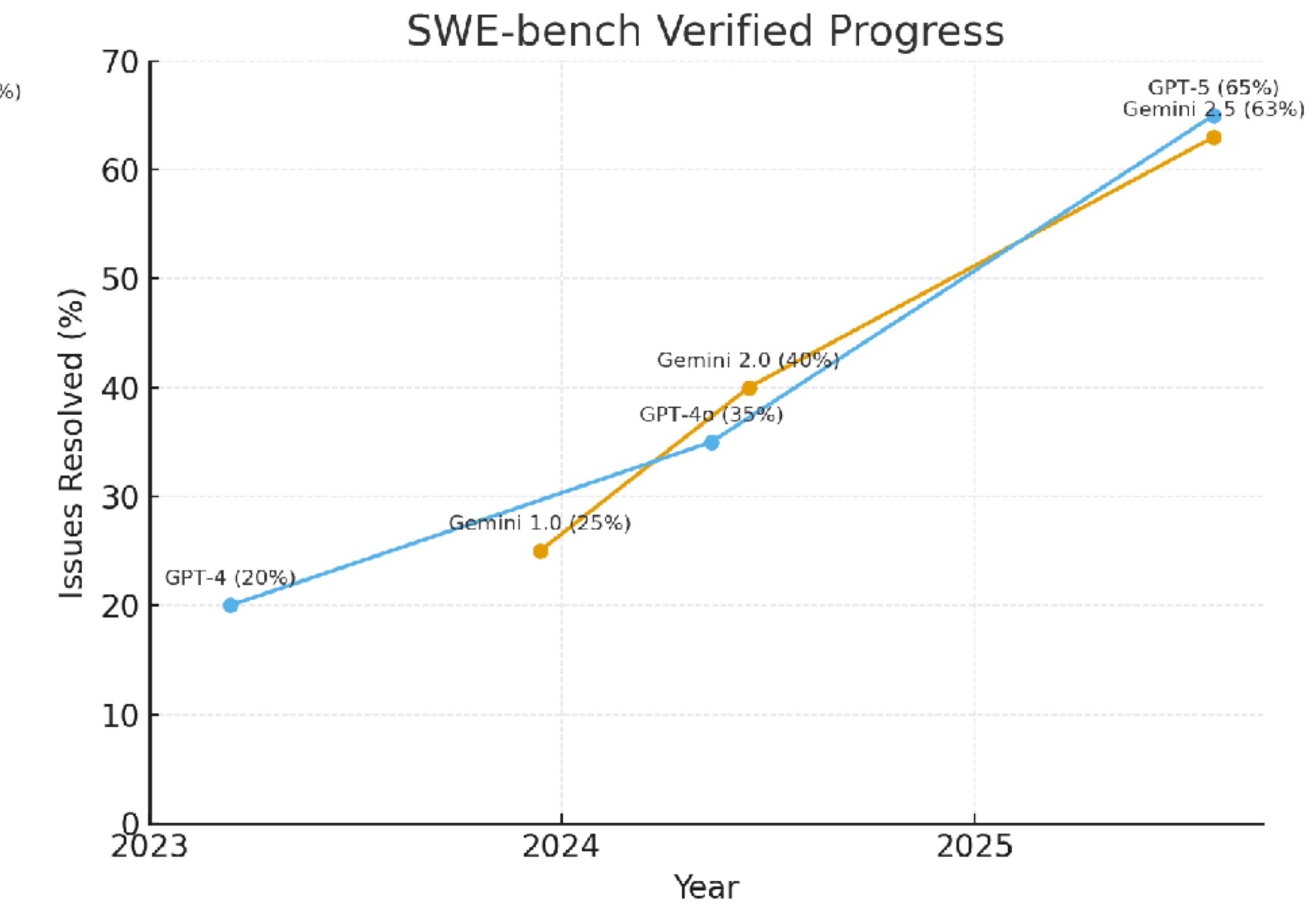
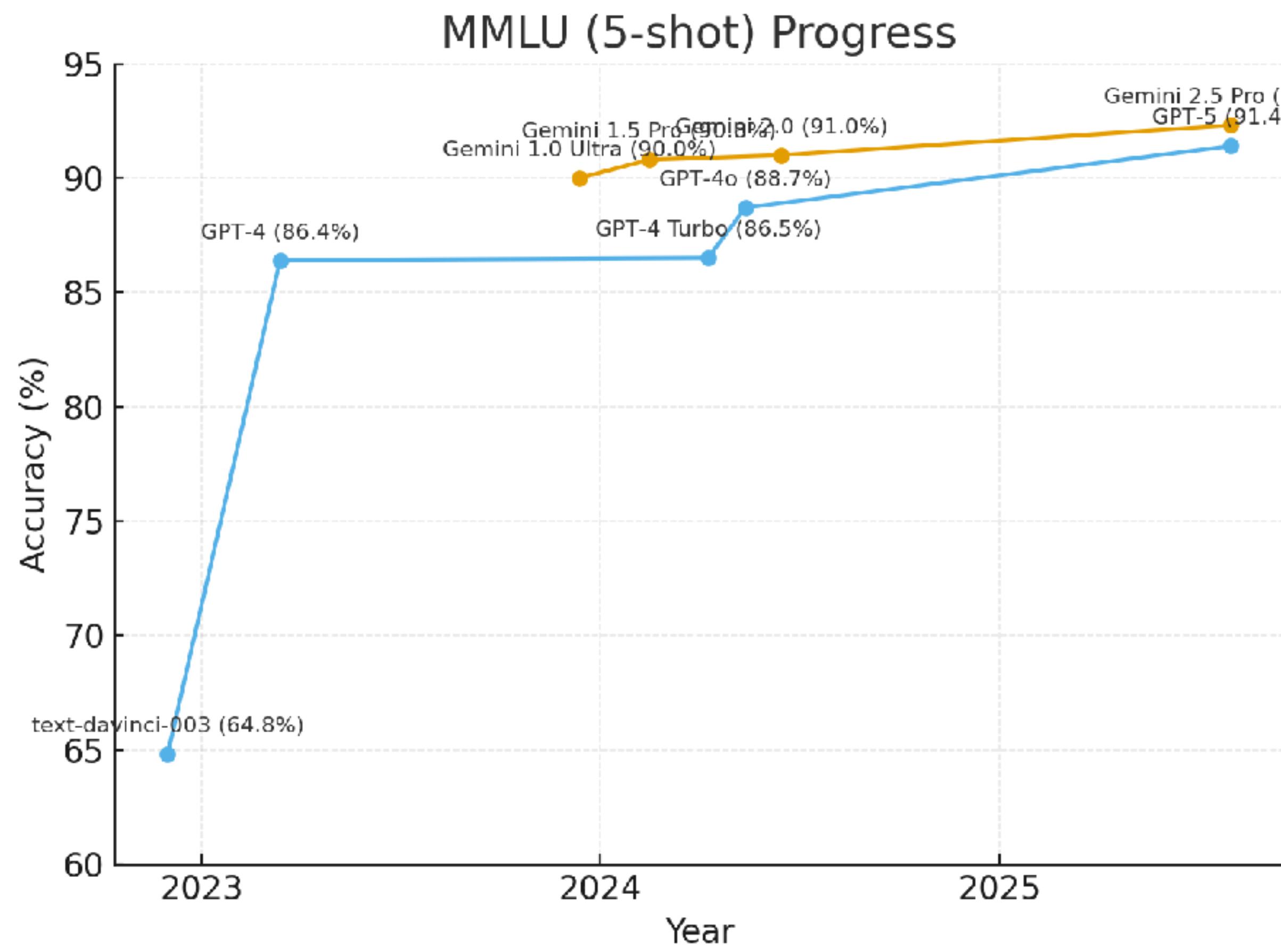
What's improving/lagging?

- Math/logic and code: steep gains
- Open-ended, multi-tool tasks: improving but brittle
- Multimodal academic exams: capable, still sensitive to prompts

Benchmarks

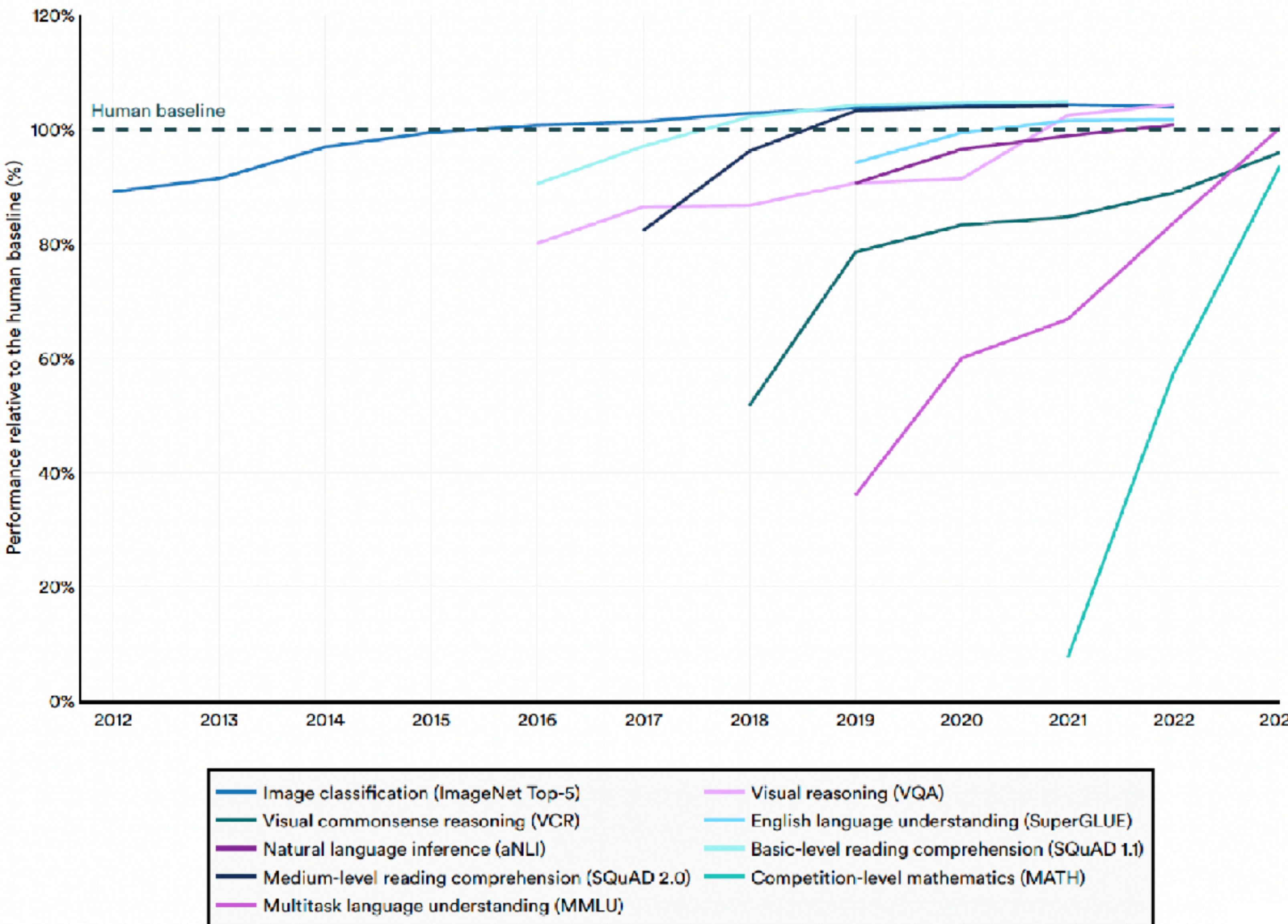
- [Chatbot Arena](#)
- [GPQA](#)
- [SWE-bench](#)
- [GAIA](#)
- [MMMU](#)

OpenAI vs Gemini: Knowledge vs Coding Benchmarks (2022→2025)



—●— Gemini —●— OpenAI

Select AI Index Technical Performance Benchmarks vs. Human Performance



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.**
- **If you could talk to God, what would you ask?**

Four Questions

- 1. Are language models intelligent?**
- 2. Can humans be trusted with this tool?**
- 3. Is AI a net good for society?**
- 4. Are we doomed?**

My Answers

1. Are language models intelligent?

- Are we 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.
- Nothing new about humans using tools for bad purposes.
- 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?

- Probably.

Geoffrey Hinton



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

- Geoff Hinton

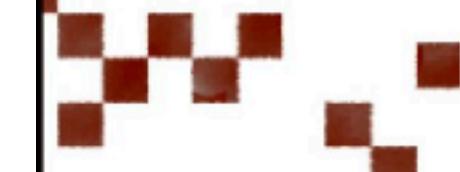
If some day we build machine brains that surpass human brains in general intelligence, then this new superintelligence could become very powerful. And, as the fate of the gorillas now depends more on us humans than on the gorillas themselves, so the fate of our species would depend on the actions of the machine superintelligence.



NICK BOSTROM

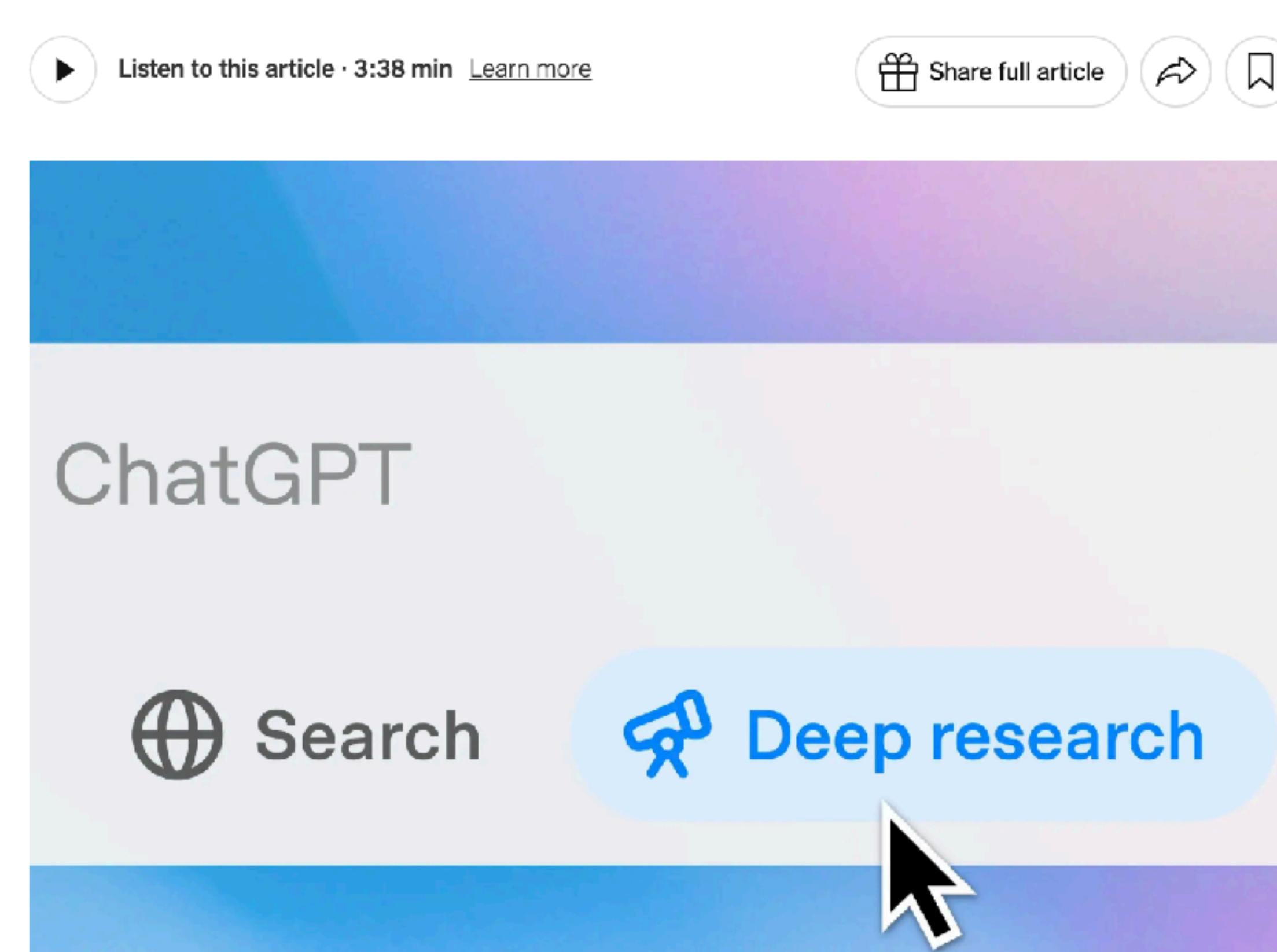
SUPERINTELLIGENCE

Paths, Dangers, Strategies



OpenAI Unveils A.I. Tool That Can Do Research Online

The tool, called Deep Research, arrives days after OpenAI released another one, which shops for groceries and books restaurant reservations.



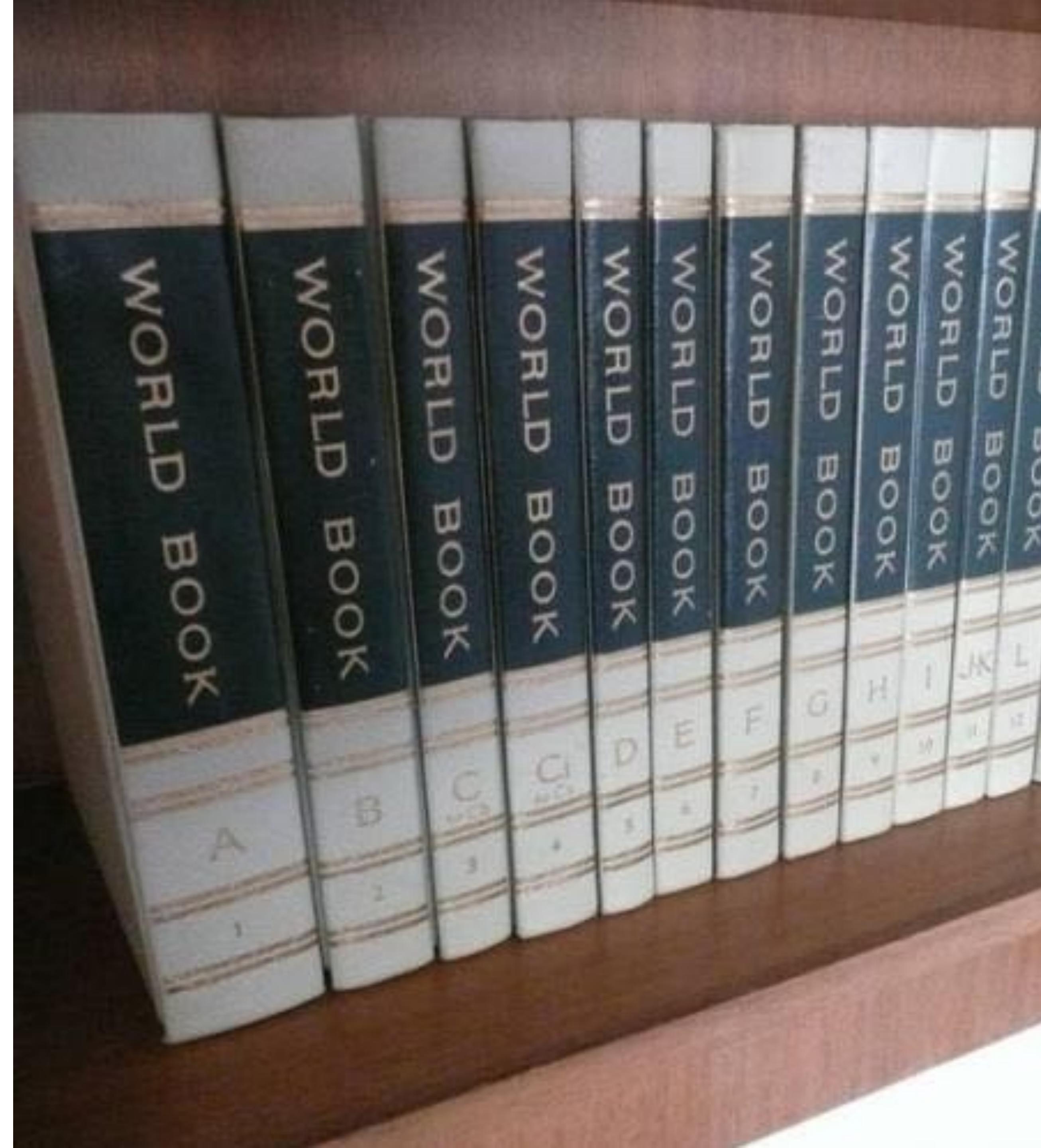
Navigating Change

- advanced programming languages
- portable operating systems
- Moore's Law
- PC proliferation
- the internet
- the web
- smart phones
- the cloud
- data science boom
- ML & AI

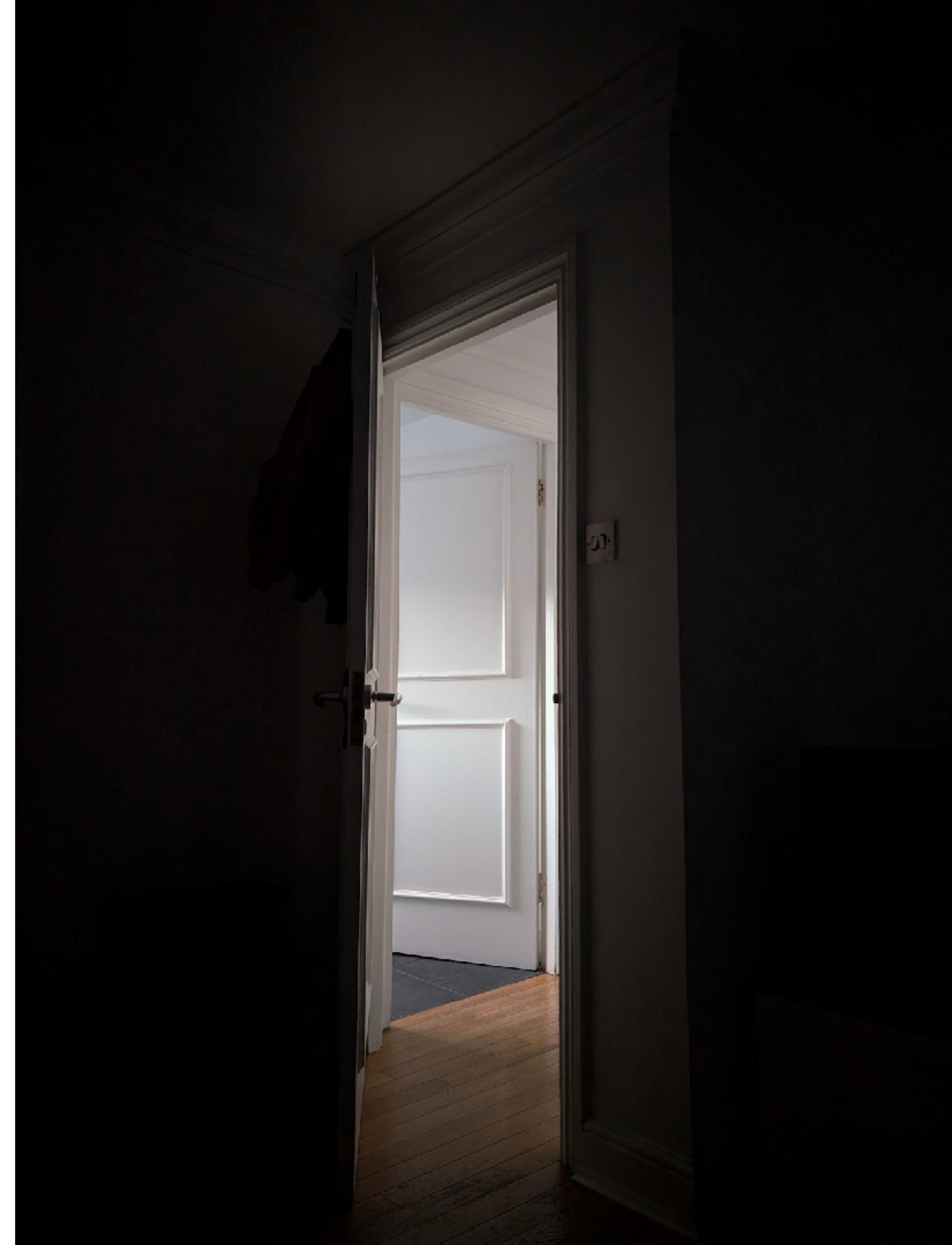
A close-up photograph of a black dog's face, looking slightly upwards and to the left. The dog has dark eyes and a visible nose. In the upper left corner, a person's arm and hand are partially visible, wearing a light-colored sleeve and holding a small, colorful object with blue, red, and yellow edges. The background is a plain, light-colored wall.

Ok, but how?

Stay curious

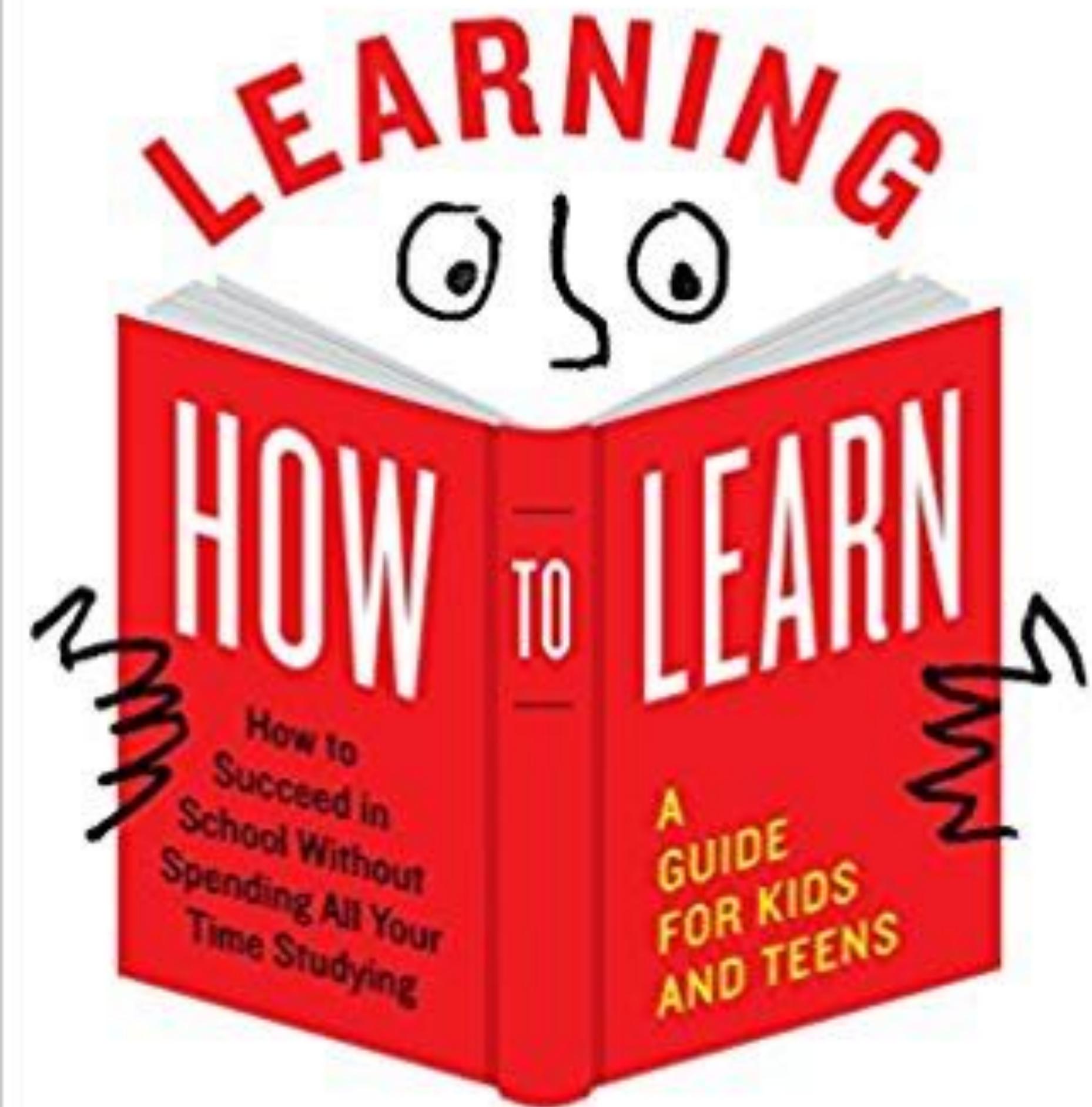


Be open to opportunity



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 (make plans)



Photo by [Glenn Carstens-Peters](#) on [Unsplash](#)

Slides

mco.dev/introAI.pdf

This is for everyone

