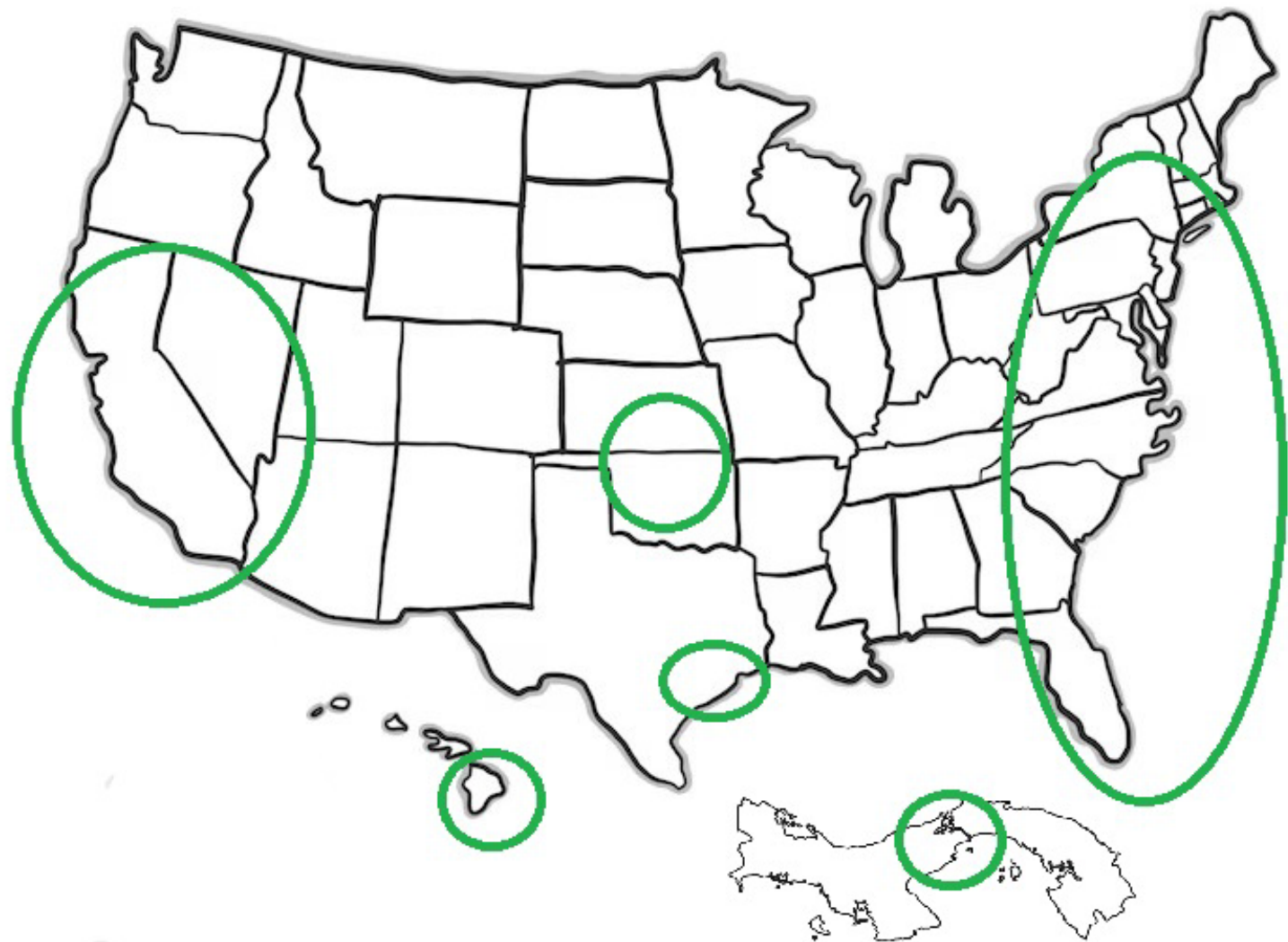


The background of the slide is white with abstract, colorful splatters and geometric shapes. In the top right corner, there is a large, textured blue and purple splatter. In the bottom left corner, there is a large, textured purple and blue splatter. Scattered throughout the slide are smaller, semi-transparent geometric shapes, including hexagons and circles, in shades of purple, blue, and pink.

# Artificial Intelligence for Dinosaurs

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United States of America



# What you'll learn today...

- Practical applications of AI
- Types and Levels of AI
- How AI “learns” and “thinks”
- How image generation works
- How large language models work

‘AI is just fancy  
auto-complete’

## **Healthcare**

accelerating drug discovery

## **Customer Service**

AI-powered virtual assistants and chatbots

## **Finance**

fraud detection, algorithmic trading

## **Manufacturing**

supply chain optimization and robotics

## **Transportation**

self-driving cars and trucks, intelligent traffic management systems

## **Education**

adaptive learning tailors educational content, plagiarism detection

## **Energy**

smart grid management, demand forecasting

## **Human Resources**

resume screening and workforce planning

## **Environment**

wildlife conservation and natural disaster prediction

## **Security**

biometric authentication systems like fingerprint, iris and voice recognition

## **Entertainment**

AI-powered recommendation systems, virtual reality (VR)

## **Law and Legal Services**

process large volumes of legal documents, identify potential issues in contracts



Think like a human



Think rationally



Act like a human



Act rationally

## Programming

- Deals with known scenarios
- Clear technical requirements
- The behavior of the system is:
  - \*Predetermined
  - \*Implemented directly

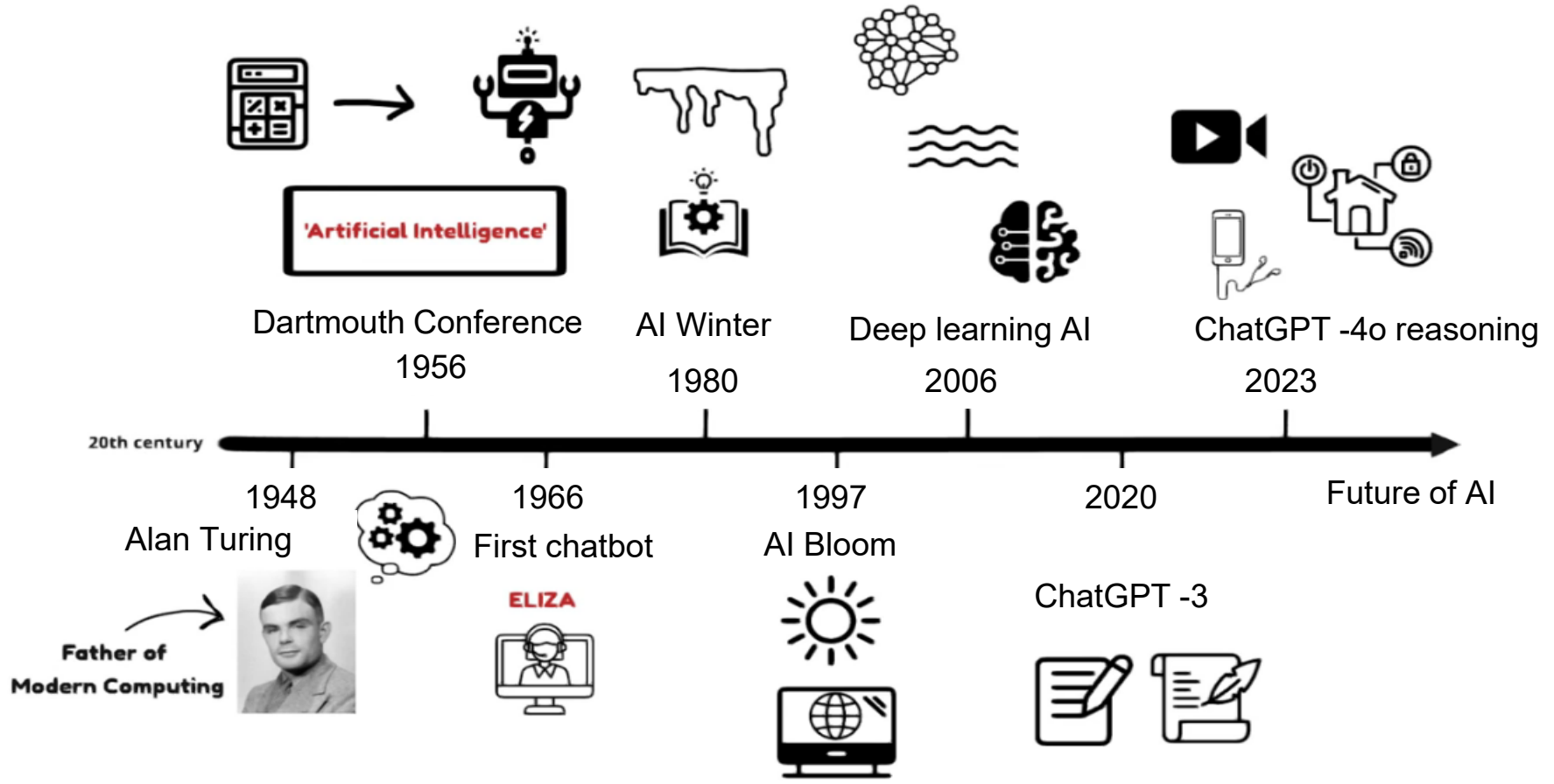
**Deterministic**

## AI development

- Deals with behavior under uncertainty
- Is developed for a certain use case
- The behavior of the system:
  - \*Relies on incoming data
  - \*Is chosen by an optimized algorithm/tool

**Probabilistic**

# AI Development Timeline

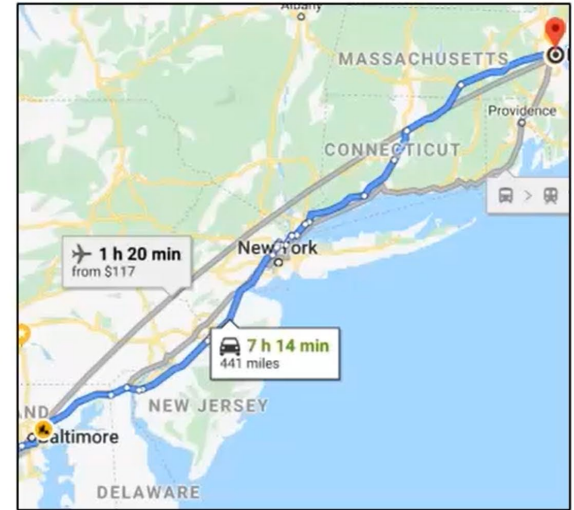
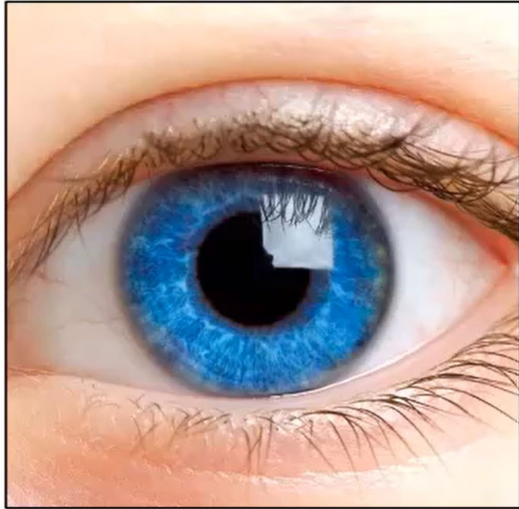




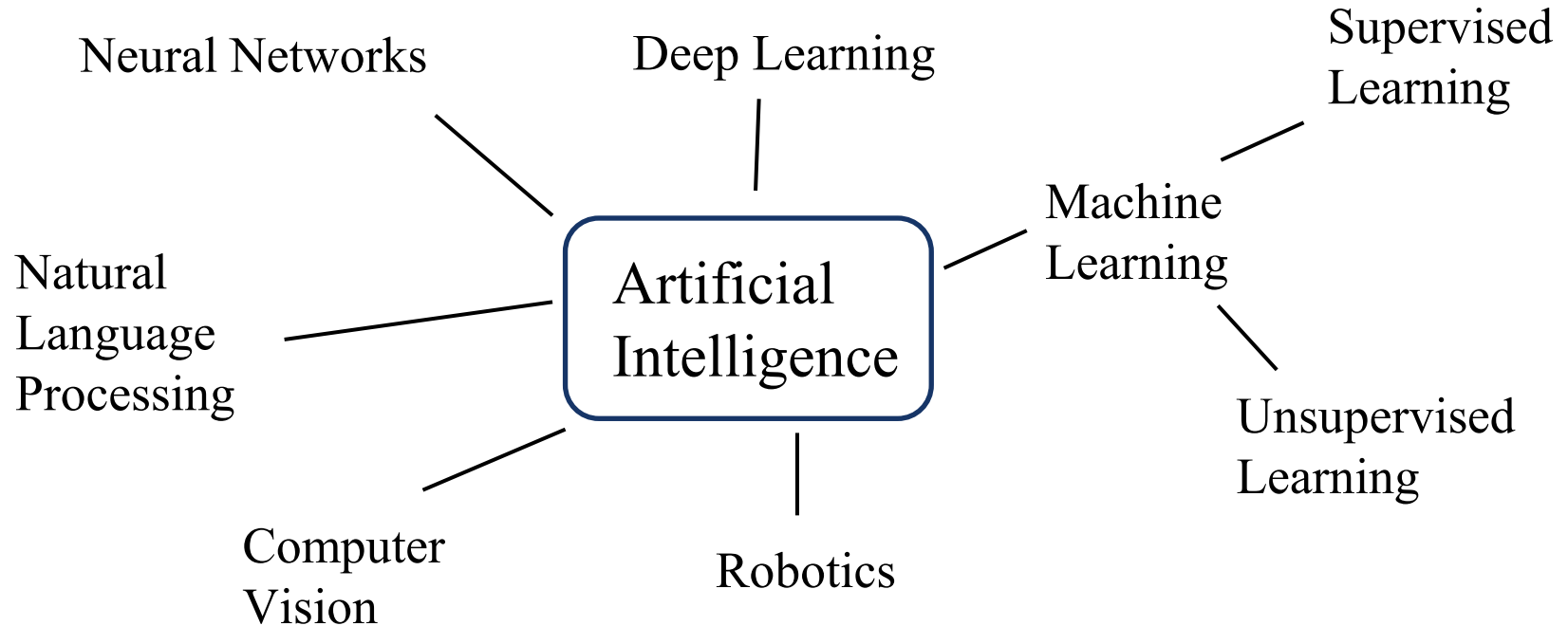
# AI can be general or narrow



Typical “narrow” tasks include vision, language processing, and route planning.



# 6 Main Fields of Artificial Intelligence



## **The field of study**

### **Machine Learning**

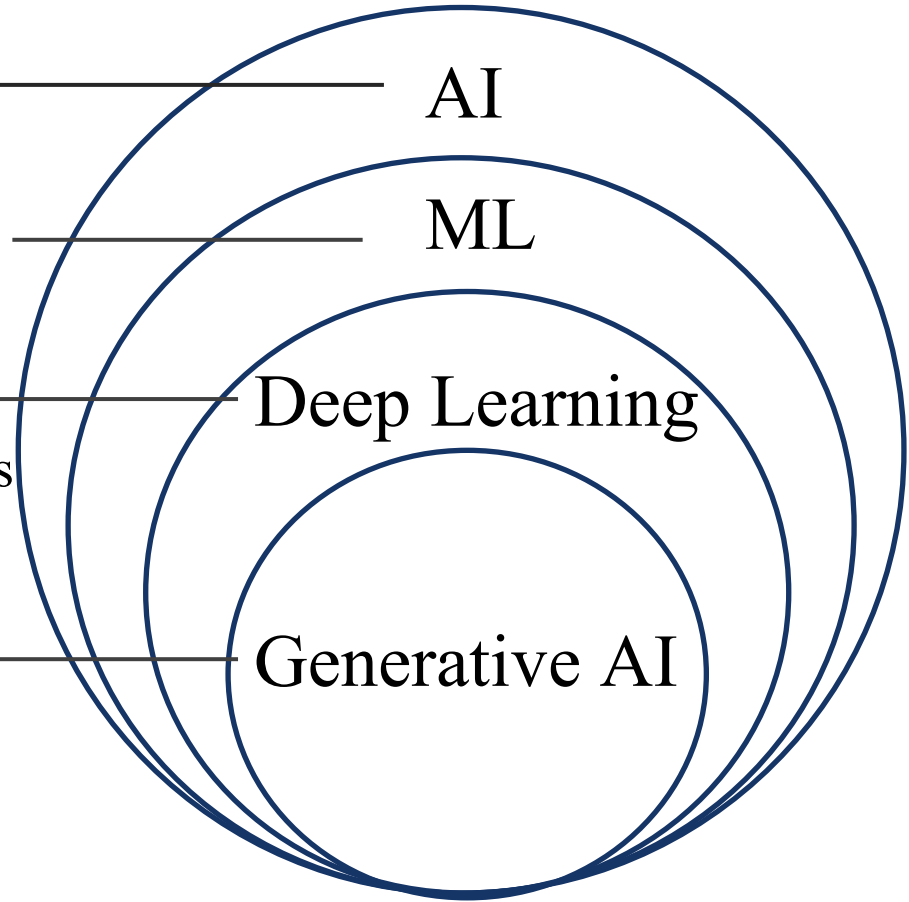
Focuses on the creation of intelligent machines that learn from data

### **Deep Learning**

A subset of Machine Learning methods based on Artificial Neural Networks

### **Generative AI (GenAI)**

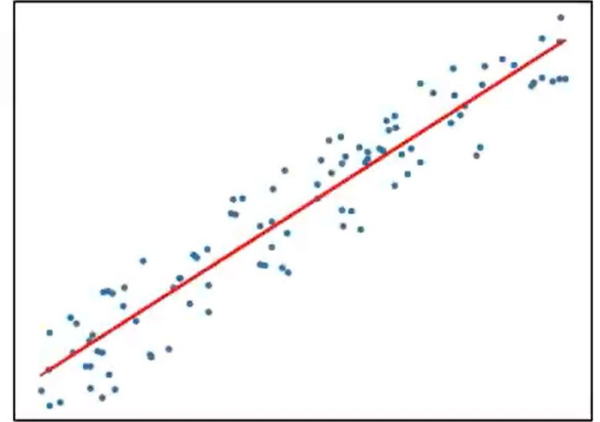
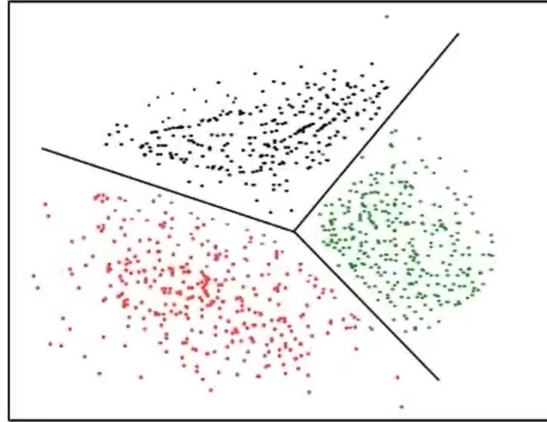
A type of Artificial Neural Network that generates data that is similar to the data it was trained on - for example, a LLM (ChatGPT)



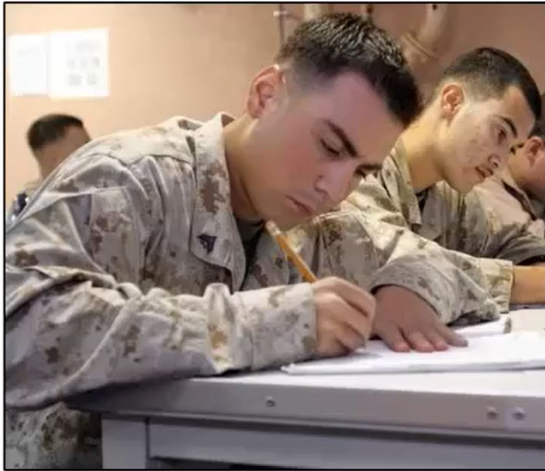
Machine learning can perform many tasks, including classification, clustering, and regression.



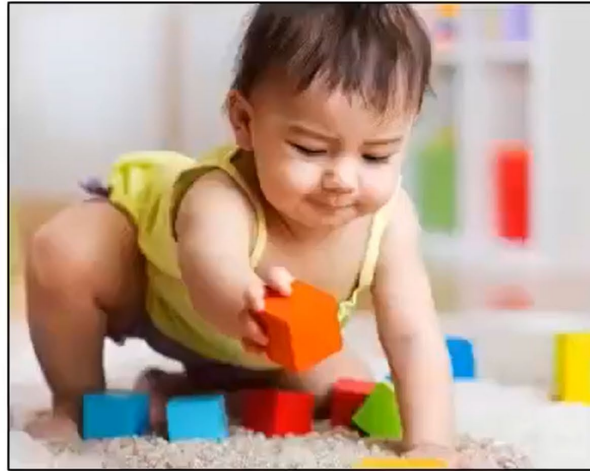
CAT



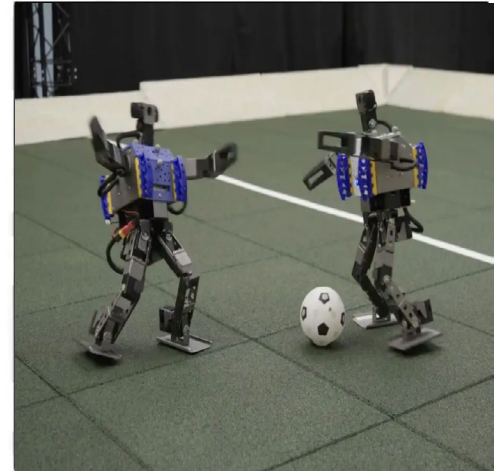
There are three general types of computer learning: supervised, unsupervised, and reinforcement.



Learn from labeled examples



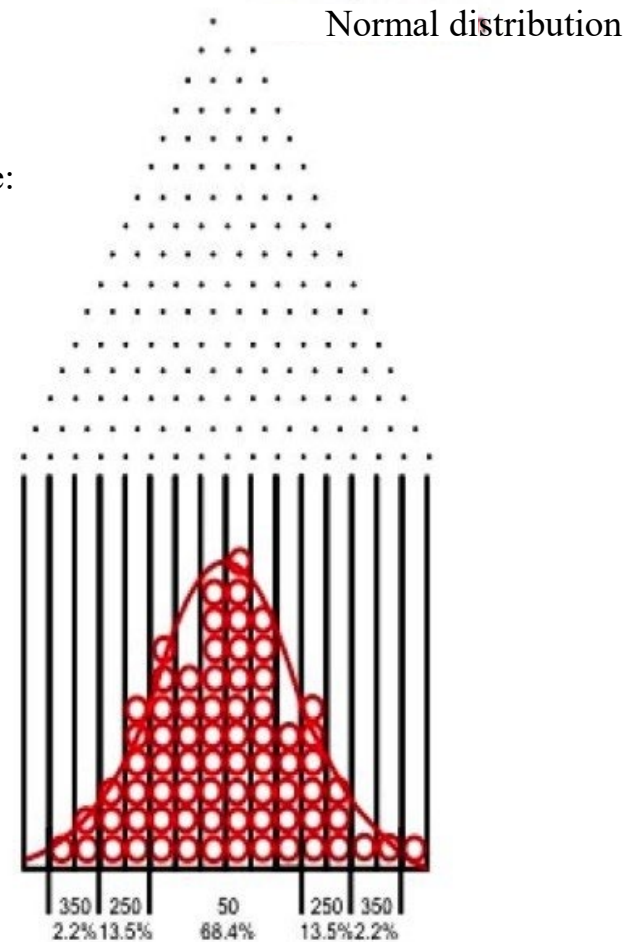
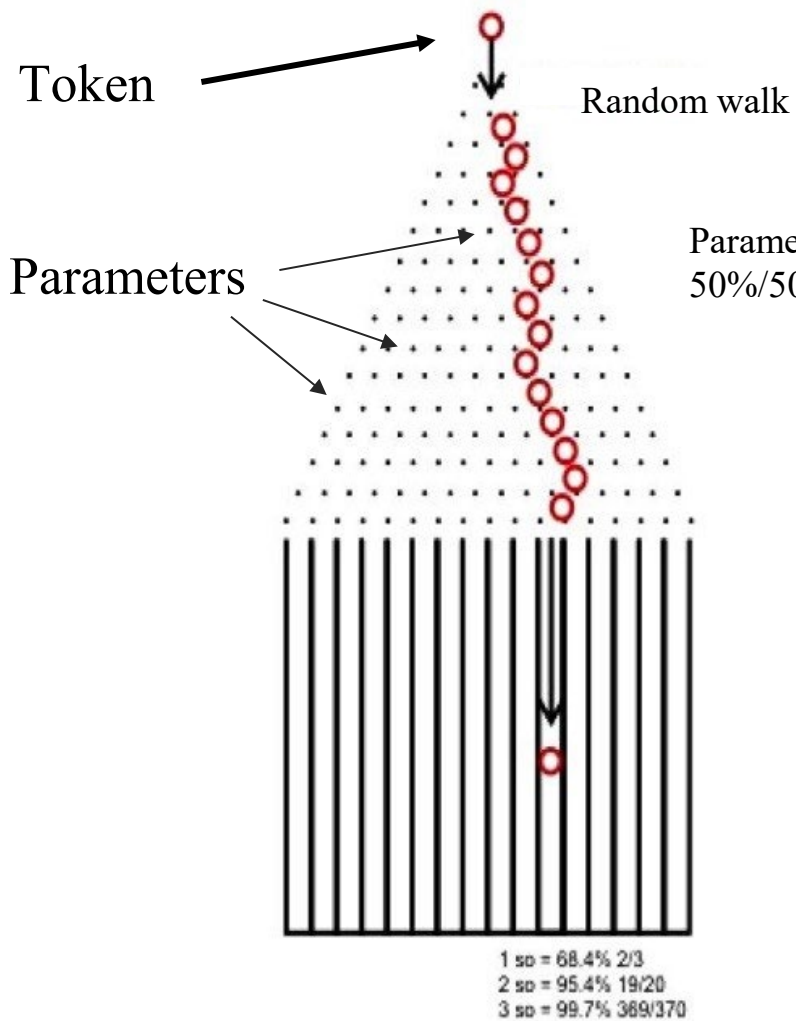
Discover hidden patterns



Reward-based decision-making









## Plinko:

**144 pegs, ~65,000 possible paths**

## Stable Diffusion:

**860,000,000 parameters (image generation)**

## GPT-4 (Generative Pre-Trained Transformer):

**1,700,000,000,000 parameters (large language model)**

A long-exposure photograph of the night sky, showing the Milky Way galaxy in a diagonal orientation. The galaxy's core is a bright, glowing band of light with a mix of orange, yellow, and white hues, surrounded by darker, dusty regions. The rest of the sky is a deep, dark blue, densely populated with numerous small, white stars. At the bottom of the image, the dark, jagged silhouette of a mountain range is visible against the horizon.

**Every Star,  
Connected to Every Other Star**

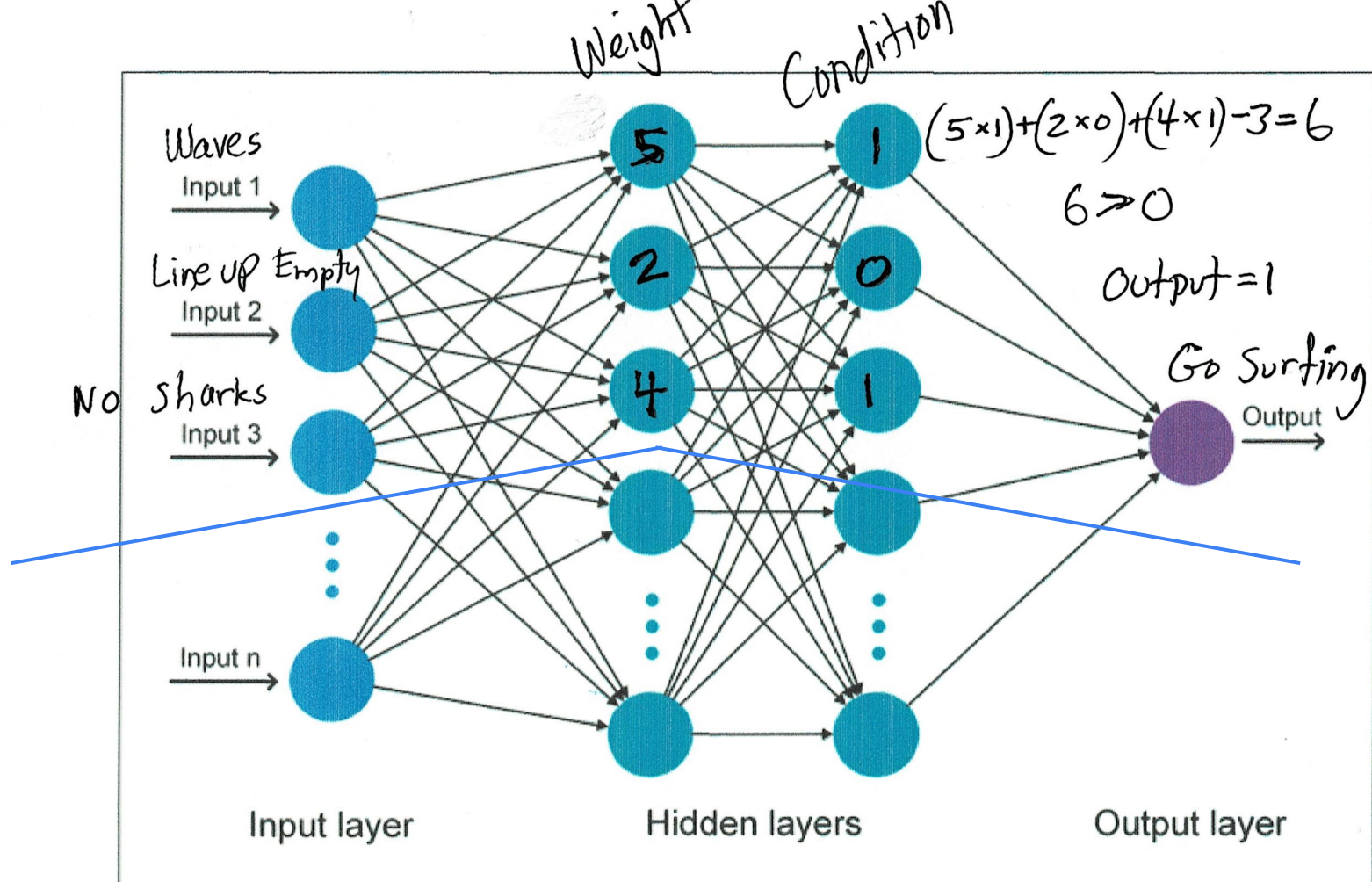
# How do LLMs learn?

## Neural Network - Definition

An AI neural network works like a tiny version of a human brain. It has connected "neurons" that pass information through layers. Each neuron does a little math and sends the result to the next layer, helping the AI learn patterns and make guesses based on the information it gets.

The network takes in data, learns by adjusting the connections between neurons during training, and tries to get better at giving the right answers. In the end, it uses what it learned to figure out the best result for new information.





How do computers  
connect all those  
dots?



# NVIDIA Corp

\$128.99

↑2,082.57%

+123.08 5Y

Pre-market: \$127.99 (↓0.78%) -1.00

Closed: Jan 29, 7:11:47 AM UTC-5 · USD · NASDAQ · Disclaimer

1D

5D

1M

6M

YTD

1Y

5Y

MAX



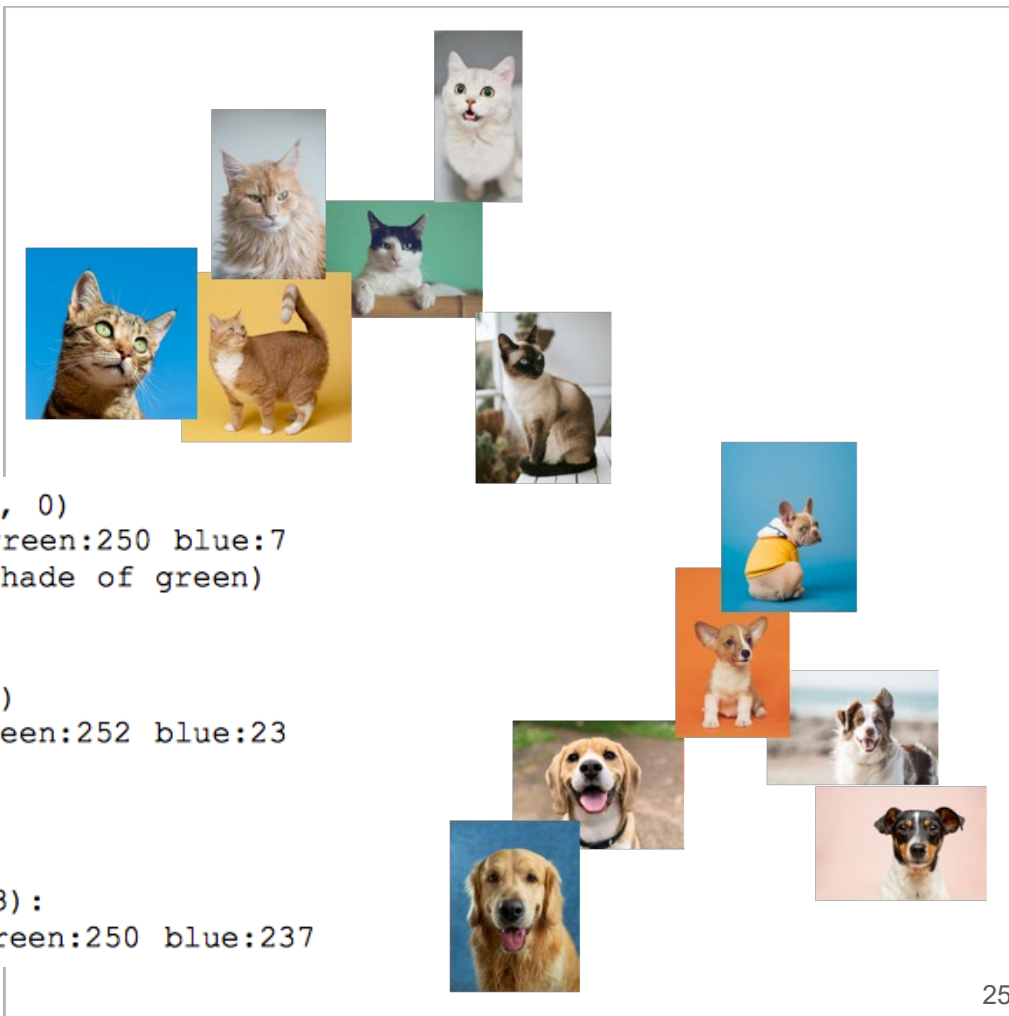
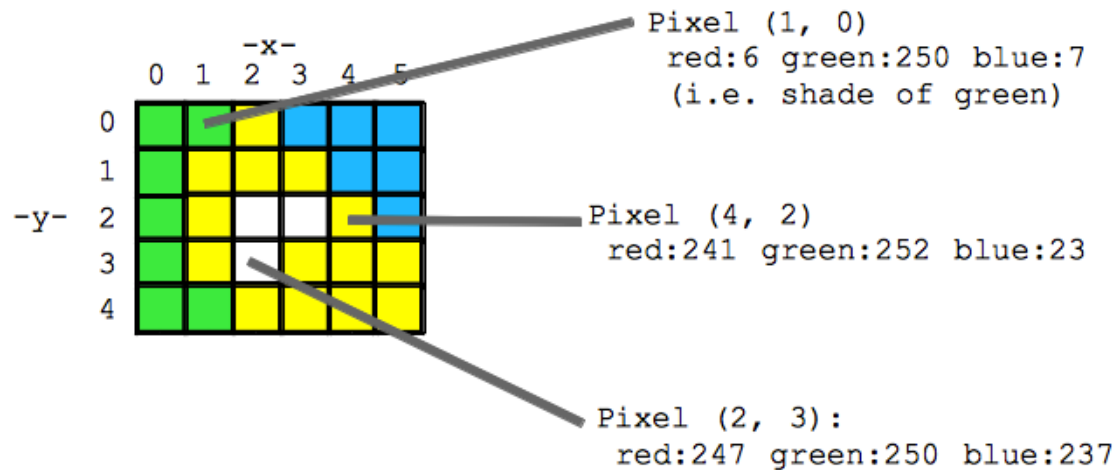


# How Image Recognition Works



# What's in a photo?

- Pixels (2D grid)
- Colors



**Dog**



**Cat**



Training Image Recognition AI requires you to feed it a “right” answer...

But language AI can eventually ‘learn’ from existing written content.

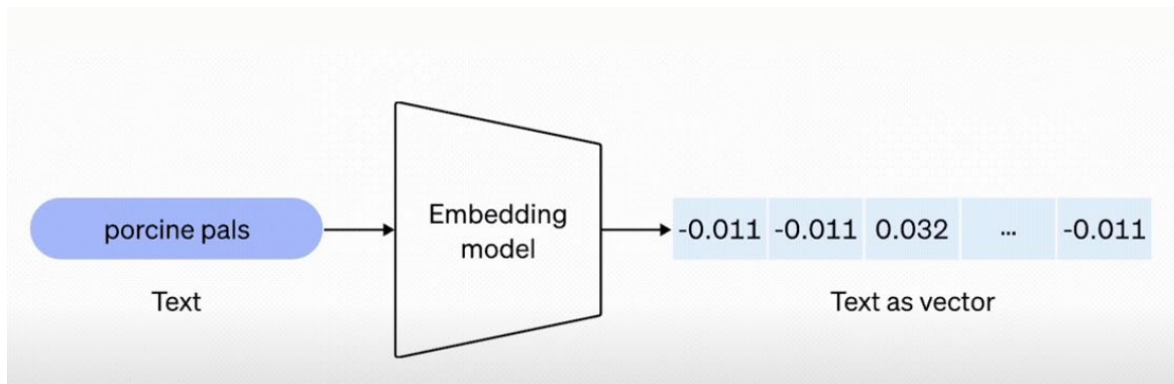
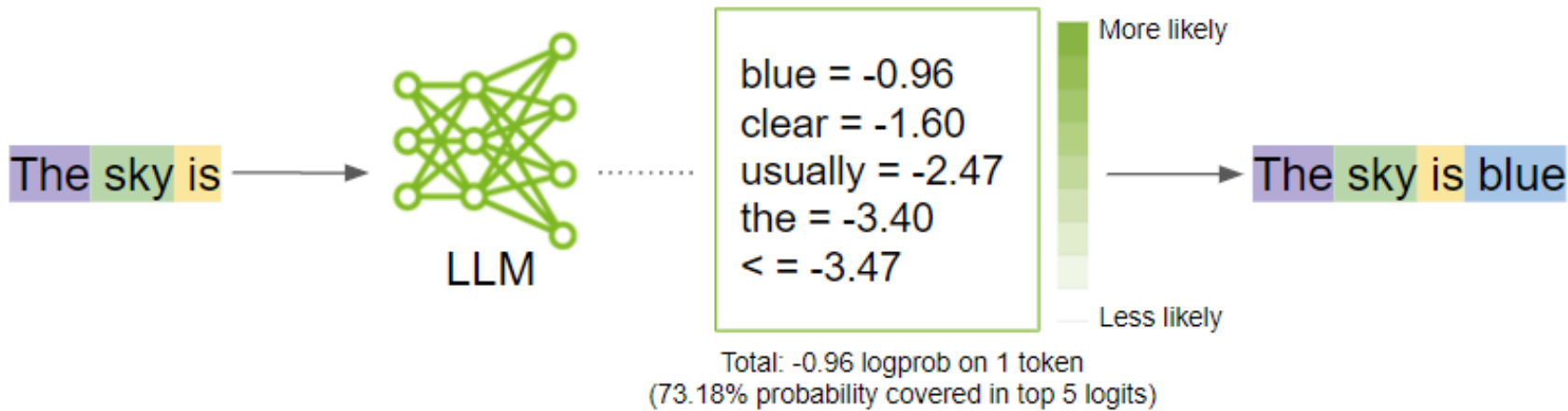
# How GPT and Large Language Models Work

Pre-train on a large corpus of text.

Fine-tune the model on specific tasks by training it on a smaller dataset related to that task.

LLM training is primarily done through unsupervised, semi-supervised, or self-supervised learning.

# Parameters and Tokens Example



# Parameters and Probabilities in the Large Language Model

I am very bored, could you suggest some things for me to do?

1. Read a new book or novel that interests you.
2. Take up a new hobby or learn a new skill, such as painting, cooking, or playing an instrument.
3. Go for a walk or run outside and explore your neighborhood.
4. Watch a classic movie or binge-watch a new TV series.
5. Start a journal or write down your thoughts and feelings.
6. Do a puzzle or play a board game with friends or family.
7. Listen to a new type of music or create a playlist of your favorite songs.
8. Declutter and organize your living space.
9. Try a new workout or yoga routine.
10. Volunteer at a local charity or organization.
11. Plan a day trip or weekend getaway to a nearby city or town.
12. Go on a virtual tour of a museum or art gallery.
13. Create a vision board or set new goals for yourself.
14. Browse online for fun and interesting DIY projects to try.
15. Have a video chat with friends or family.

painting = 83.62%

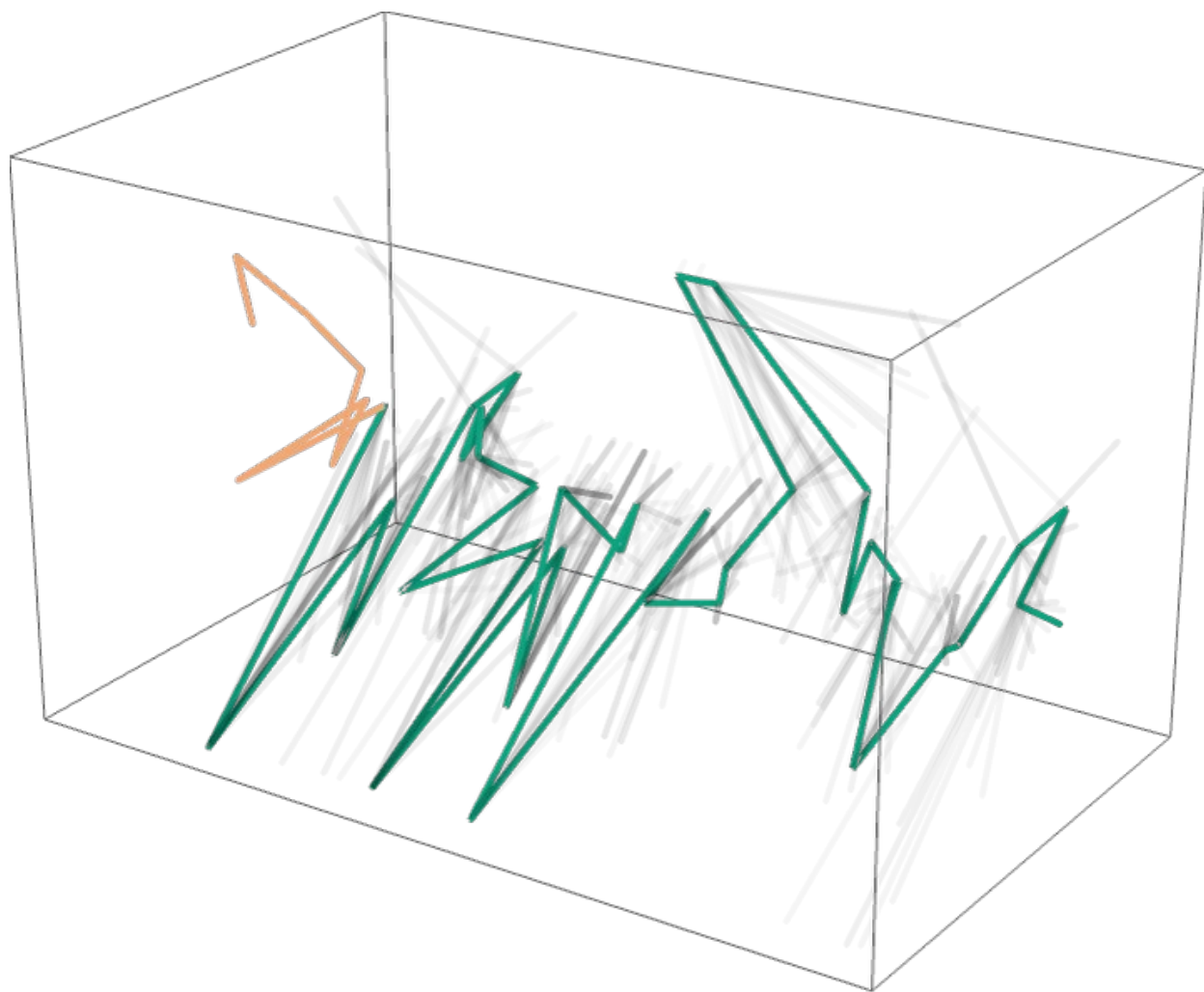
knitting = 7.55%

cooking = 4.60%

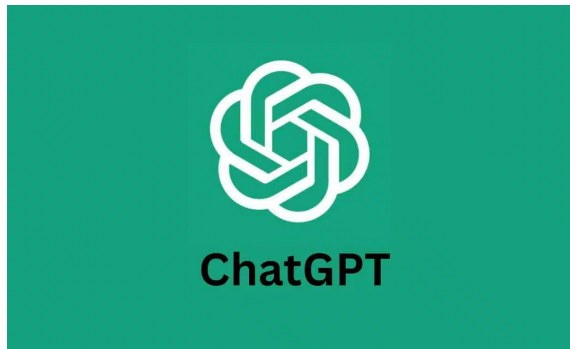
drawing = 2.44%

playing = 0.64%

Total: -0.18 logprob on 1 tokens  
(98.86% probability covered in top 5 logits)







Content creation.  
Product description, trip itinerary, speech.



Text to image creation.

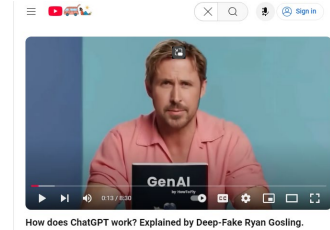
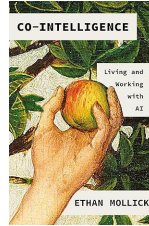


Text to image creation.  
Website photos, logos.



Text to video creation.  
Explainer video.

# Further reading...



[Co-Intelligence: Living and Working with AI-Ethan Mollick](#)

[Irreplaceable: The Art of Standing Out in the Age of Artificial Intelligence-Pascal Borne](#)

[Deep fake video of Ryan Gosling explaining how LLMs work \(8 min: 31 sec\)](#)

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AI Development Timeline – screenshot of YouTube video <https://www.youtube.com/watch?v=VIj2f43sVS4>

Autonomous car, smart speaker, map detail © Google.

Terminator © Tgenisys-t800-endoskeleton-1 by Terminator 2059309 Posted in T-800EndoskeletonSeries  
8xx/GenisysSubdermal Armor

Plinko image - screenshot from The Price is Right video

Gaming computer, graphics board, and graphics chip images from Wikimedia Commons

The sky is blue token/parameter example image-NVIDIA DEVELOPER blog.

ChatGPT, DALL-E, Stable Fusion, and runway logos © of their respective owners

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# Artificial Intelligence for Dinosaurs

Homework: Choose an email address and password first and go to **Openai.com** and sign up for a free ChatGPT account.