

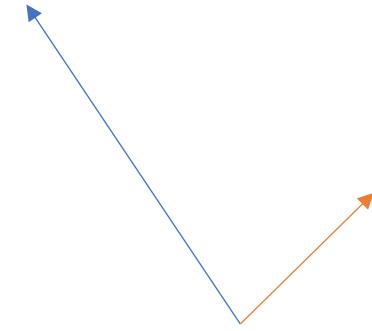
# Collaborate With AIs

Introduction to Prompt Engineering for {Learning, Writing, Coding, and Designing} with AIs

# Language Model (LM)

Model that predicts next token

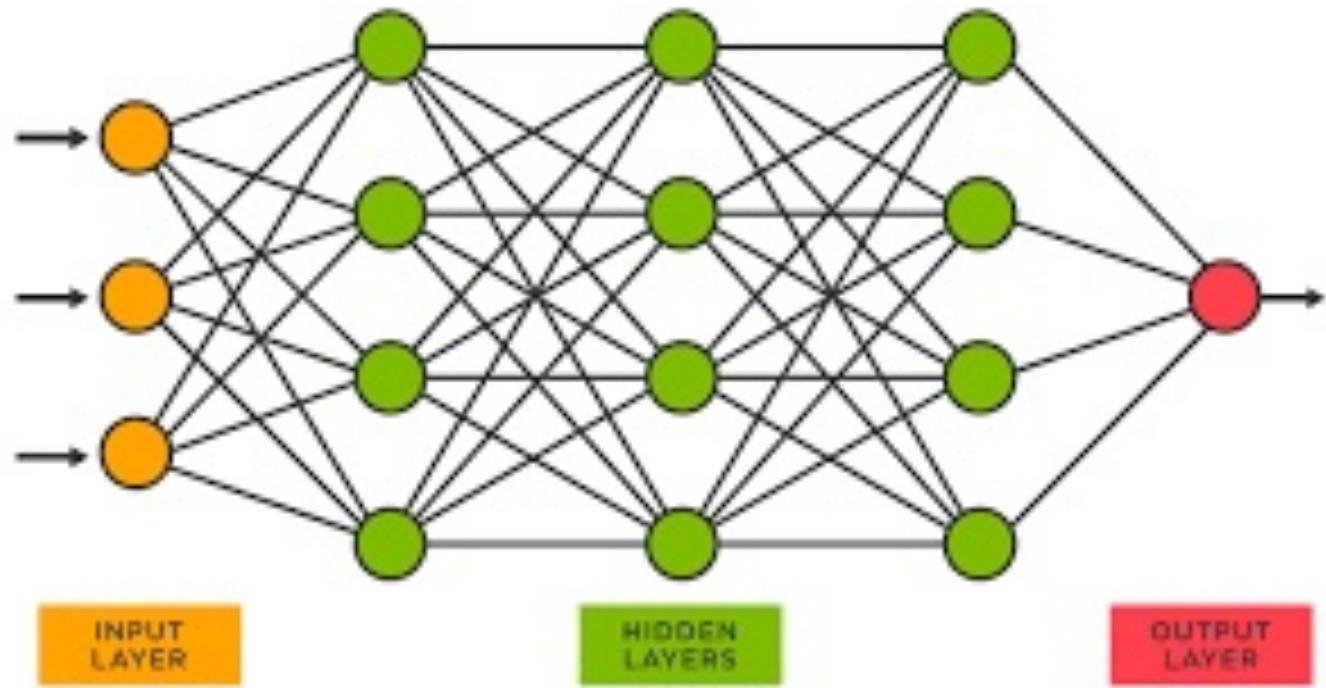
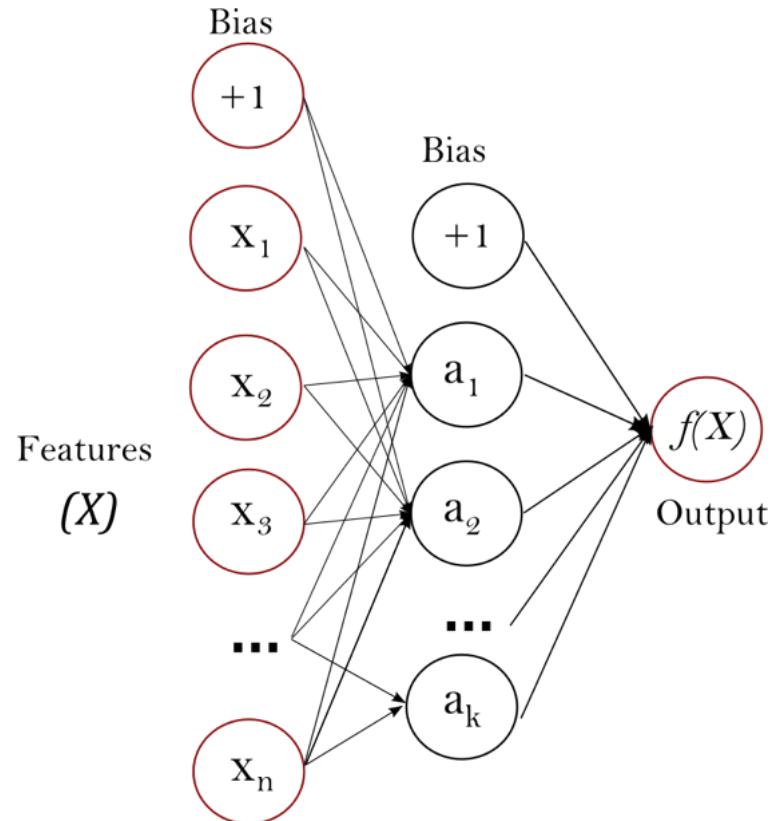
Token: Word/Subword => Number: Vector



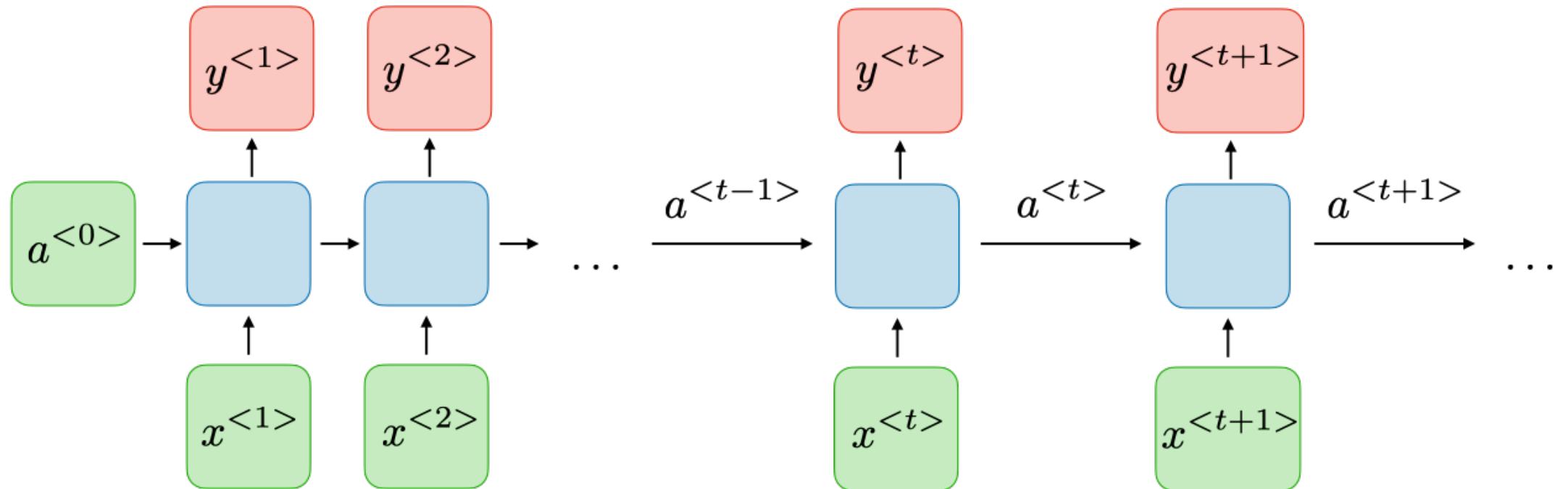
Word/Subword -> Embedding/Token

Model = Function -> Computable: work with Number

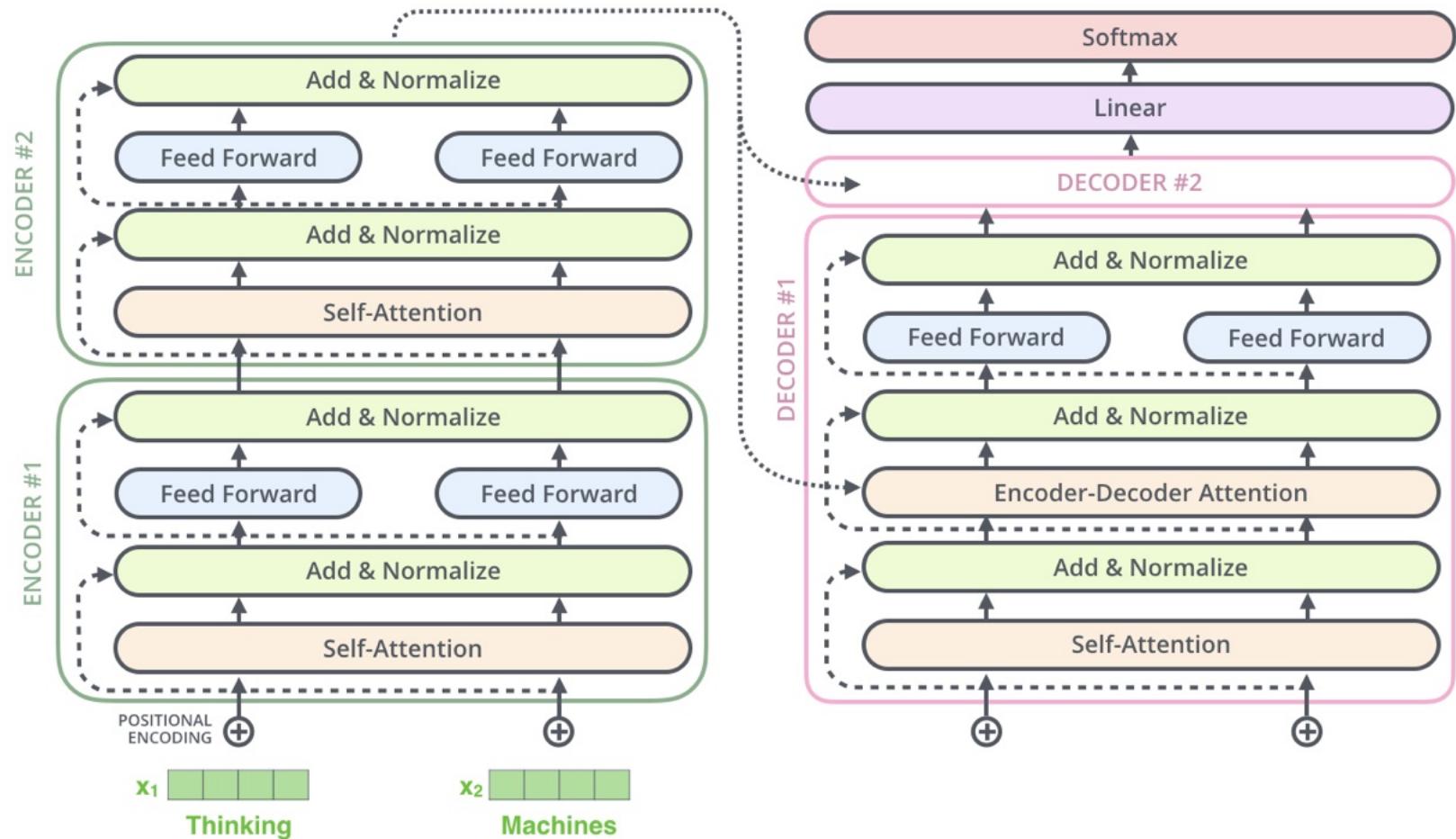
# Neural Network



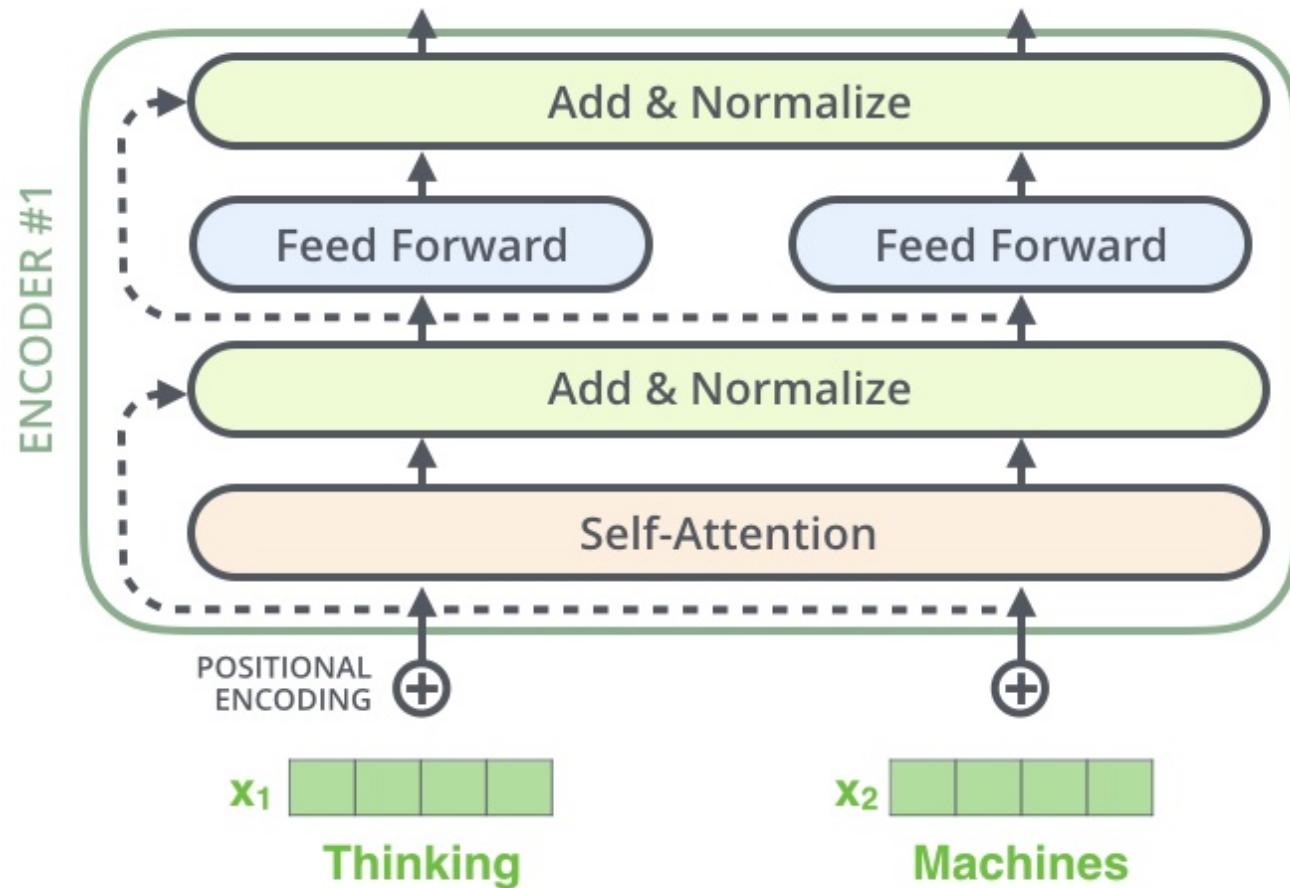
# Long Time Ago: RNN



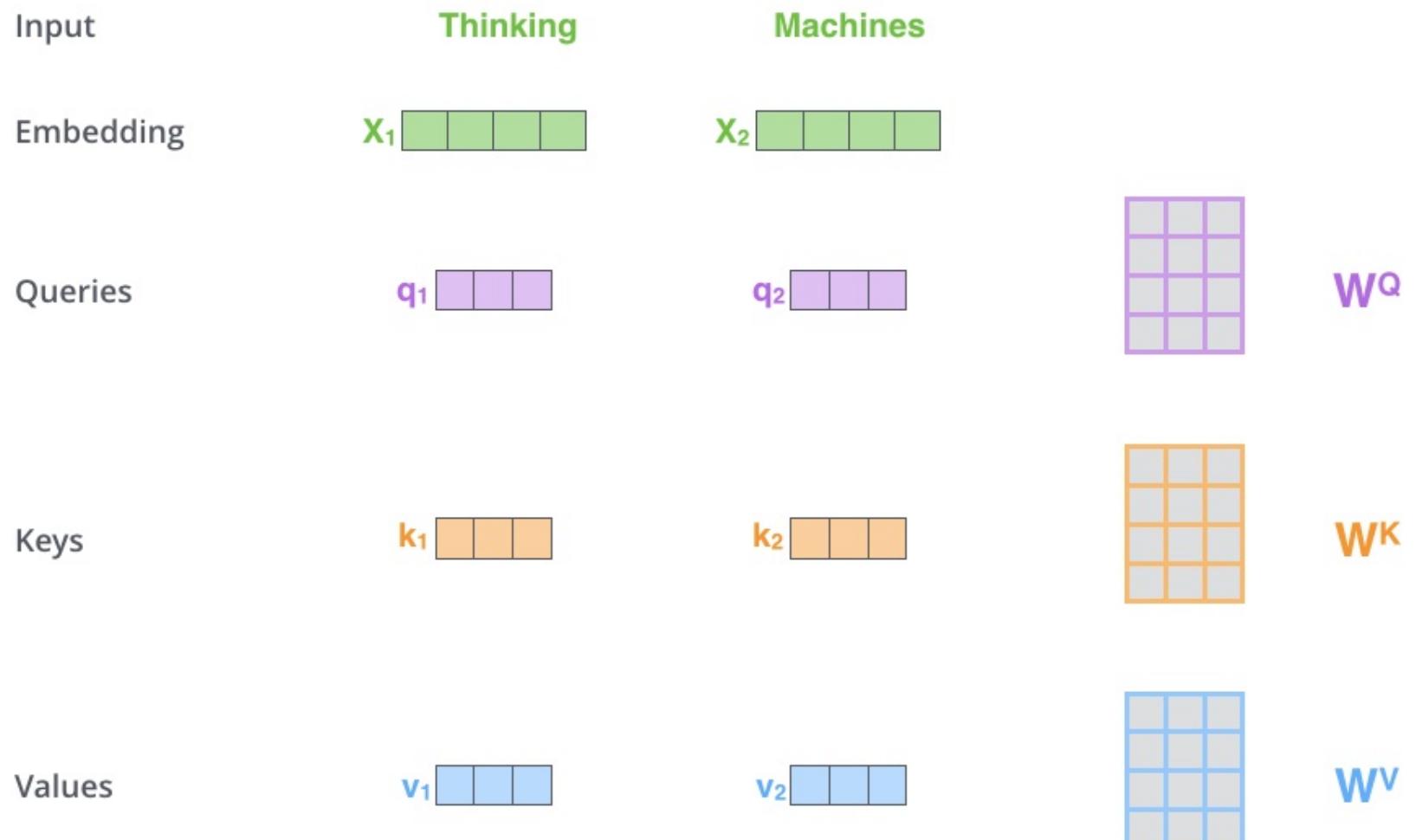
# Transformer: Encoder + Decoder



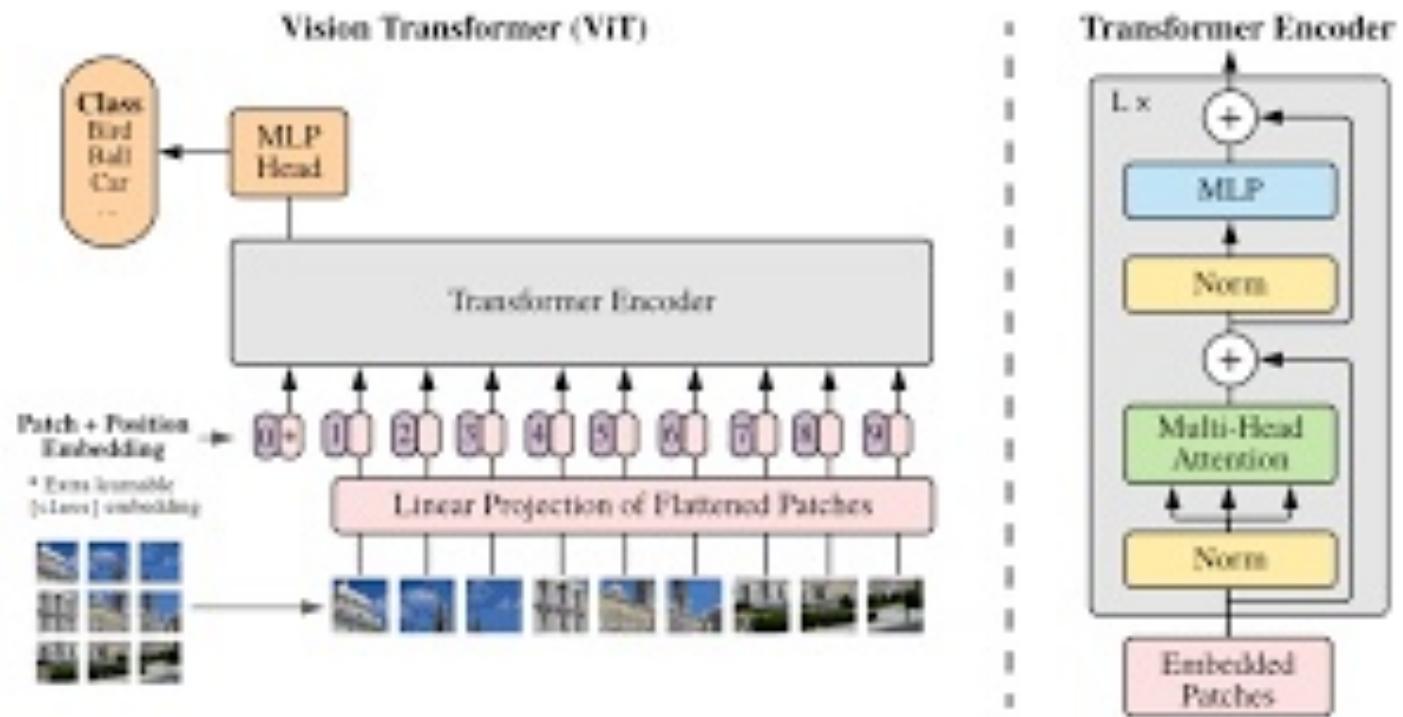
# Transformer



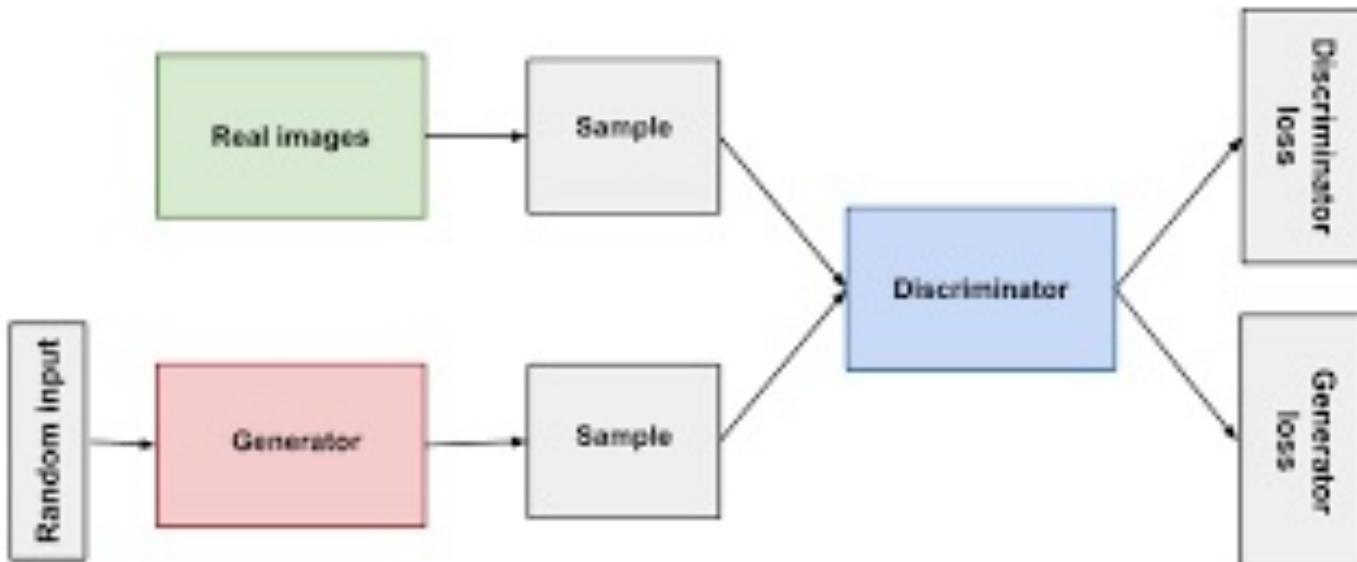
# Intuition: Query Key Value



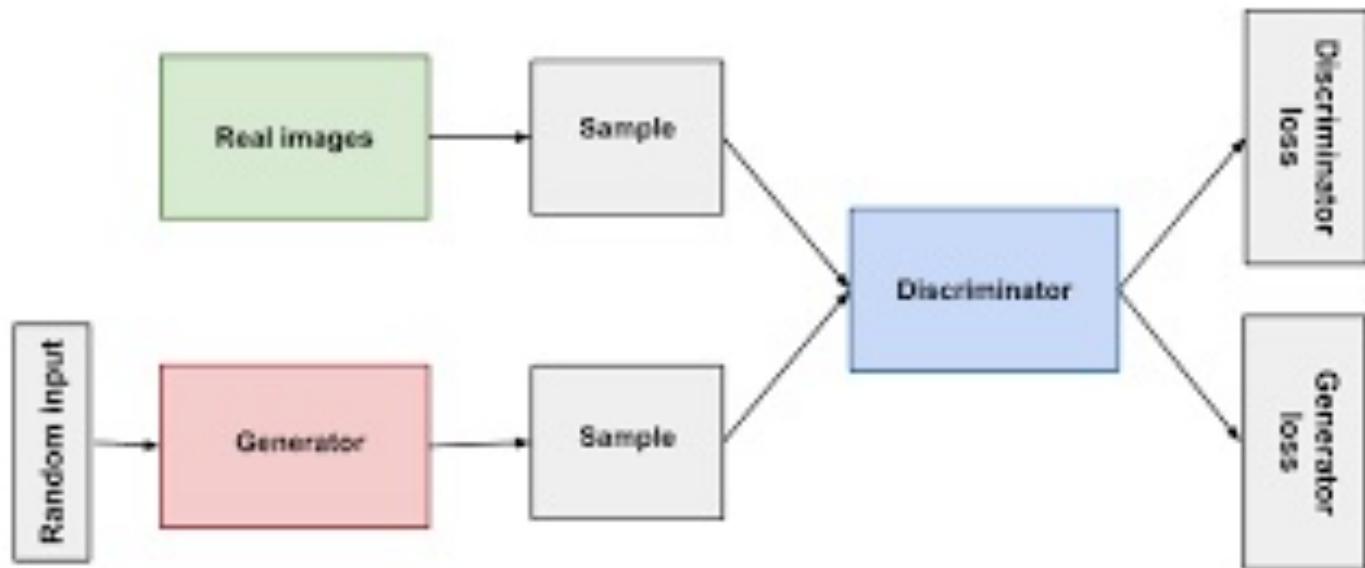
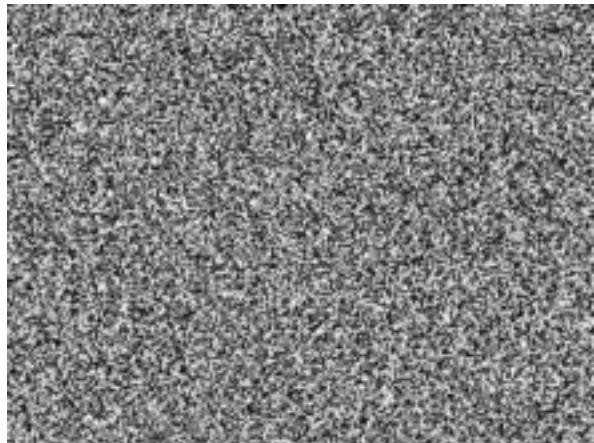
# Line 1: Other modalities



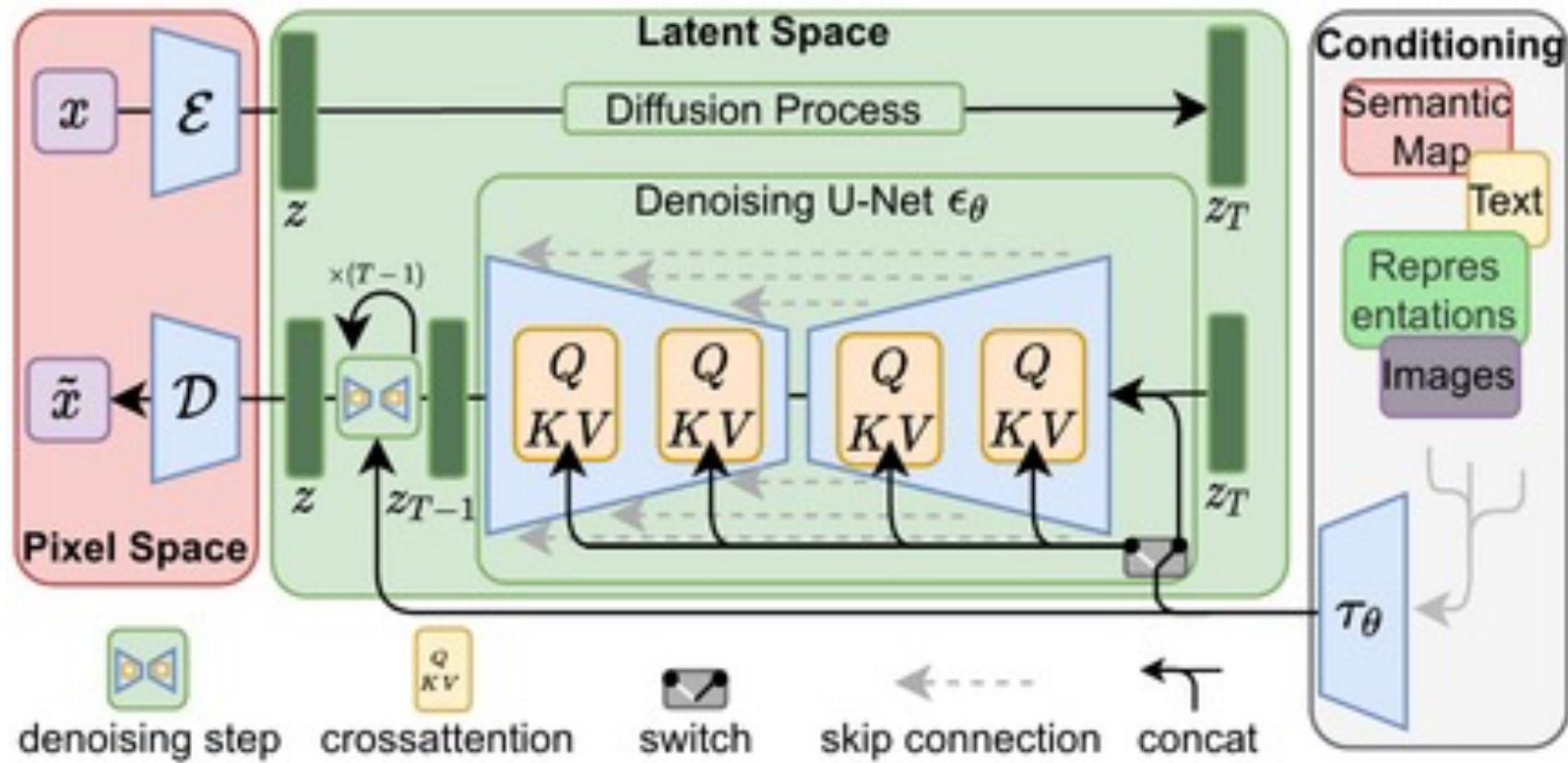
# Aside: Image Generation



# Aside: CGAN

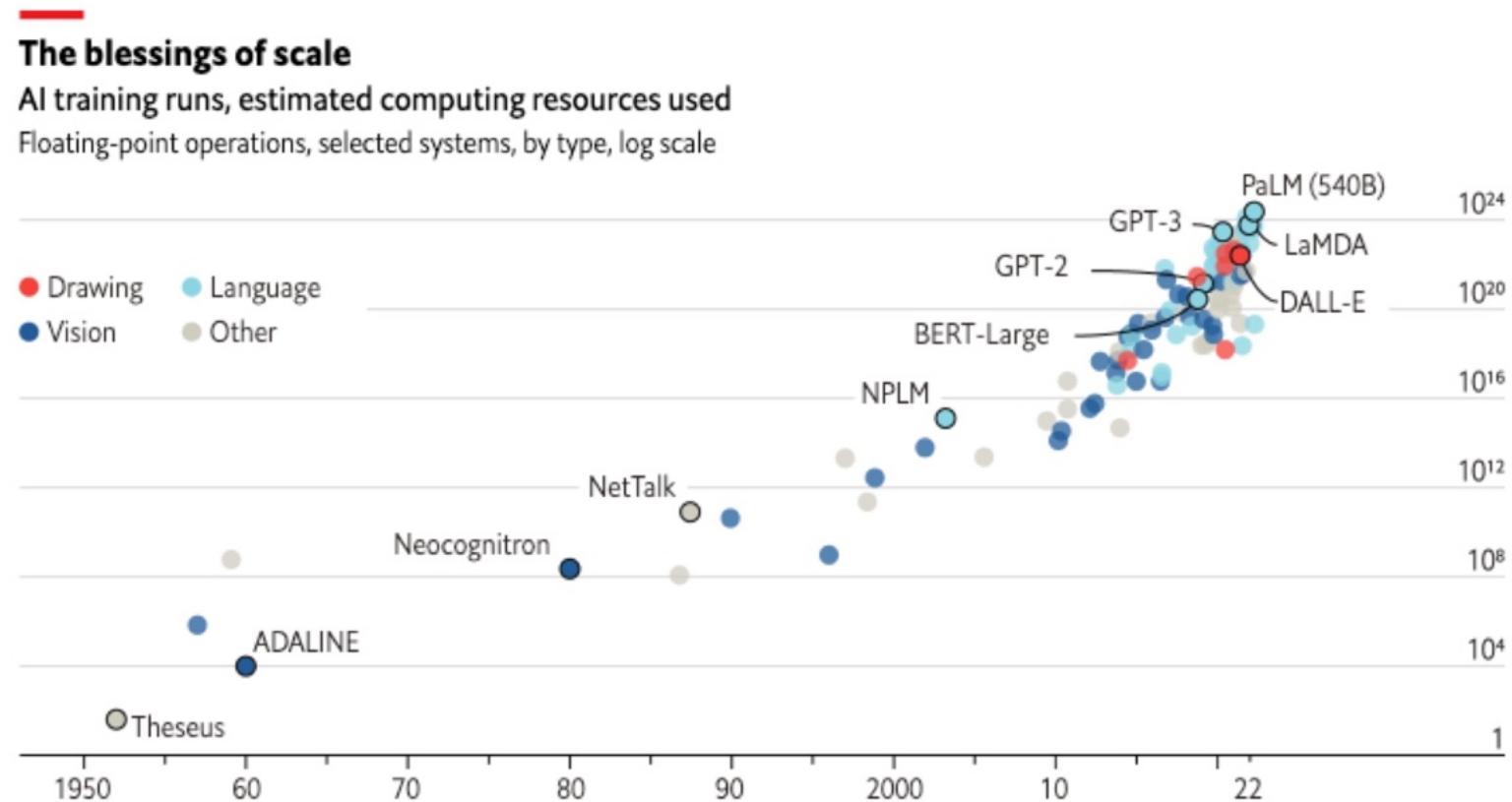


# Stable Diffusion



# Line 2: Scaling Law

More data to the model -> Model must be bigger



Sources: "Compute trends across three eras of machine learning", by J. Sevilla et al., arXiv, 2022; Our World in Data

# Large Language Model (LLMs)

## Emergent Abilities

- In-context learning -> perform unseen tasks during inferencing

650 tasks

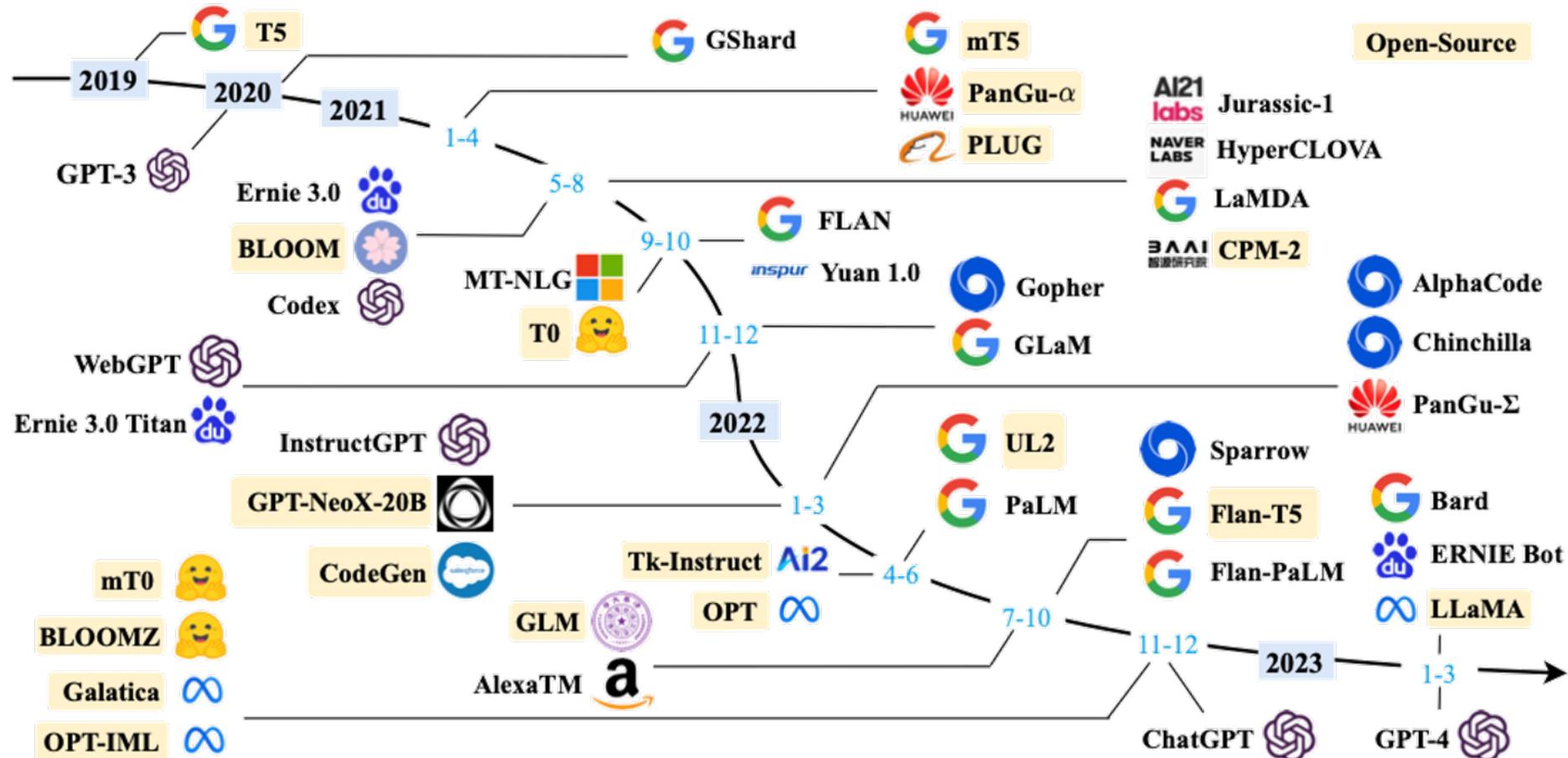
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500M parameters+

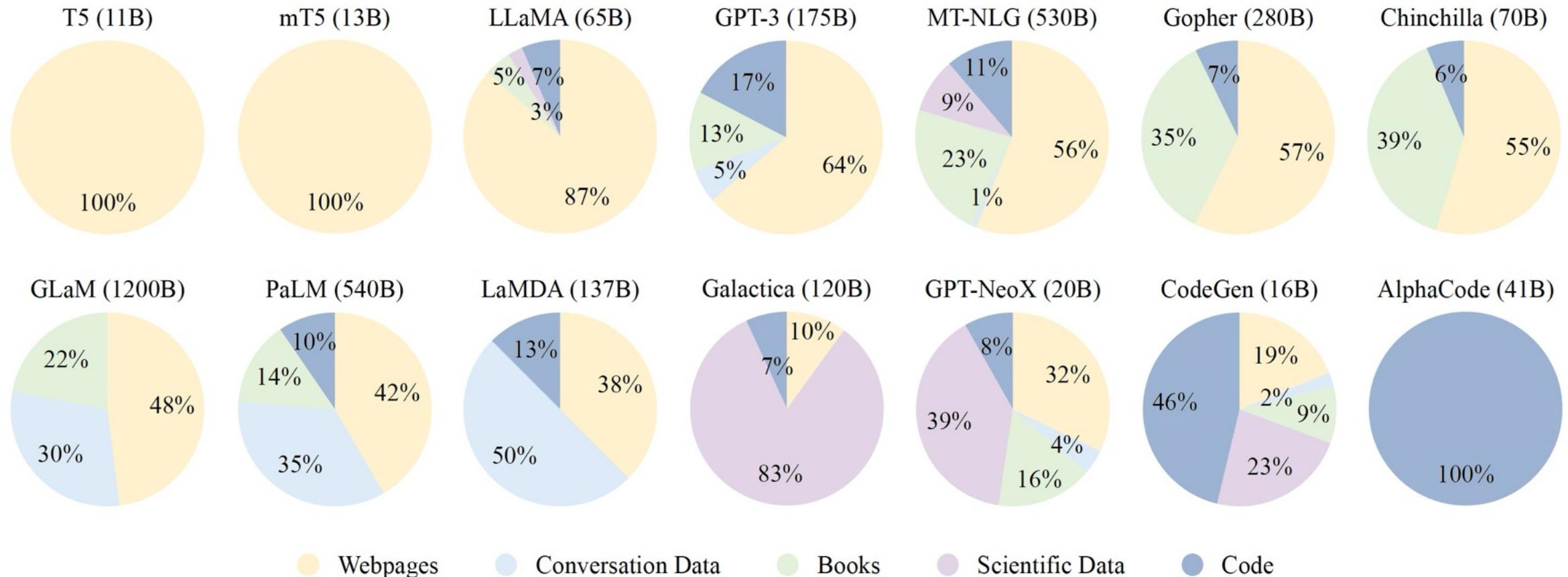
PaLM 540B paramters

GPT-3.5 175B parameters

# We Are In The Age of AIs Boom



# Every LLM is different!



# Model Card

# Prompt Engineering Is A New Google Skills

Prompt Engineering: ways to **interact** with LLMs to get **desired** results

- Giving instruction (zero-shot prompting)
- Role prompting

Learn more: <https://learnprompting.org>

# Giving Instructions: General Tips

- Write **clear** instructions
- Be **explicit** about the desired output (*in some cases*)
- Explicitly state what is **not desired**
- Give more **context!**
- Begin with **verb**
- Try a lot! Even a small change can have a big impact

# Example: ChatGPT

Generate an email to a Professor to let him know that I am sick and cannot present in the next week.

# Example: ChatGPT

Generate a polite email to a Professor to let him know that I am sick and cannot present in the next week.

Verb | Modifier? | Output | Context

# Example: ChatGPT

Subject: Unable to present in next week's class

Dear Professor [Name],

I hope this email finds you well. I am writing to let you know that unfortunately, I am not feeling well and will not be able to present in next week's class as scheduled. I apologize for any inconvenience this may cause and I would like to assure you that I am taking all the necessary measures to recover as soon as possible.

I am disappointed that I will not be able to present my work as planned, but I am confident that my classmates will do an excellent job in my absence. If there are any assignments or materials that I can complete remotely, I would be happy to do so.

I will keep you informed of my recovery and availability to return to class. Thank you for your understanding and support during this time.

Sincerely,

[Your Name]

# Give Context via Role

Instead of explicitly stating all the context, giving a **role** to a LLM can help a lot

# Example: ChatGPT

You are a copywriter for Apple. Write 5 copies for the new iPhone.

# Example: ChatGPT

You are a copywriter for Apple. Write 5 copies for the new iPhone.

Role | Output | Context

# Example: ChatGPT

1. The new iPhone is here, and it's better than ever. With its sleek design, advanced camera, and lightning-fast processing speed, it's the perfect phone for anyone who demands the best.
2. Upgrade your life with the new iPhone. With features like Face ID, wireless charging, and a stunning OLED display, it's the ultimate smartphone experience.
3. The new iPhone is more than just a phone. It's a powerful tool for creativity, productivity, and staying connected with the people you care about. Get yours today and discover what's possible.
4. With the new iPhone, you'll never miss a moment. Its cutting-edge camera technology and advanced image processing make it easy to capture stunning photos and videos, no matter where you are.
5. Say hello to the future with the new iPhone. Featuring the latest technology and a stunning design, it's the ultimate smartphone for anyone who wants to stay ahead of the curve. Get yours today and experience the next generation of mobile computing.

# Zero-shot Prompting

# Few-shot Prompting

Give examples to LLMs

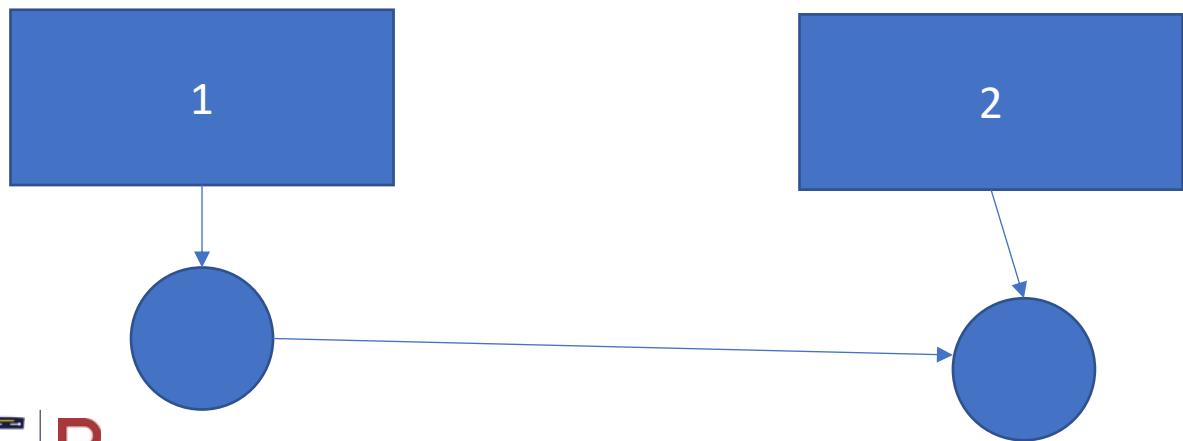
# Generated Knowledge Prompting

# Chain-of-Thought Prompting

# Zero-shot Chain-of-Thought Prompting

# Self-consistency

# Least to Most Prompting



# Priming Prompt

First prompt will influence the rest of the conversation

# Applications

## Coding

- PoC
- Fixing bugs
- Explain
- Convert to another language

## Writing

- Email
- Report
- Blog

## Brainstorming

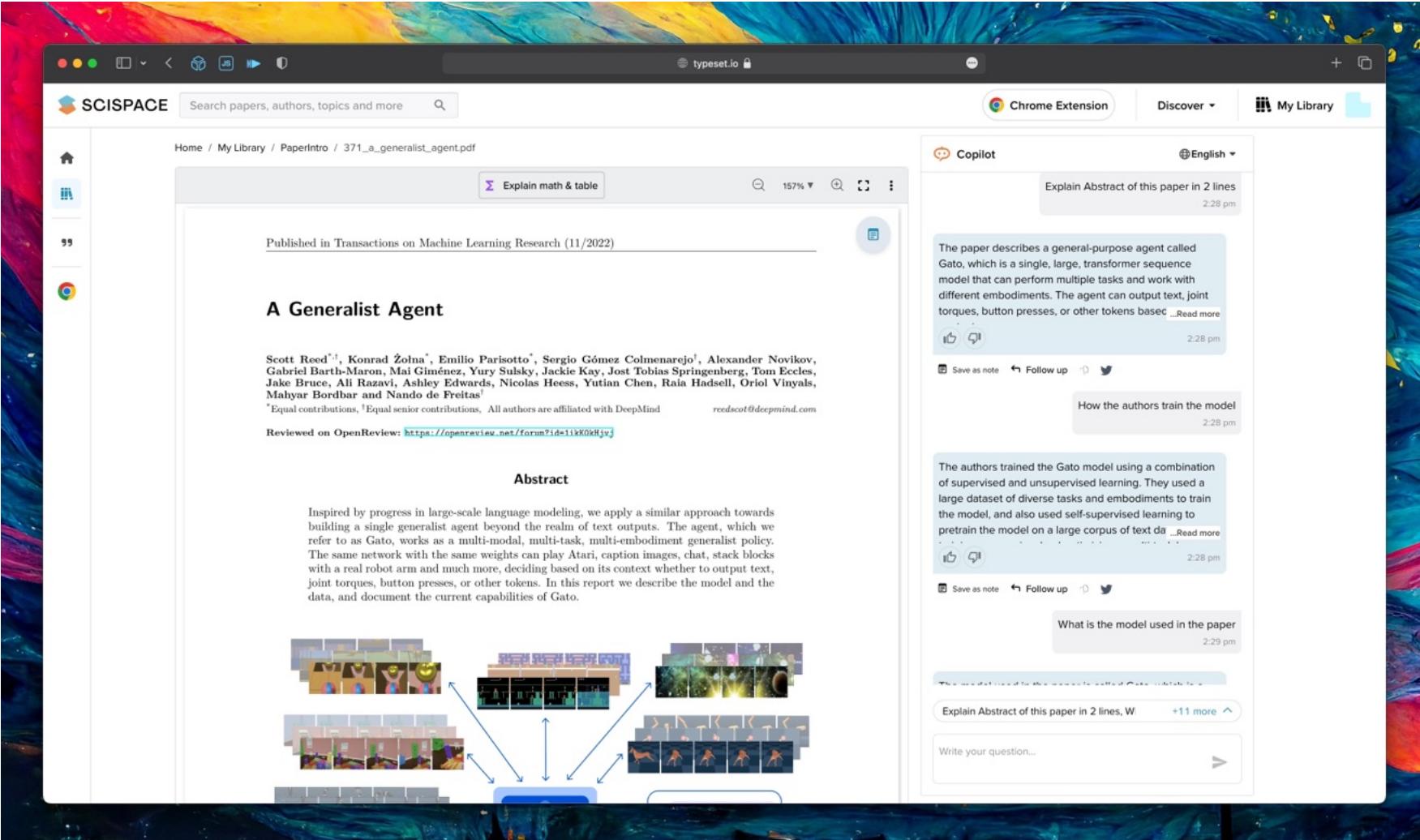
## Explain

## Quizz

# How I Learn With AIs

Typeset.io

# Typeset.io: A Companion for Reading Papers



# Alternatives

I acknowledge that ChatGPT API or ChatGPT with plugins and Bing may be able to complete this task as well.

# How I Write With AIs

ChatGPT



# Common Prompts That I Used

Correct grammatical errors and improve it.

{Text}

Paraphrase the following {sentences, paragraphs}.

{Text}

Suggest alternatives for each [BLANK].

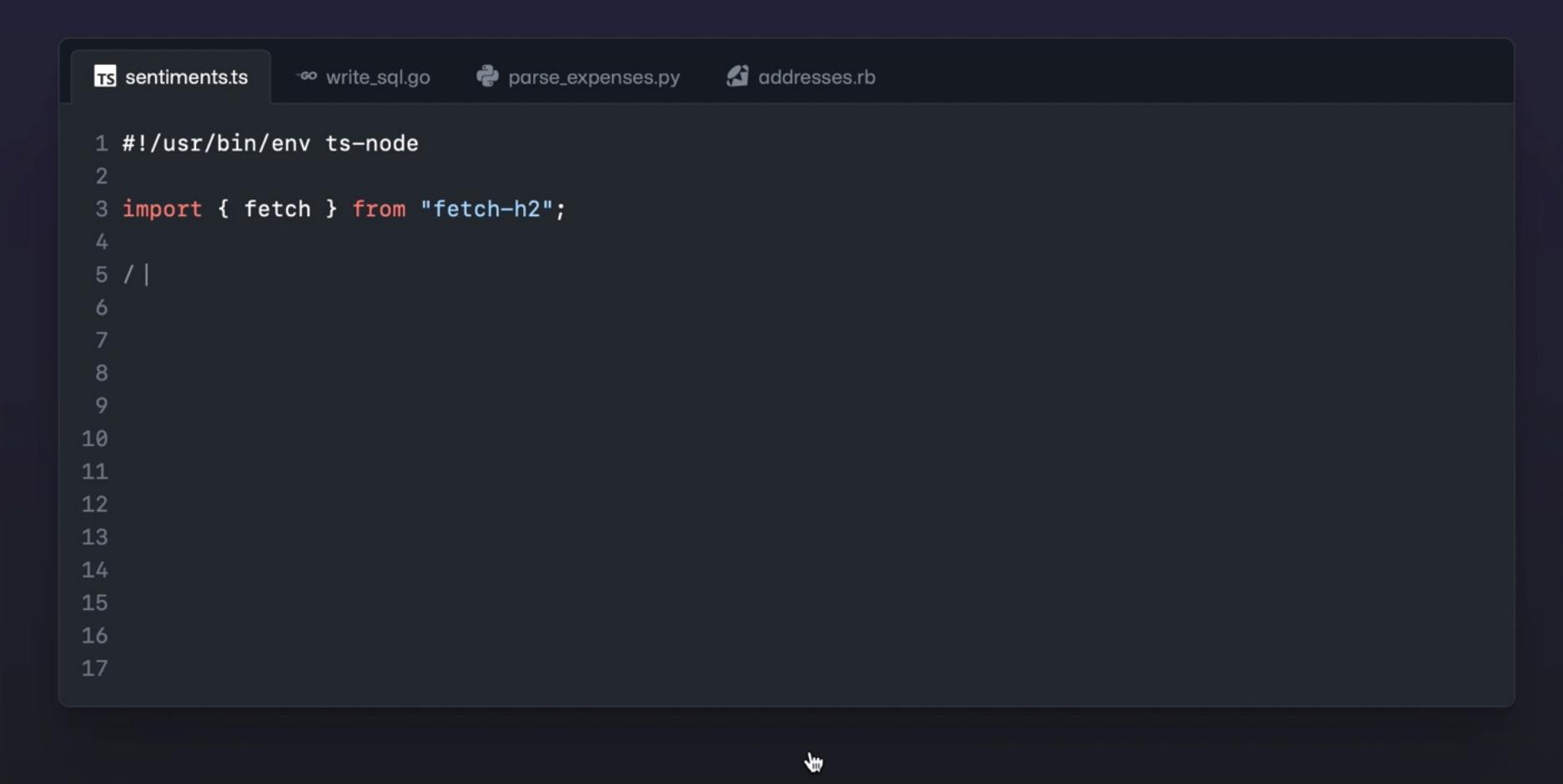
{Text containing [BLANK]s}

# How I Code With AIs

GitHub Copilot | ChatGPT



# GitHub Copilot: Free for Students!



The screenshot shows a dark-themed code editor interface. At the top, there are four tabs: 'sentiments.ts' (selected), 'write\_sql.go', 'parse\_expenses.py', and 'addresses.rb'. The main area displays a snippet of TypeScript code:

```
1 #!/usr/bin/env ts-node
2
3 import { fetch } from "fetch-h2";
4
5 / |
6
7
8
9
10
11
12
13
14
15
16
17
```

A small cursor icon is visible at the bottom center of the editor window.

# Common Prompts That I Used

Fix and explain bugs in the following code snippet.

```

{Code}

```

Convert the following {Language#1} code snippet into {Language#2}.

```

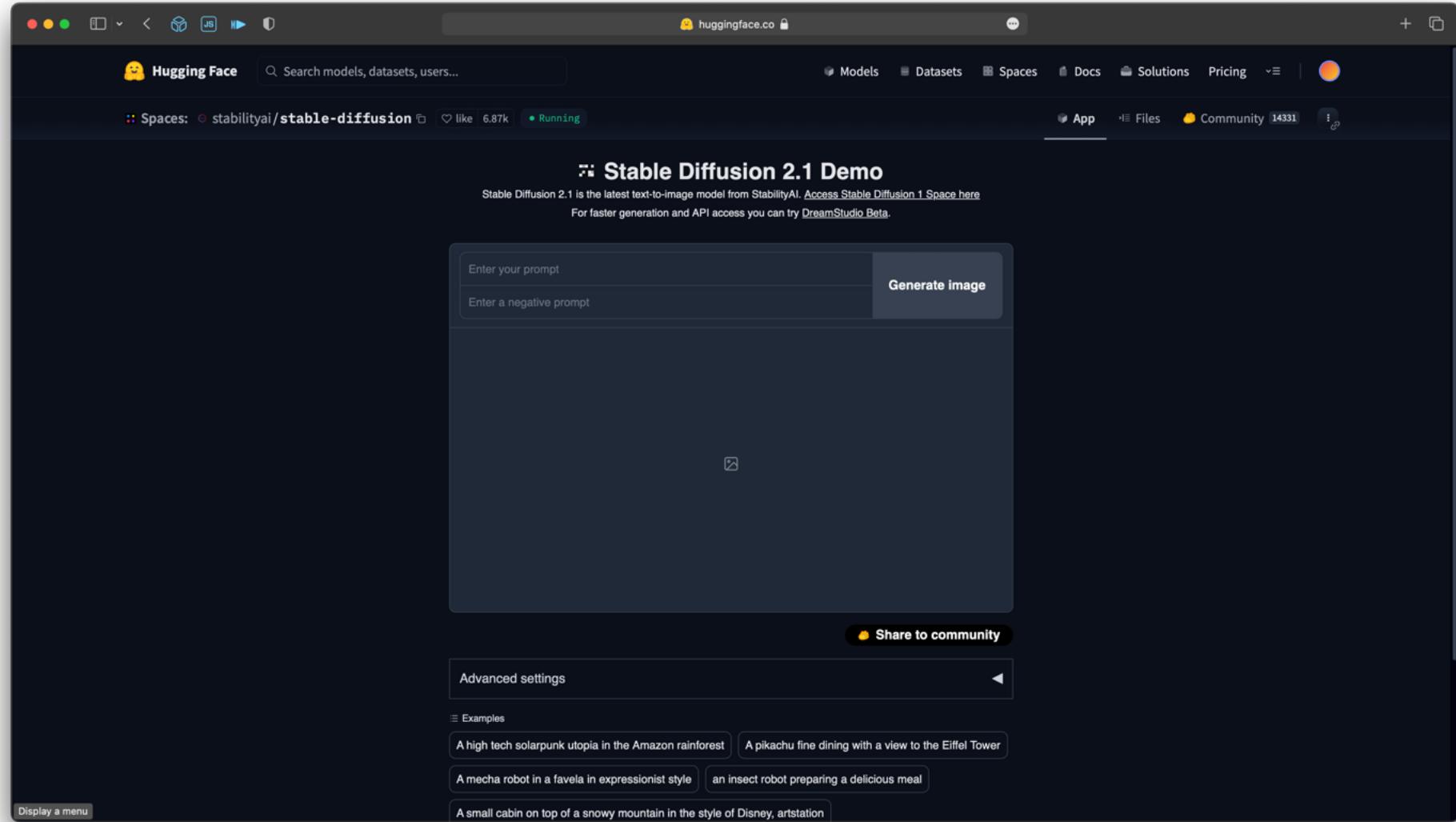
{Code}

```

# How I Design With AIs

Stable Diffusion | Image Creator | DALL-E 2

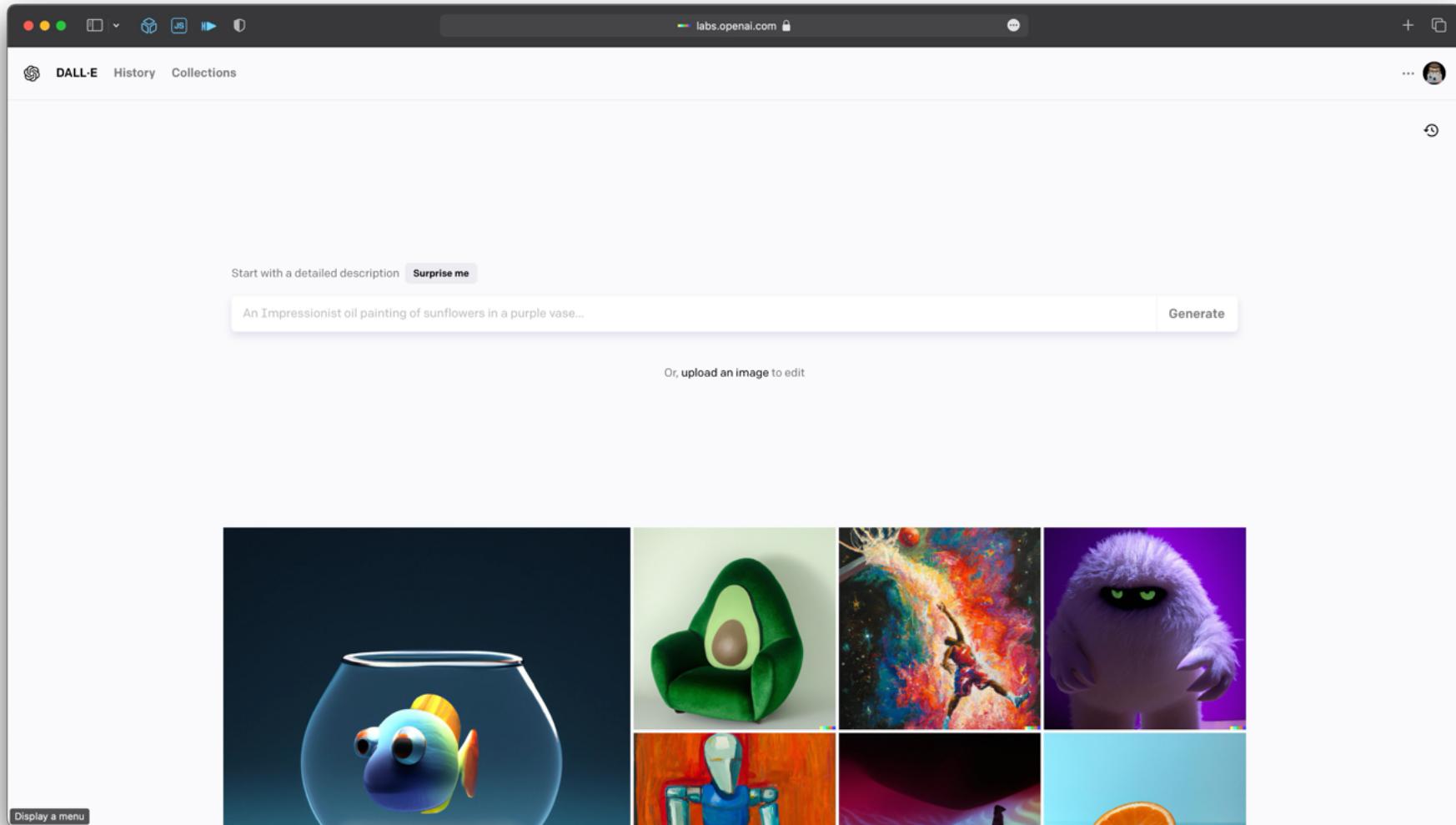
# Stable Diffusion: Hard to Give a Good Results



# Image Creator (Bing AI)

The screenshot shows the Microsoft Bing Image Creator interface. At the top, there's a navigation bar with the Microsoft Bing logo, a search bar, and a 'PREVIEW' button. Below the bar, a message says: "Want to see how Image Creator works? Select Surprise me for a suggested prompt, then select Create." On the right side, there's a sidebar with various icons and a user profile for Pittawat, showing 144 boosts. A central modal window displays a message: "You have 25 boosts for today! Use your boosts to create images more quickly. If you run out, image generation may take longer." Below this, there are three small images with warning messages: "Text may not look quite right.", "Faces and hands can look distorted.", and "The system might misinterpret your prompt." In the main content area, there are two tabs: "Explore ideas" (which is selected) and "Creations". Under "Explore ideas", there are six thumbnail images: a ring with pearls, a snowy cabin in a forest, a vintage computer monitor, a close-up of a person's eye with colorful makeup, a robotic DJ, and a panda wearing a chef's hat. At the bottom of the page, there are links for "Privacy and Cookies", "Content Policy", "Terms of Use", "Feedback", and "Created with AI".

# DALL-E 2: SOTA!?



# Example of Prompt and Images

A professional company logo in logotype style with three letters I, C, and E. The logo has a futuristic vibe and represents the objective of the lab about game and artificial intelligence.



# Example of Prompt and Images

A professional company logo in logotype style with three letters I, C, and E. The logo has a futuristic vibe and represents the objective of the lab about game and artificial intelligence. **A logo has a part of game controller and the electrical wires.**



# Example of Prompt and Images

A professional company logo in logotype style with three letters I, C, and E. ICE stands for Intelligence Computing Entertainment. The logo has a futuristic vibe and represents the objective of the lab about game and artificial intelligence. A logo has a part of game controller and the electrical wires. The logo is in blue on a white background.



# My Real Workspace on Figma

