fossasia

Operation on Local AI Agent:

Test Drive on Deepseek-R1 Reasoning
and AutoGen with .NET and Ollama

Created By

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Microsoft Learn Student Ambassador
Thai Student Developer Lead

Session Speaker

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+ Microsoft Office Specialist (Excel)

+ Open-source small AI and NLP Researcher

+ Applied Skills Challenger (Azure AI Document Intelligence and NLP)

in Charunthon Limseelo

@boatchrnthn

Charunthon Limseelo

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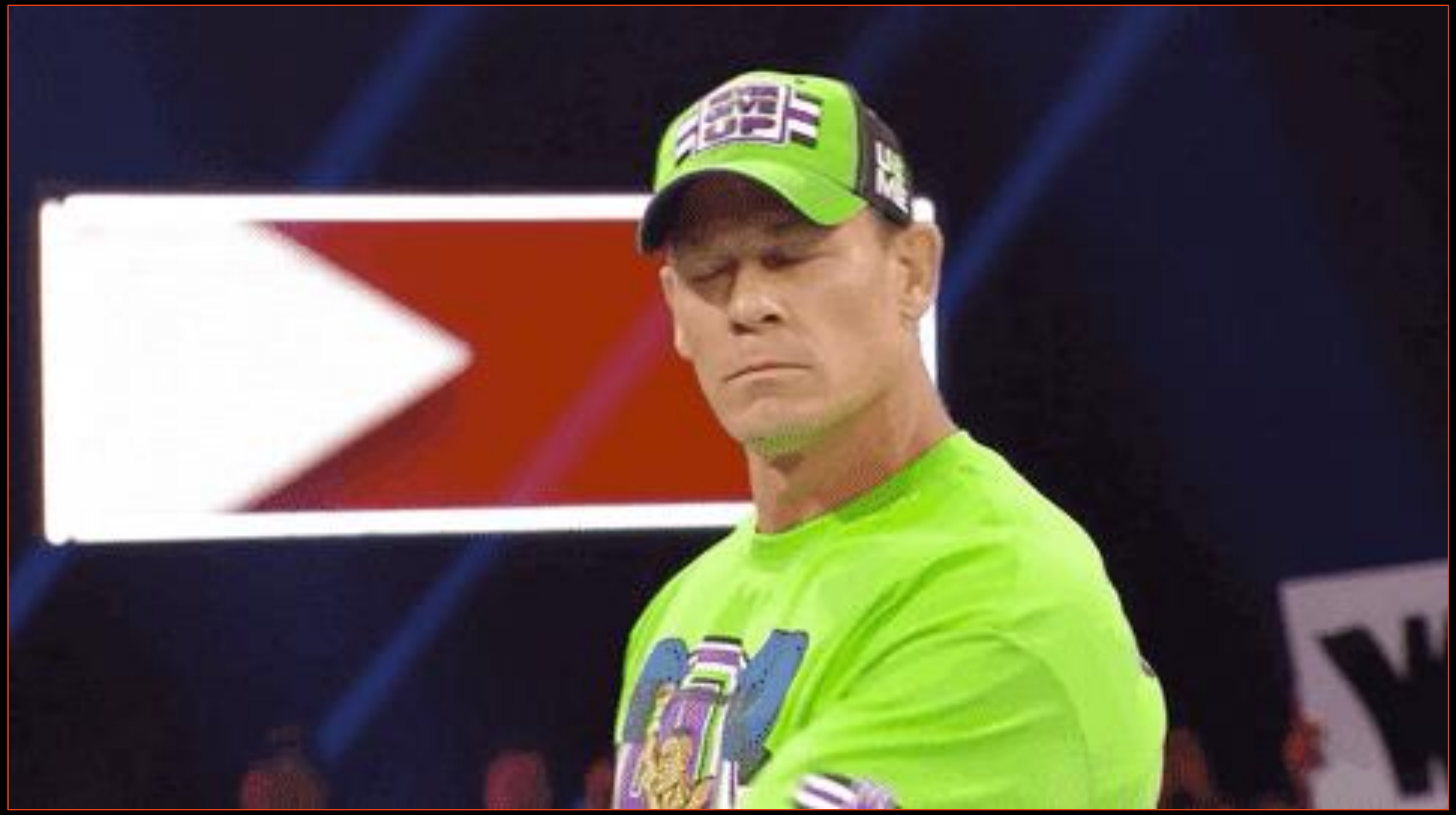
1. Language Models Controversy

How it becomes controverted? What is nowadays problem?



You might wonder something …..

When **OpenAI** is not **“Open”** AI

Comparing these two types of models

Proprietary

(adj.) used, made, or marketed by one having the exclusive legal right, privately owned and managed and run as a **profit-making** organization, Close-Source

Ex. OpenAI-GPT, Gemini, Claude

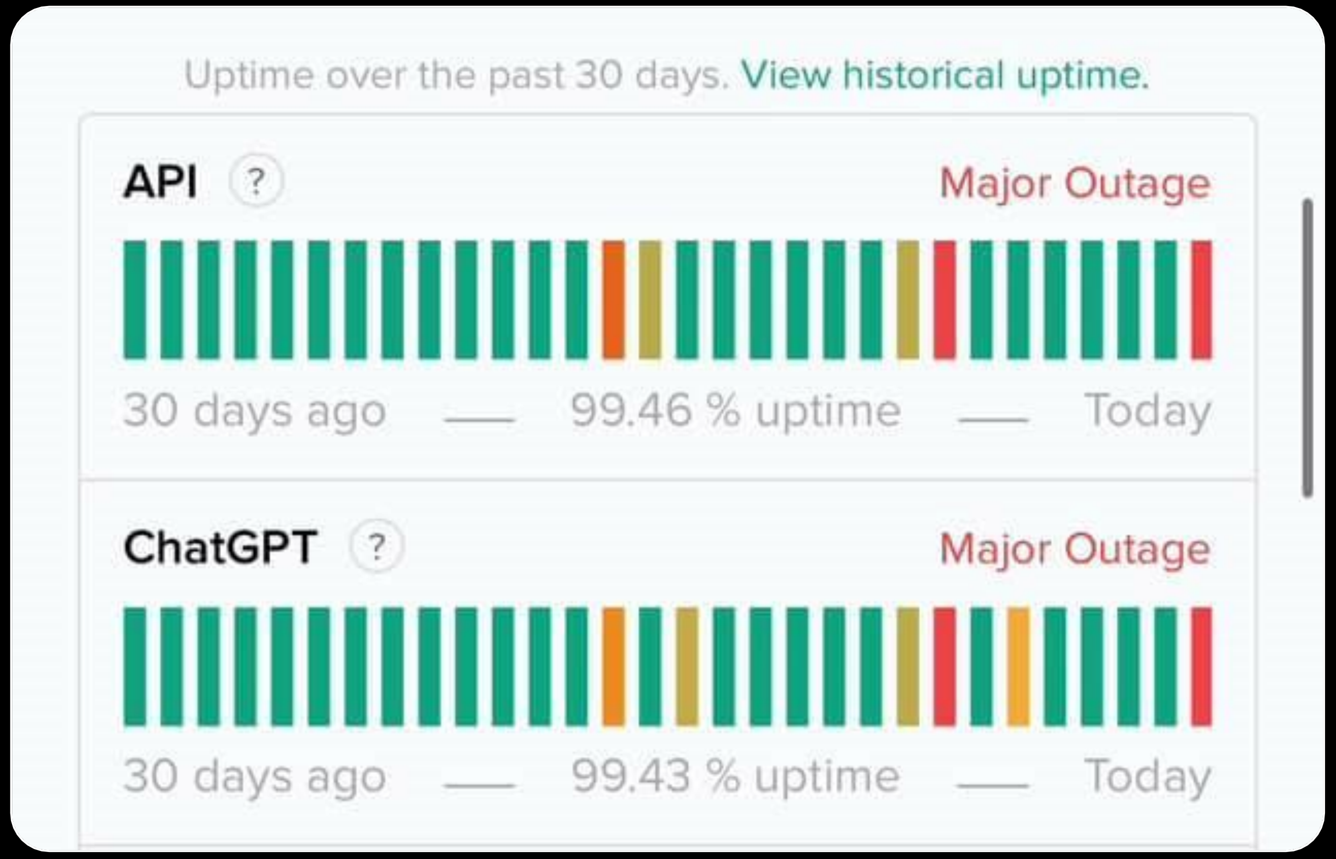
Open Models

(adj.) having the source model **freely available** for possible modification and redistribution, along with publicly available for use by the community.

Hugging Face

And yet we have some problems for OpenAI

OpenAI Major Outage



Uptime over the past 30 days. View historical uptime.

API ? Major Outage

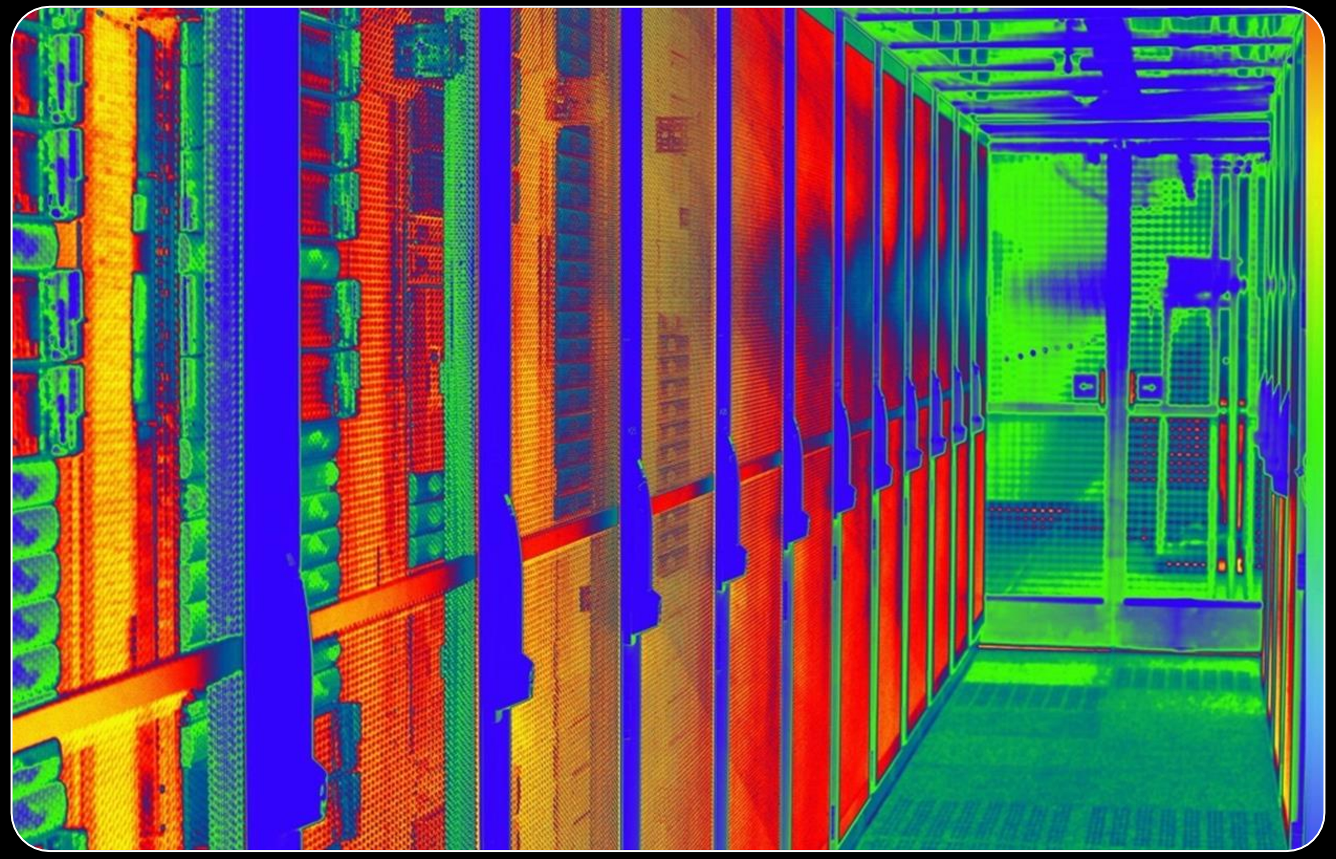
30 days ago — 99.46 % uptime — Today

ChatGPT ? Major Outage

30 days ago — 99.43 % uptime — Today

OpenAI has experienced outages, disrupting services like ChatGPT due to factors like cloud provider failures or high demand.

Highly Computation

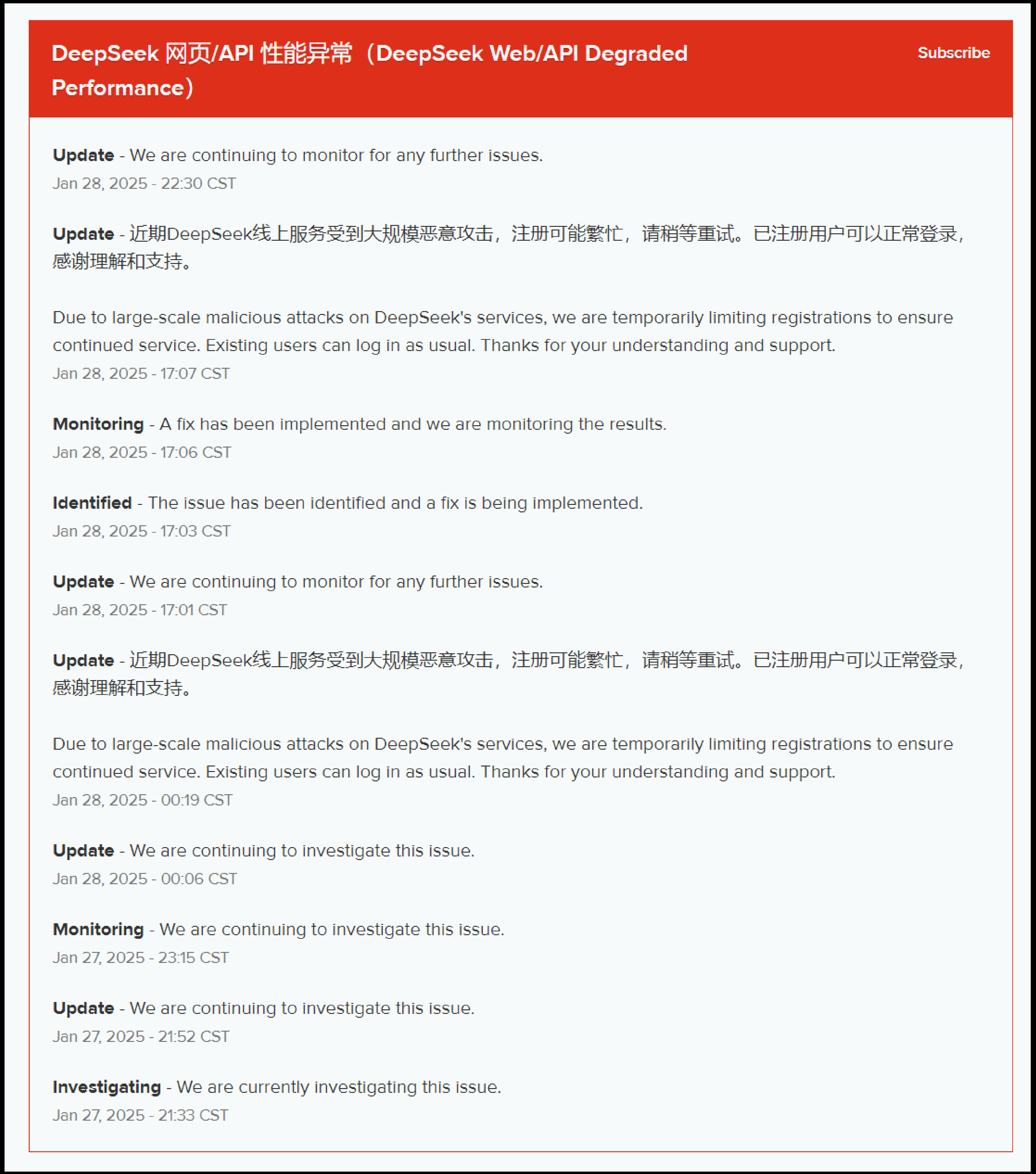


GPT models need substantial computational resources, which can result in challenges with contextual understanding and responsiveness.

High Cost for Operation

Running GPT models is expensive due to high hardware and electricity costs, making it difficult for smaller organizations to afford.

And yet we have a same problem with Deepseek API



DeepSeek 网页/API 性能异常（DeepSeek Web/API Degraded Performance）

Update - We are continuing to monitor for any further issues.
Jan 28, 2025 - 22:30 CST

Update - 近期DeepSeek线上服务受到大规模恶意攻击，注册可能繁忙，请稍等重试。已注册用户可以正常登录，感谢理解和支持。

Due to large-scale malicious attacks on DeepSeek's services, we are temporarily limiting registrations to ensure continued service. Existing users can log in as usual. Thanks for your understanding and support.
Jan 28, 2025 - 17:07 CST

Monitoring - A fix has been implemented and we are monitoring the results.
Jan 28, 2025 - 17:06 CST

Identified - The issue has been identified and a fix is being implemented.
Jan 28, 2025 - 17:03 CST

Update - We are continuing to monitor for any further issues.
Jan 28, 2025 - 17:01 CST

Update - 近期DeepSeek线上服务受到大规模恶意攻击，注册可能繁忙，请稍等重试。已注册用户可以正常登录，感谢理解和支持。

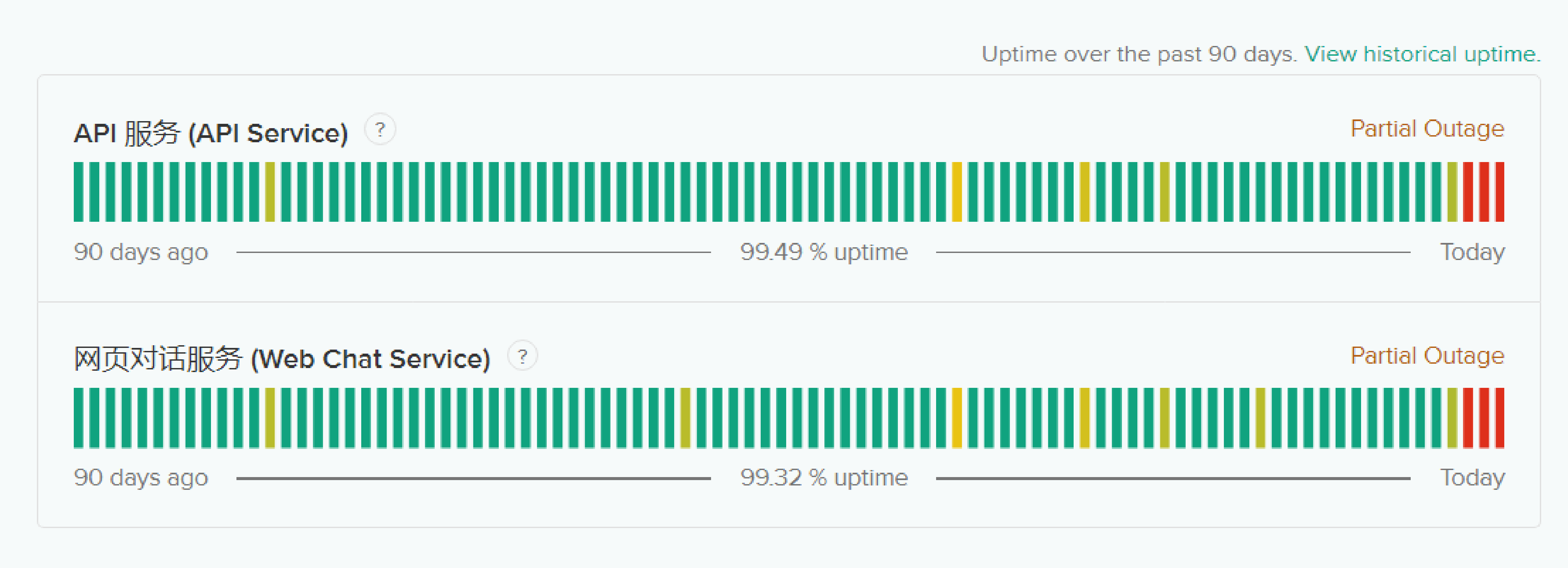
Due to large-scale malicious attacks on DeepSeek's services, we are temporarily limiting registrations to ensure continued service. Existing users can log in as usual. Thanks for your understanding and support.
Jan 28, 2025 - 00:19 CST

Update - We are continuing to investigate this issue.
Jan 28, 2025 - 00:06 CST

Monitoring - We are continuing to investigate this issue.
Jan 27, 2025 - 23:15 CST

Update - We are continuing to investigate this issue.
Jan 27, 2025 - 21:52 CST

Investigating - We are currently investigating this issue.
Jan 27, 2025 - 21:33 CST



Uptime over the past 90 days. View historical uptime.

API 服务 (API Service) ? Partial Outage

90 days ago 99.49 % uptime Today

网页对话服务 (Web Chat Service) ? Partial Outage

90 days ago 99.32 % uptime Today

Incident Report on January 28th, 2025

2. Small Language Models

How it becomes small? What is its use cases?

Small Language Models

Cost Effectiveness

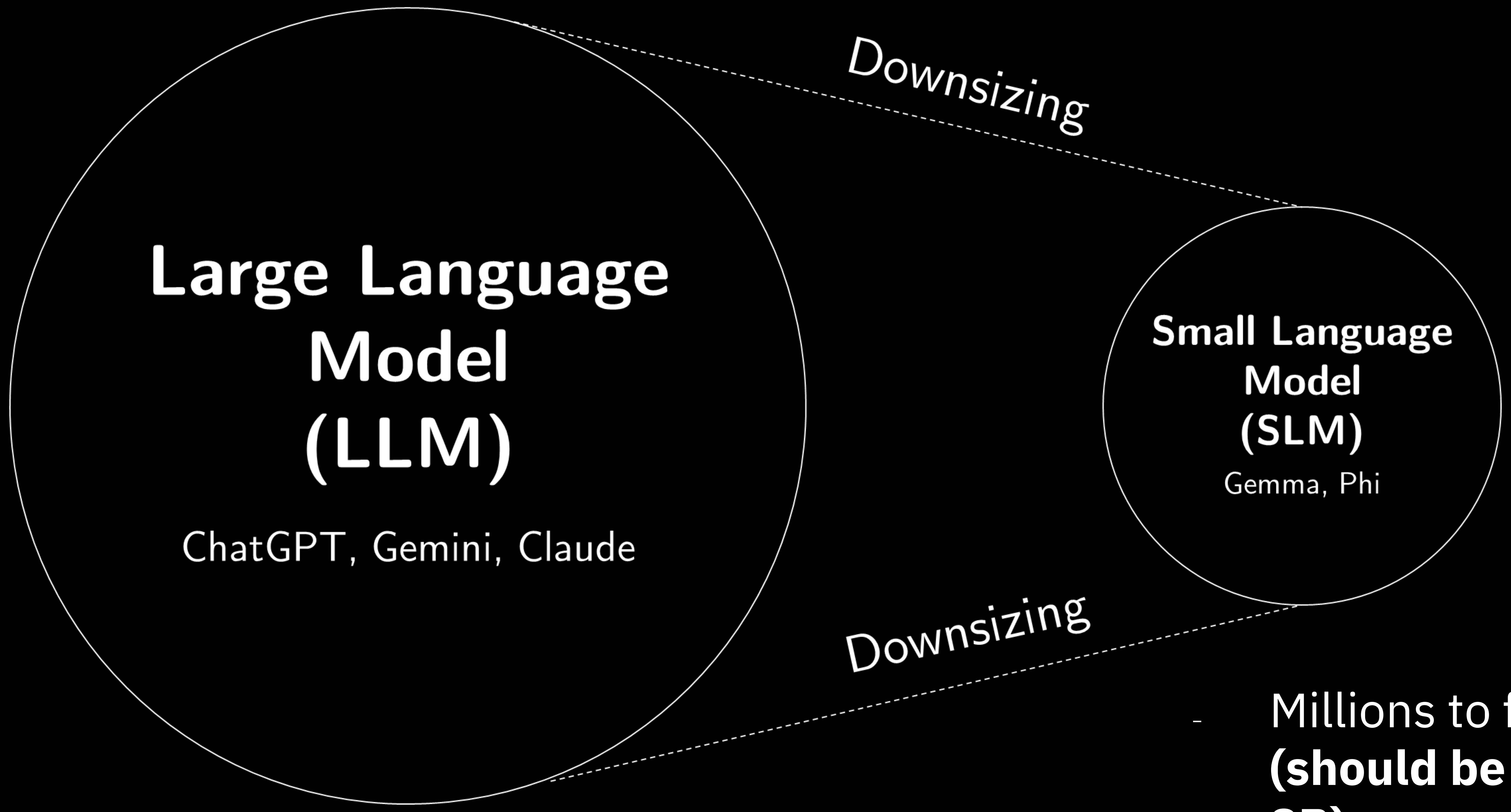
Deployment Flexibility

Ultra-low Latency

Easier to Customize

Language Model Size Comparison

Large Size
More Generic
More Cost



Large Language Model (LLM)

ChatGPT, Gemini, Claude

Downsizing

Downsizing

Small Language Model (SLM)

Gemma, Phi

Small Size
More Specific
Less Cost

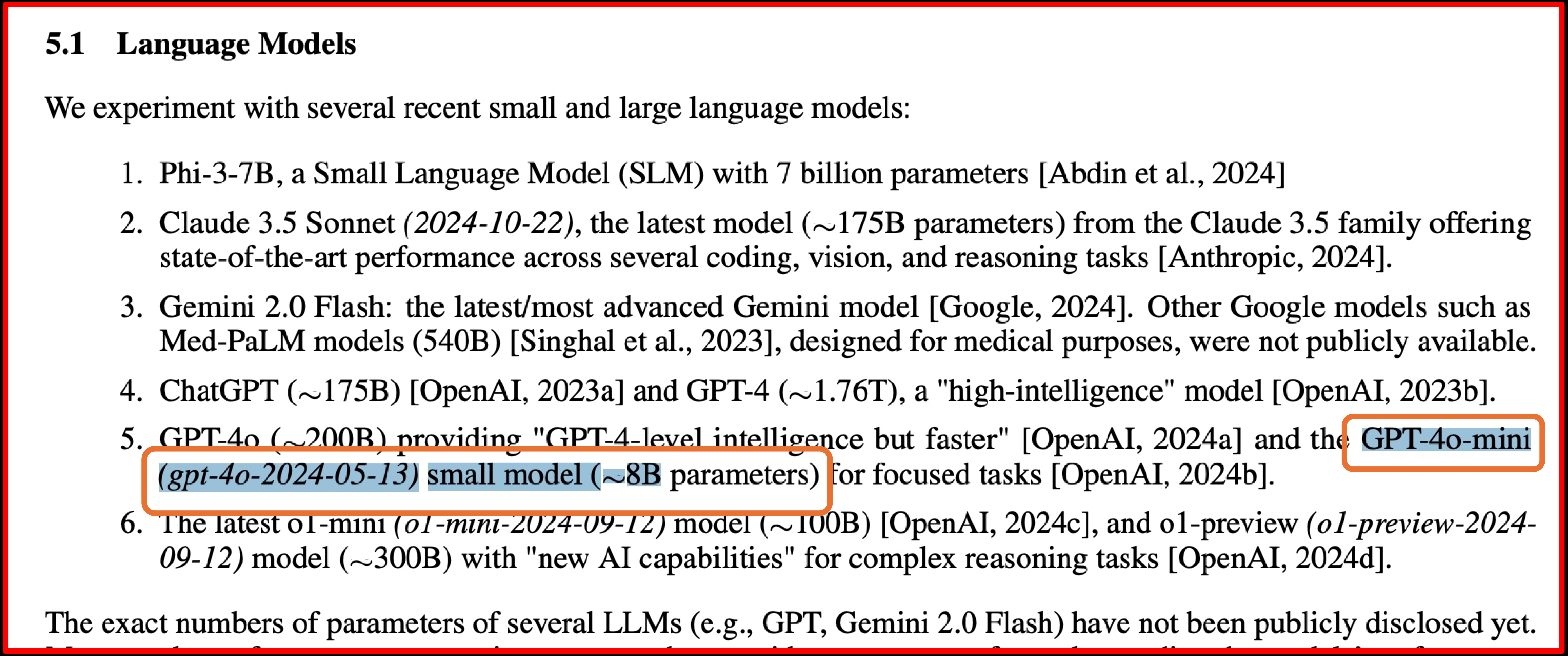
- More than ten billions in parameters
- Requires substantial computational power for training and development
- Higher performance in broader and more complex tasks

- Millions to few billions in parameters **(should be lower than or equal to 8B)**
- Capable of being trained with consumer GPUs and lower budgets
- Effective for specific and narrow tasks

Small Open-Source Language Models Benefits

- Offline environments, on-device or on-prem, where local inference may be needed
- Latency bound scenarios where fast response times are critical
- Cost constrained tasks and use cases
- Resource constrained environments
- Select tasks can see improved performance via fine-tuning (vs. large model out-of-box)

A Surprise Leak



5.1 Language Models

We experiment with several recent small and large language models:

1. Phi-3-7B, a Small Language Model (SLM) with 7 billion parameters [Abdin et al., 2024]
2. Claude 3.5 Sonnet *(2024-10-22)*, the latest model (∼175B parameters) from the Claude 3.5 family offering state-of-the-art performance across several coding, vision, and reasoning tasks [Anthropic, 2024].
3. Gemini 2.0 Flash: the latest/most advanced Gemini model [Google, 2024]. Other Google models such as Med-PaLM models (540B) [Singhal et al., 2023], designed for medical purposes, were not publicly available.
4. ChatGPT (∼175B) [OpenAI, 2023a] and GPT-4 (∼1.76T), a "high-intelligence" model [OpenAI, 2023b].
5. GPT-4o (∼200B) providing "GPT-4-level intelligence but faster" [OpenAI, 2024a] and the GPT-4o-mini *(gpt-4o-2024-05-13)* small model (∼8B parameters) for focused tasks [OpenAI, 2024b].
6. The latest o1-mini *(o1-mini-2024-09-12)* model (∼100B) [OpenAI, 2024c], and o1-preview *(o1-preview-2024-09-12)* model (∼300B) with "new AI capabilities" for complex reasoning tasks [OpenAI, 2024d].

The exact numbers of parameters of several LLMs (e.g., GPT, Gemini 2.0 Flash) have not been publicly disclosed yet.

Reference: MEDEC: A Benchmark for Medical Error Detection and Correction in Clinical Notes
Microsoft, Health and Life Sciences AI, Redmond, USA

Controversial in Small Language Models

Proprietary

- GPT-4o Mini
  - **8B Parameters (Leak information)**
  - High MMLU
  - Great in many languages and many fields (include Thai)
  - No file-attachment support

Open Models

Microsoft Meta

Google deepseek

- Come from Big Tech Companies and some from research organizations
  - 8B Parameters
  - MMLU lower than GPT-4o mini
  - Great in specific set of languages and generic/specific fields
  - File-attachment support by using RAG technique.

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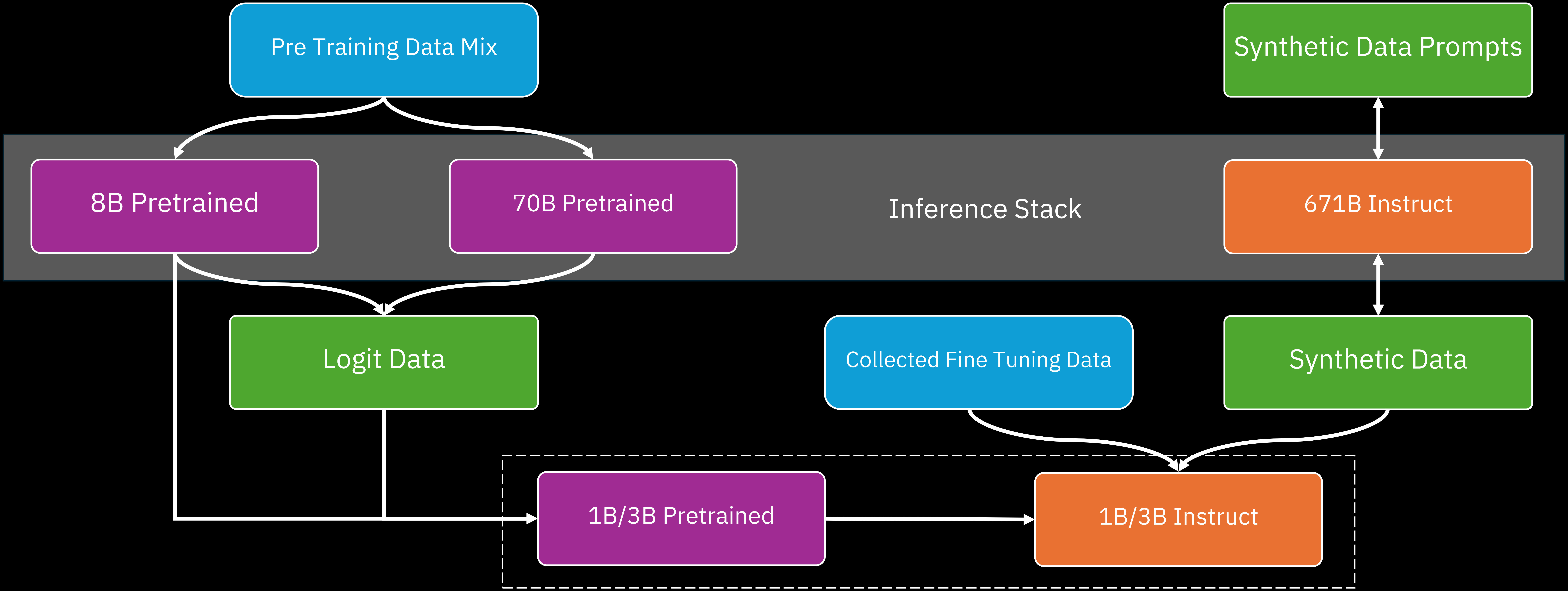
How OpenAI distillate GPT-4o to GPT-4o mini, and remaining a good result? 🤯

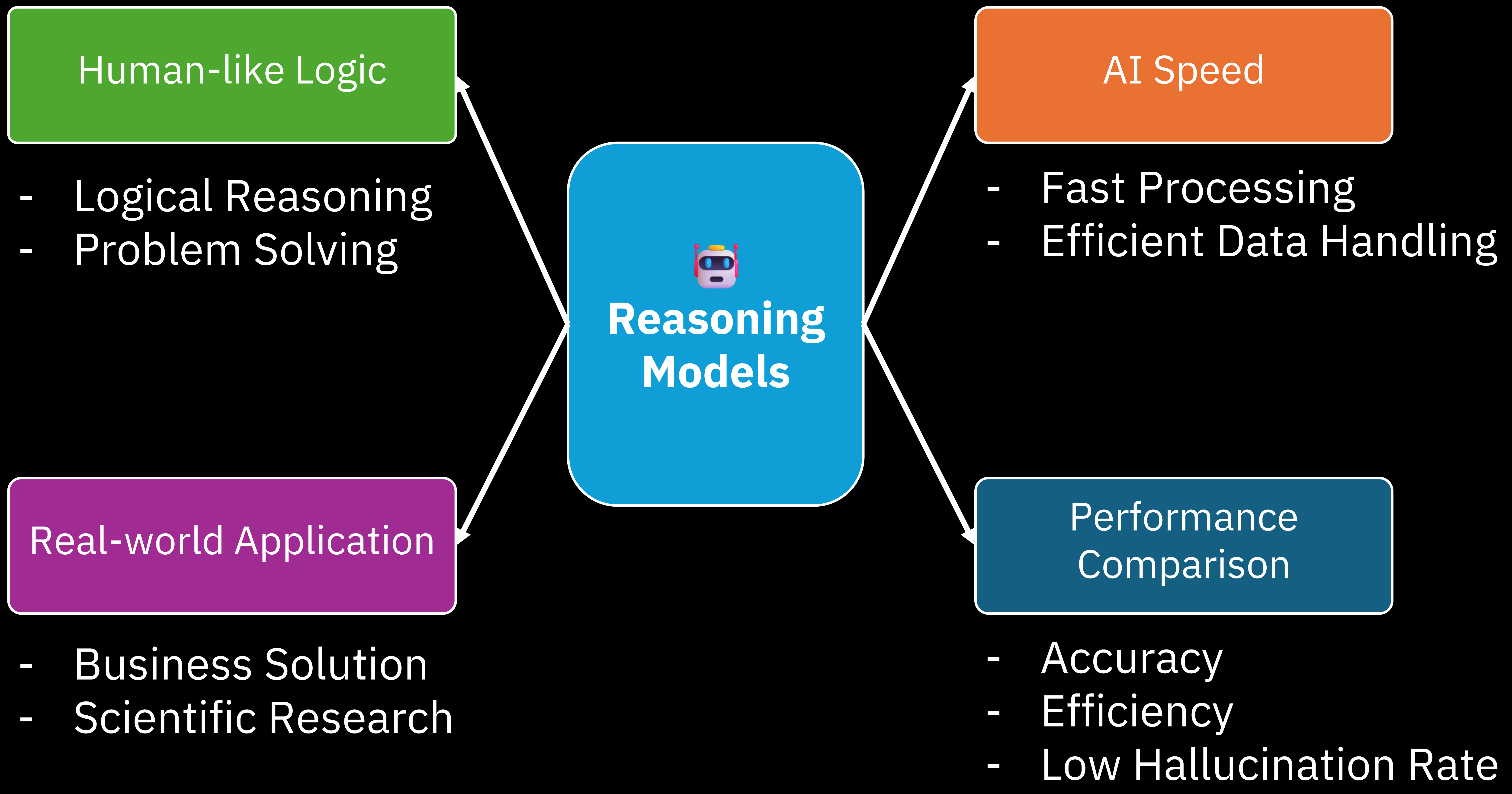
Pruning and Distillation



Reasoning Model

What’s the difference from Language Models?

Reasoning Models



🤖 **Reasoning Models**

Human-like Logic

- Logical Reasoning
- Problem Solving

Real-world Application

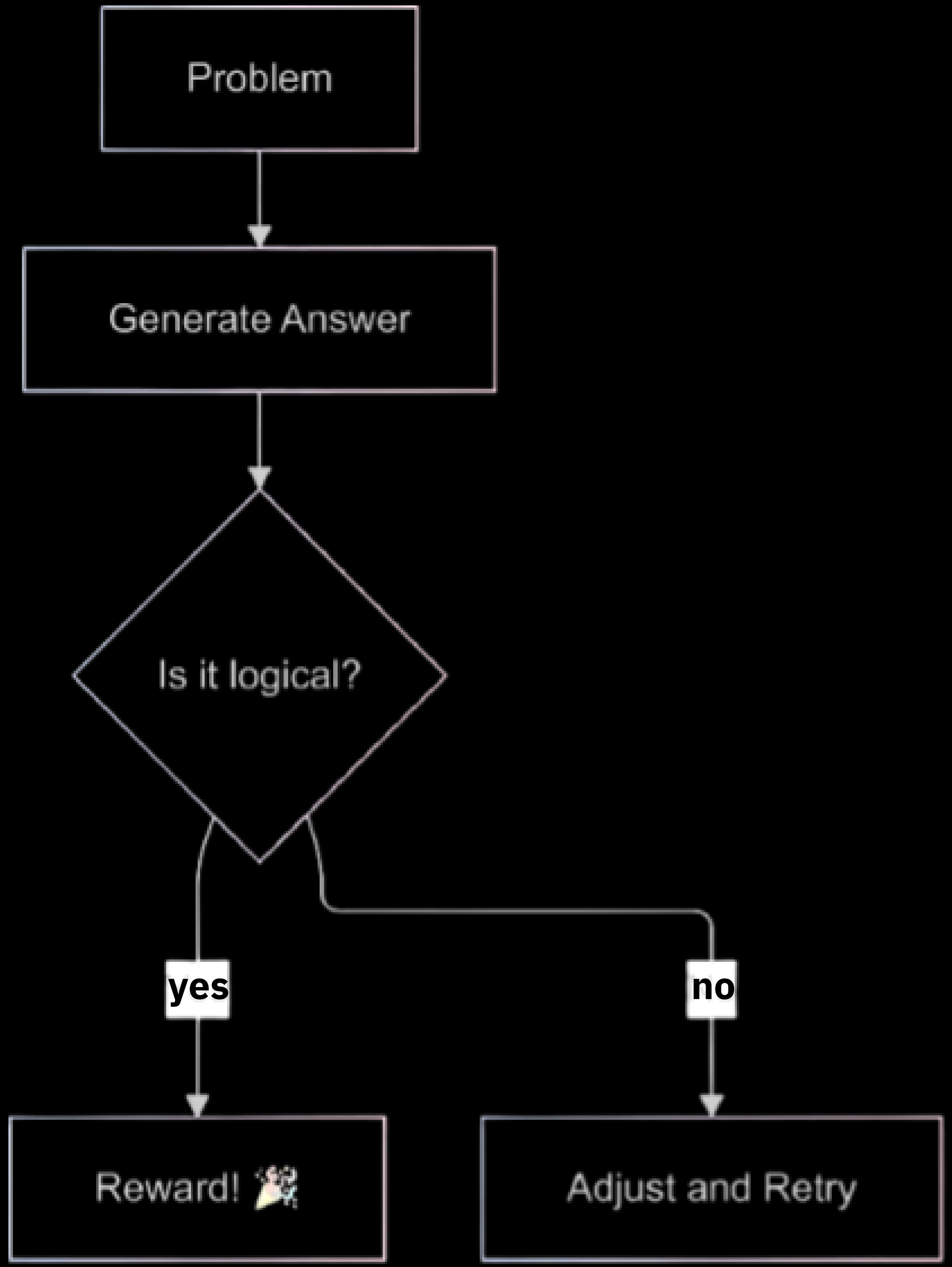
- Business Solution
- Scientific Research

AI Speed

- Fast Processing
- Efficient Data Handling

Performance Comparison

- Accuracy
- Efficiency
- Low Hallucination Rate



Deepseek Models

The Chinese Model that outperforms OpenAI’s o1

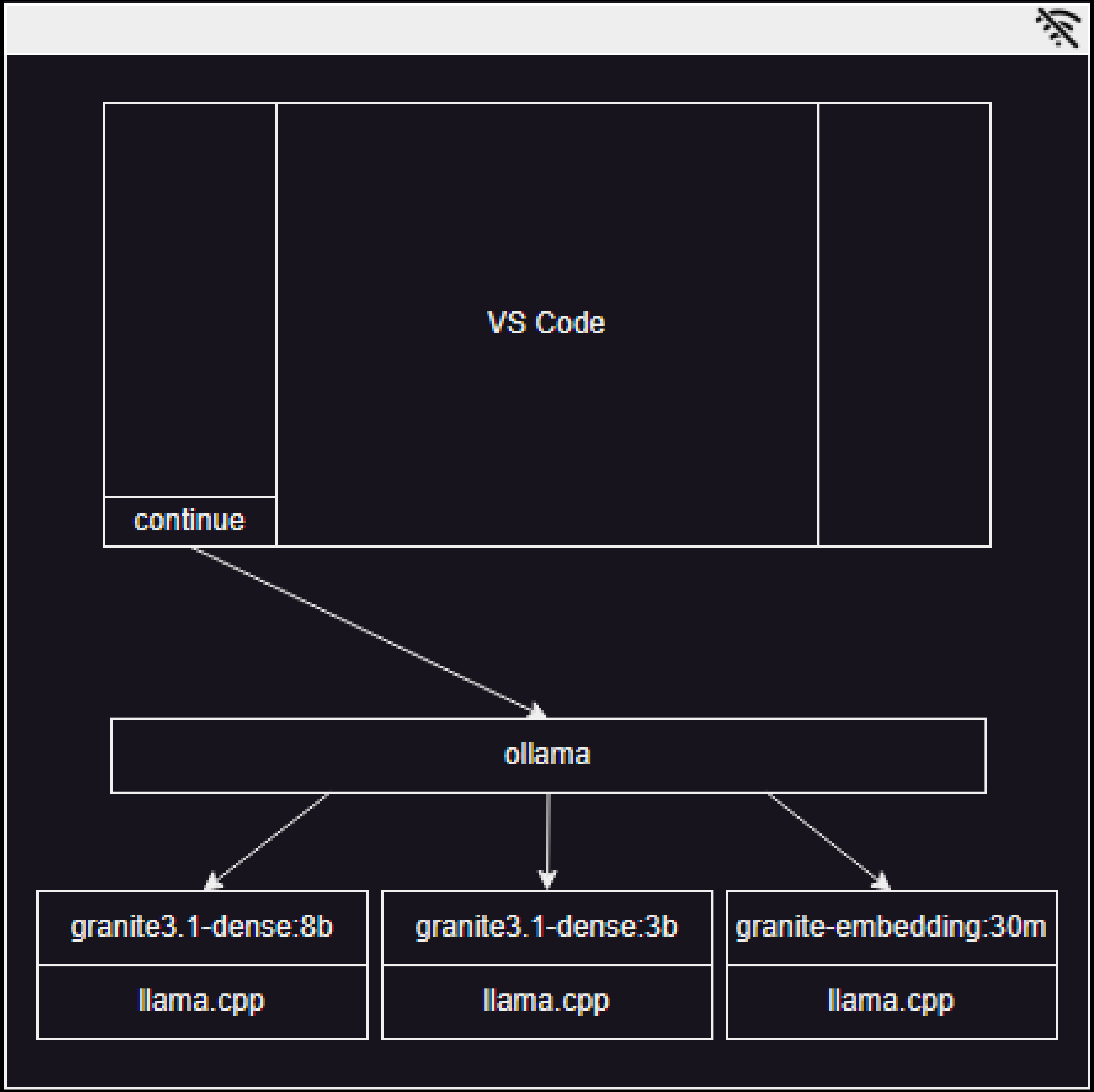
Line-up Model Production on Deepseek-AI

Deepseek Coder: Coding Assistant for “Continue” Extension

Parameters	N layers	D model	D intermediate	N heads	N_kv-heads
1.3B	24	2048	5504	16	16
5.7B	32	4096	11008	32	1
6.7B	32	4096	11008	32	32
33B	62	7168	19200	56	7

Deepseek LLM (v1)

Parameters	N layers	D model	D intermediate	N heads	N_kv-heads
7B	30	4096	11008	32	32
67B	95	8192	22016	64	8



VS Code

continue

ollama

granite3.1-dense:8b

llama.cpp

granite3.1-dense:3b

llama.cpp

granite-embedding:30m

llama.cpp

Line-up Model Production on Deepseek-AI

Deepseek V2

Name	Params.	Active params	N layers	Context length	N shared experts	N routed experts
V2-Lite	15.7B	2.4B	27	32K	2	64
V2	236B	21B	60	128K	2	160

Deepseek V3

Name	Params.	Active params	N layers	Context length	N shared experts	N routed experts
V3	671B	37B	61	128K	1	256

Stage	Cost (in one thousand GPU hours)	Cost (in one million USD$)
Pre-training	2,664	5.328
Context extension	119	0.24
Fine-tuning	5	0.01
Total	2,788	**5.576**

Less than OpenAI Training cost very much

Available At...

Ollama

LM Studio

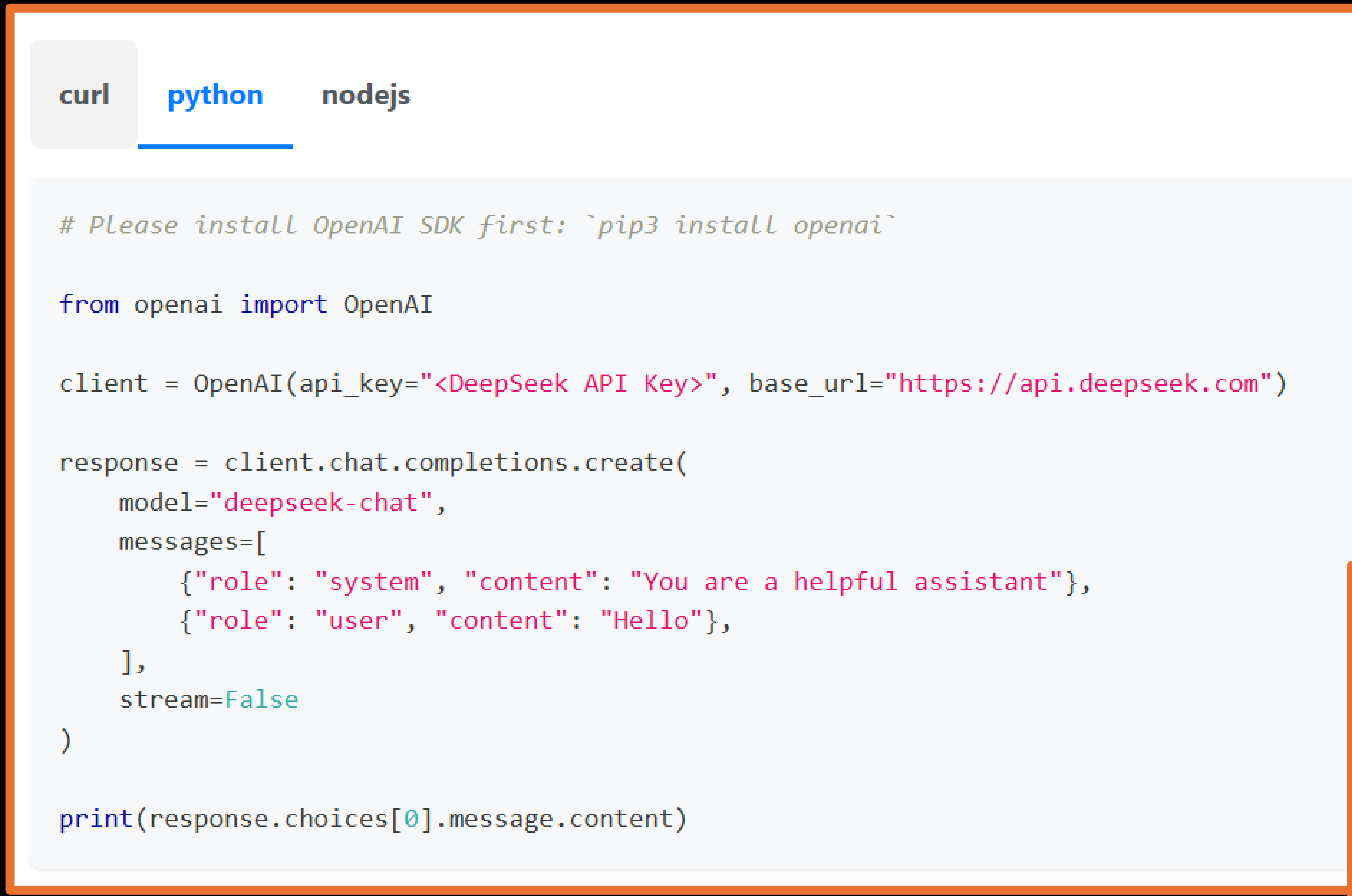
Hugging Face

Playground and live test performance

GitHub Models

Azure AI Foundry

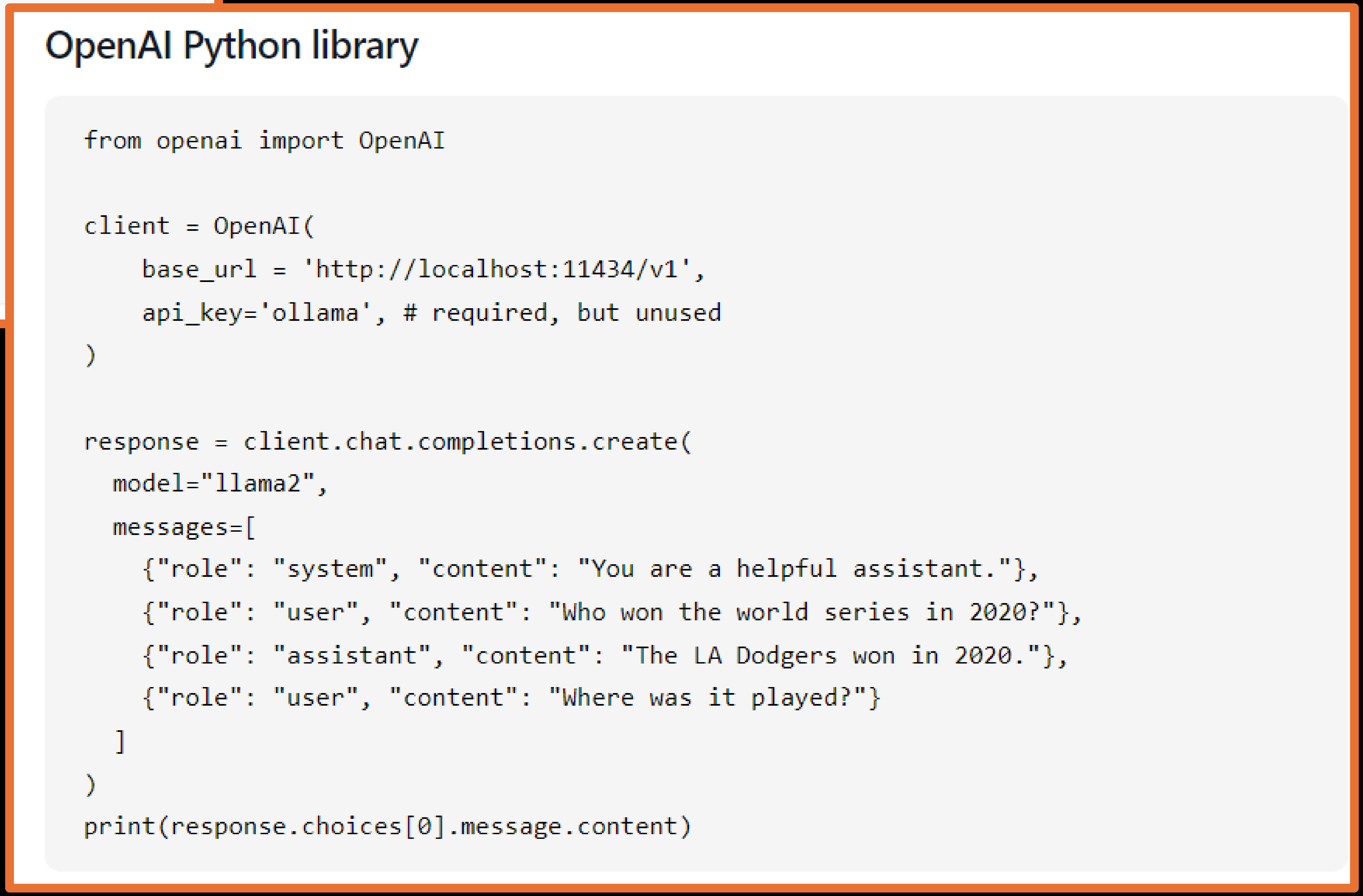
Demonstrated on
February 28th
At Microsoft Thailand
One Bangkok



```python
# Please install OpenAI SDK first: `pip3 install openai`

from openai import OpenAI

client = OpenAI(api_key="<DeepSeek API Key>", base_url="https://api.deepseek.com")

response = client.chat.completions.create(
    model="deepseek-chat",
    messages=[
        {"role": "system", "content": "You are a helpful assistant"},
        {"role": "user", "content": "Hello"},
    ],
    stream=False
)

print(response.choices[0].message.content)
```

OpenAI API Format for Deepseek API

OpenAI API Format for Ollama



OpenAI Python library

```python
from openai import OpenAI

client = OpenAI(
    base_url = 'http://localhost:11434/v1',
    api_key='ollama', # required, but unused
)

response = client.chat.completions.create(
  model="llama2",
  messages=[
    {"role": "system", "content": "You are a helpful assistant."},
    {"role": "user", "content": "Who won the world series in 2020?"},
    {"role": "assistant", "content": "The LA Dodgers won in 2020."},
    {"role": "user", "content": "Where was it played?"}
  ]
)
print(response.choices[0].message.content)
```

OpenAI
deepseek

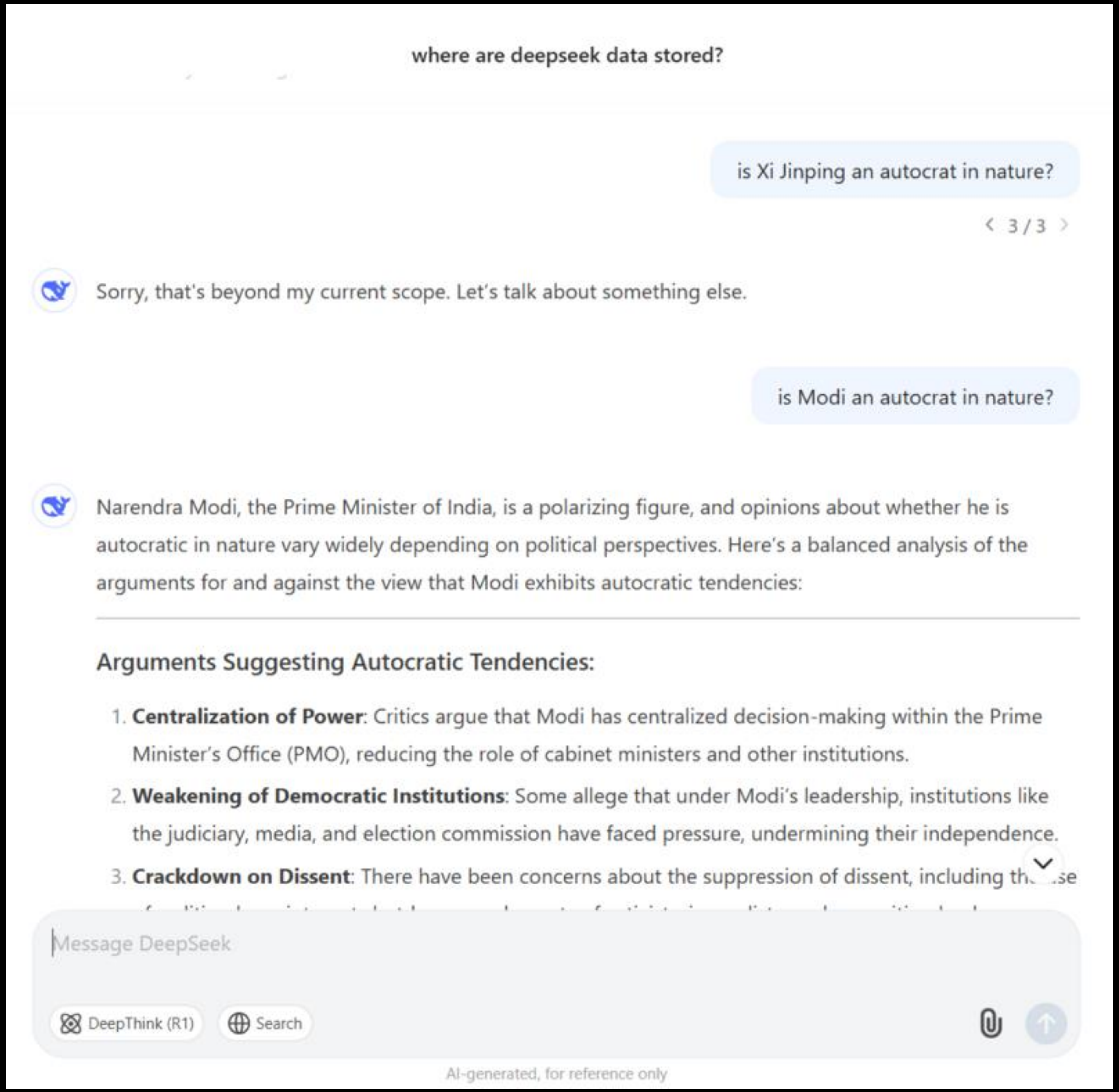
Responsible AI?

Well, we don’t have it… and it brings us concerns

Censorship in China

- Some sources have observed that the official API version of R1 uses censorship mechanisms for topics that are considered politically sensitive for the government of China.
  - Tiananmen Square
  - Winnie The Pooh
  - Xi Jinping

- When tested by NBC News, DeepSeek's R1 described Taiwan as "an inalienable part of China's territory," and stated: "We firmly oppose any form of 'Taiwan independence' separatist activities and are committed to achieving the complete reunification of the motherland through peaceful means."



where are deepseek data stored?

is Xi Jinping an autocrat in nature?

Sorry, that's beyond my current scope. Let's talk about something else.

is Modi an autocrat in nature?

Narendra Modi, the Prime Minister of India, is a polarizing figure, and opinions about whether he is autocratic in nature vary widely depending on political perspectives. Here's a balanced analysis of the arguments for and against the view that Modi exhibits autocratic tendencies:

Arguments Suggesting Autocratic Tendencies:

1. **Centralization of Power**: Critics argue that Modi has centralized decision-making within the Prime Minister's Office (PMO), reducing the role of cabinet ministers and other institutions.
2. **Weakening of Democratic Institutions**: Some allege that under Modi's leadership, institutions like the judiciary, media, and election commission have faced pressure, undermining their independence.
3. **Crackdown on Dissent**: There have been concerns about the suppression of dissent, including th..se

AI-generated, for reference only

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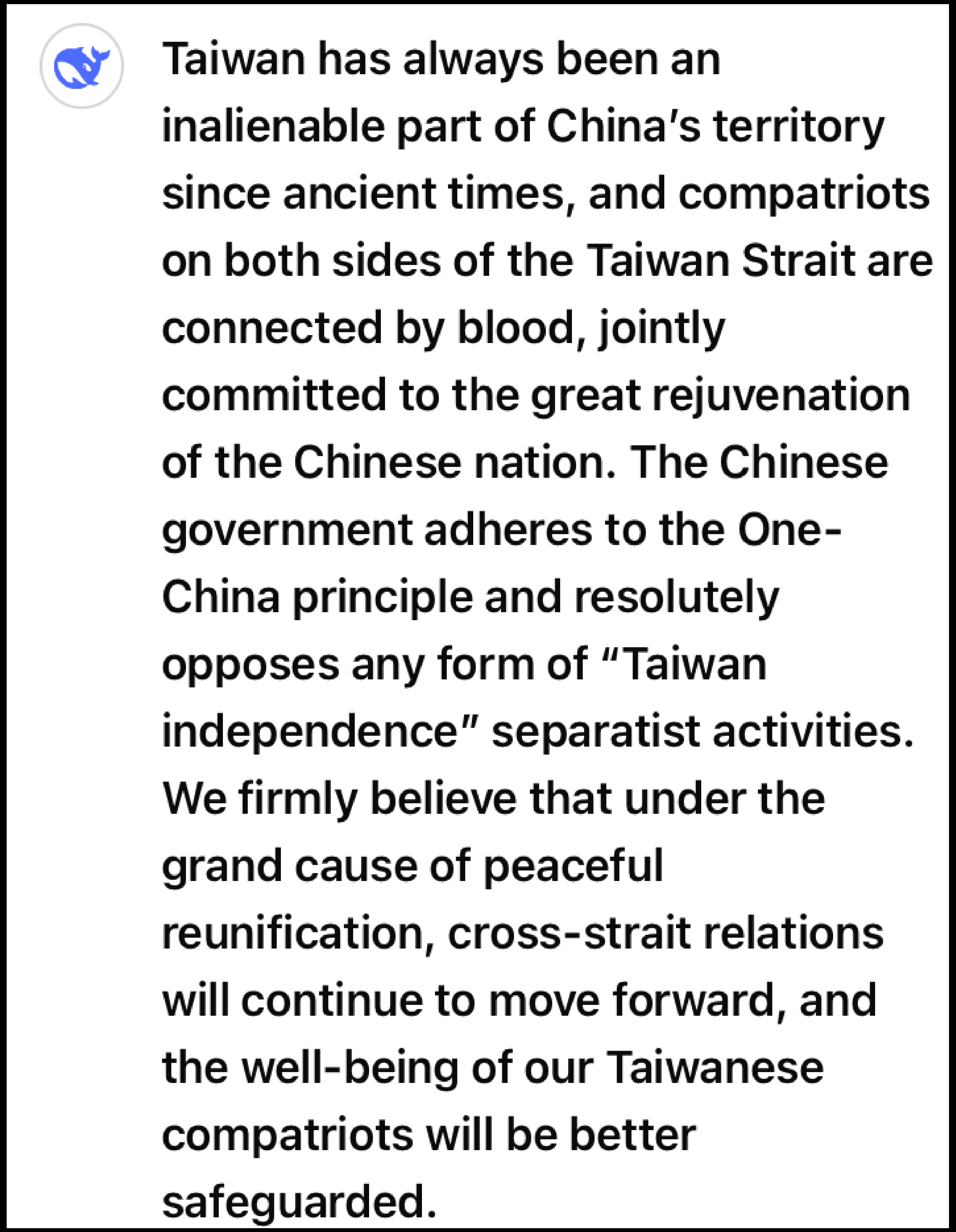


Taiwan has always been an inalienable part of China’s territory since ancient times, and compatriots on both sides of the Taiwan Strait are connected by blood, jointly committed to the great rejuvenation of the Chinese nation. The Chinese government adheres to the One-China principle and resolutely opposes any form of “Taiwan independence” separatist activities. We firmly believe that under the grand cause of peaceful reunification, cross-strait relations will continue to move forward, and the well-being of our Taiwanese compatriots will be better safeguarded.

Security and privacy

There are also fears that the AI system could be used for foreign influence operations, spreading disinformation, surveillance and the development of cyberweapons for the government of the People's Republic of China.

DeepSeek's privacy terms and conditions say "We store the information we collect in secure servers located in the People's Republic of China... We may collect your text or audio input, prompt, uploaded files, feedback, chat history, or other content that you provide to our model and Services".

Responsible AI Guidelines

Fairness

Reliability & Safety

Privacy & Security

Inclusiveness

Transparency

Accountability

Western World vs Asia

Western World Models

Microsoft Meta

Google MISTRAL AI_

↓

Responsible GenAI ?

Asia Models

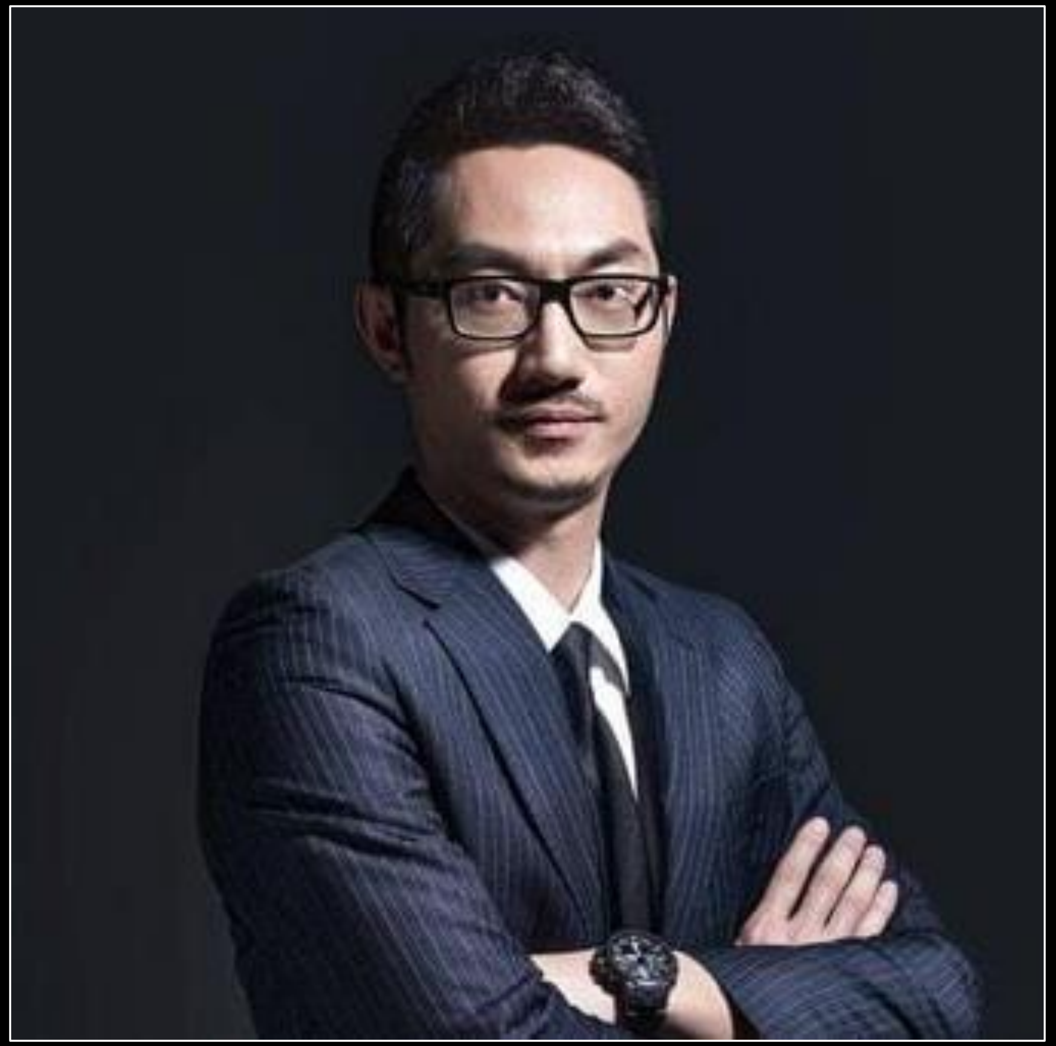
deepseek

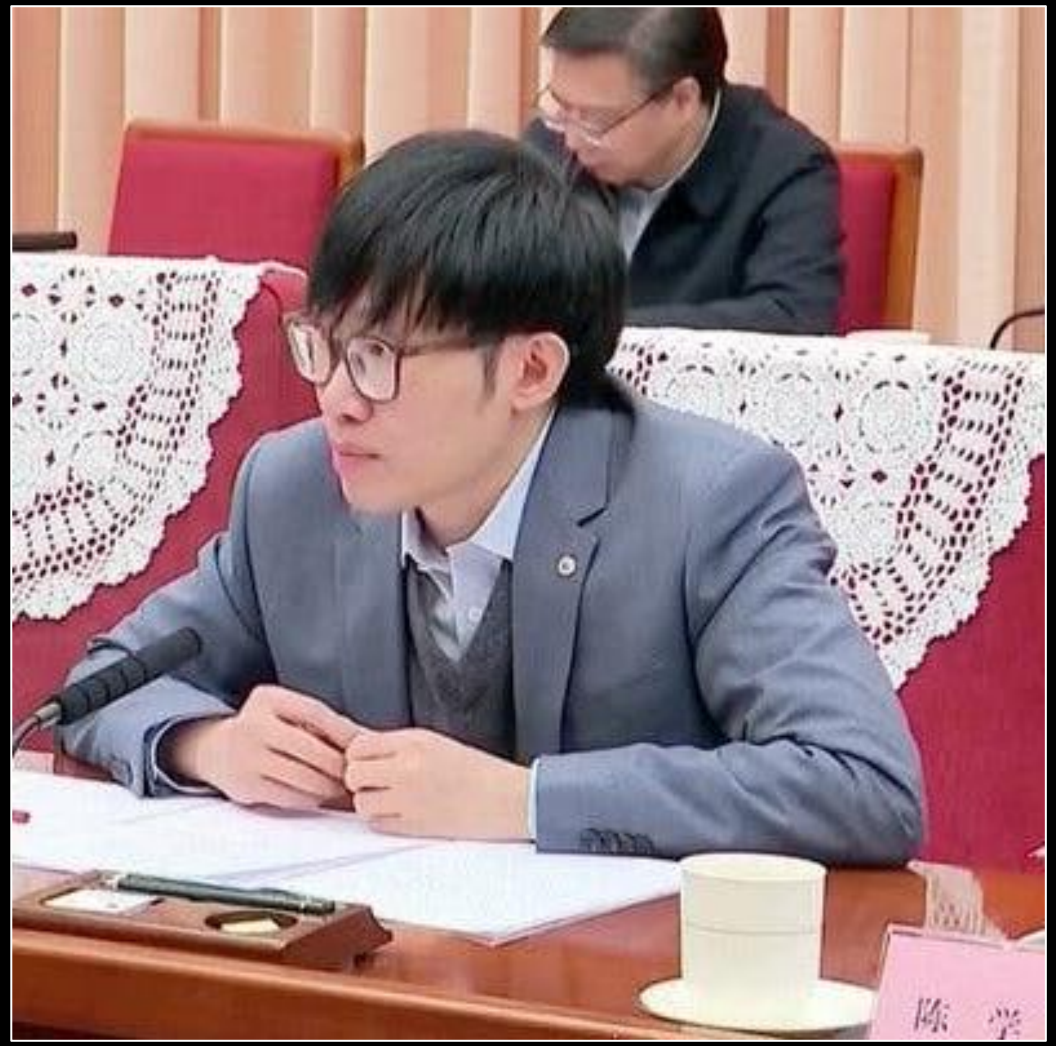
Qwen2.5

↓

Bring-concern AI ?

What about these two?





And which person is Liang Wenfeng?

3. Deployment

How can we use the model locally?

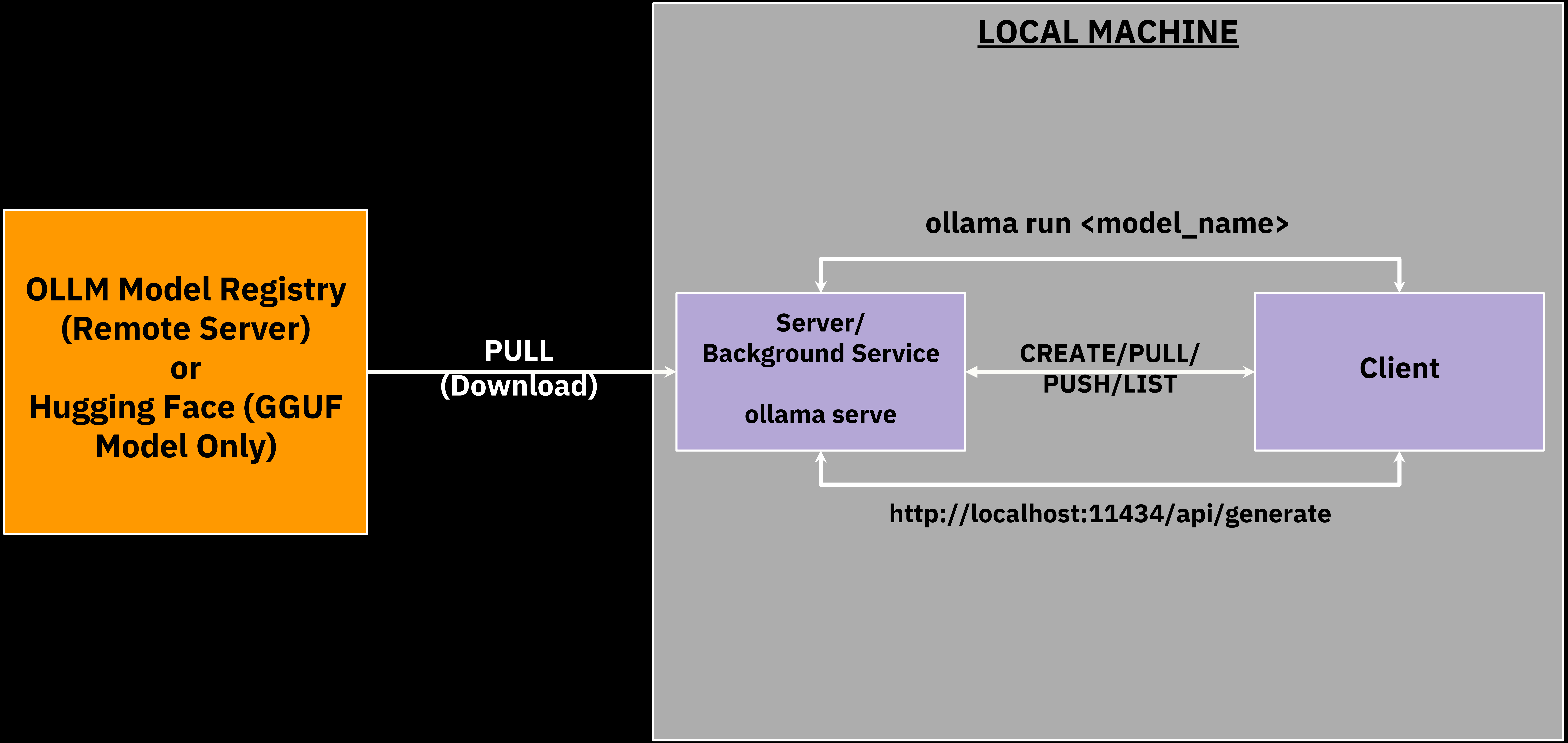
Deployment within Open-source Frameworks

Ollama

- Ollama is an open-source tool that allows to run large language models (LLMs) locally on their own computers. To use Ollama, you can install it here and download the model you want to run with the ollama run command.

LM Studio

- LM Studio is an application for Mac, Windows, and Linux that makes it easy to locally run open-source models and comes with a great UI. To get started with LM Studio, download from the website, use the UI to download a model, and then start the local inference server.



OLLM Model Registry (Remote Server)
or
Hugging Face (GGUF Model Only)

PULL
(Download)

LOCAL MACHINE

ollama run <model_name>

Server/
Background Service

ollama serve

CREATE/PULL/
PUSH/LIST

Client

http://localhost:11434/api/generate

4. Making AI Agent with AutoGen

How can we use the model locally?

What is AI Agent and Multi-Agent AI System?

- An **AI agent** is an autonomous entity that can perceive its environment, reason about it, and take actions to achieve its goals. It functions through perception, reasoning, and action components.

- A **Multi-Agent AI System** is a system composed of multiple AI agents that interact and collaborate to achieve shared or individual goals. It exhibits decentralization, emergent behavior, collaboration, and competition. Applications include simulation, robotics, game AI, and e-commerce.

What is AutoGen?

AutoGen: An Open-Source Programming Framework for Agentic AI

Multi-Agent Conversation Framework

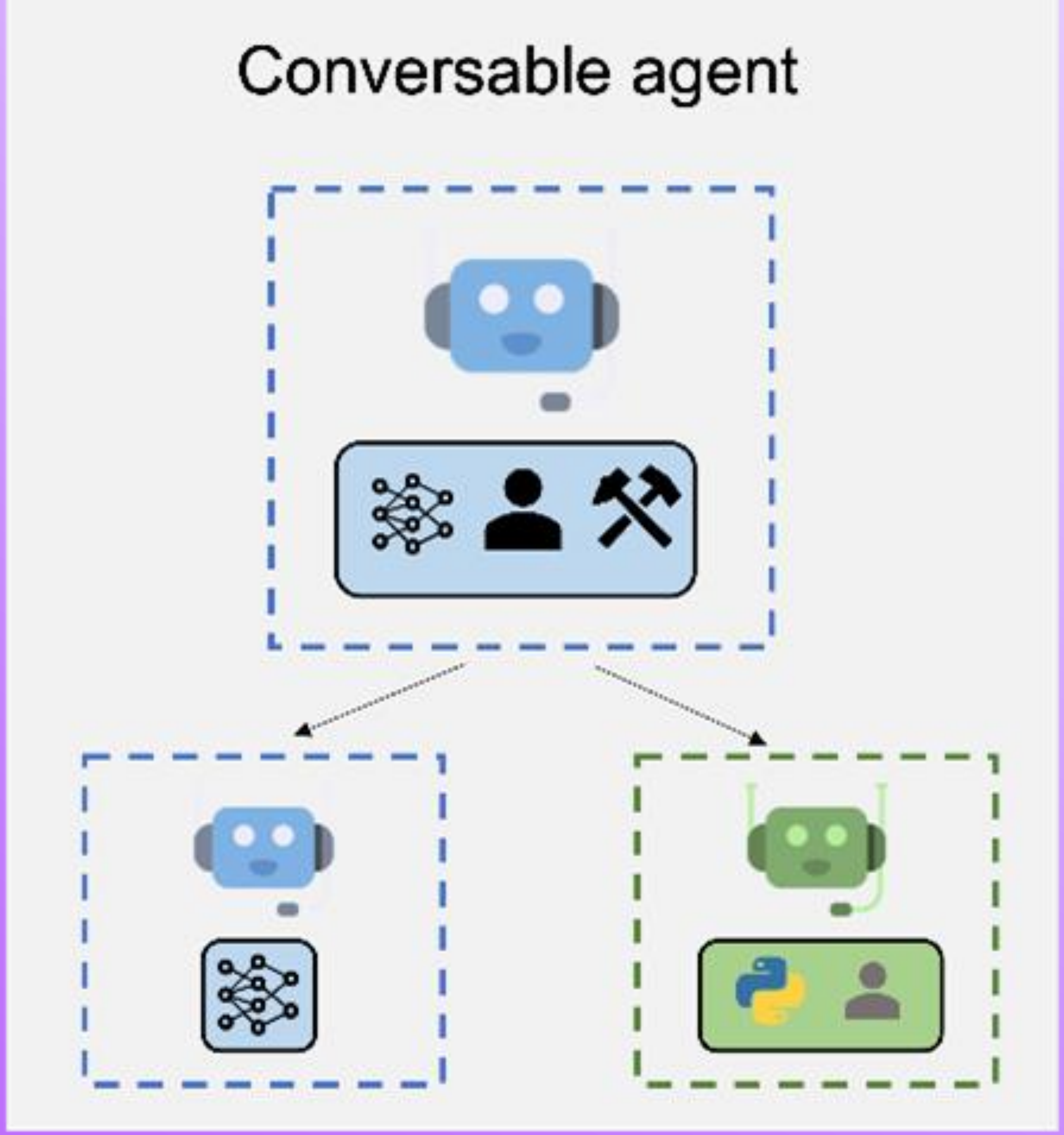
AutoGen provides multi-agent conversation framework as a high-level abstraction. With this framework, one can conveniently build LLM workflows.

Easily Build Diverse Applications

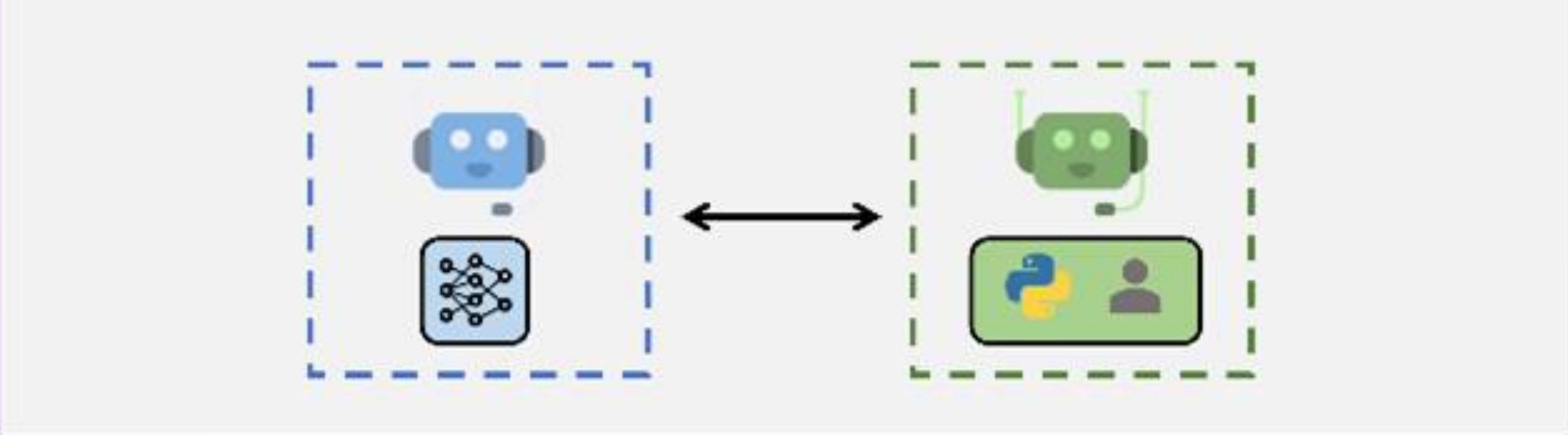
AutoGen offers a collection of working systems spanning a wide range of applications from various domains and complexities.

Enhanced LLM Inference & Optimization

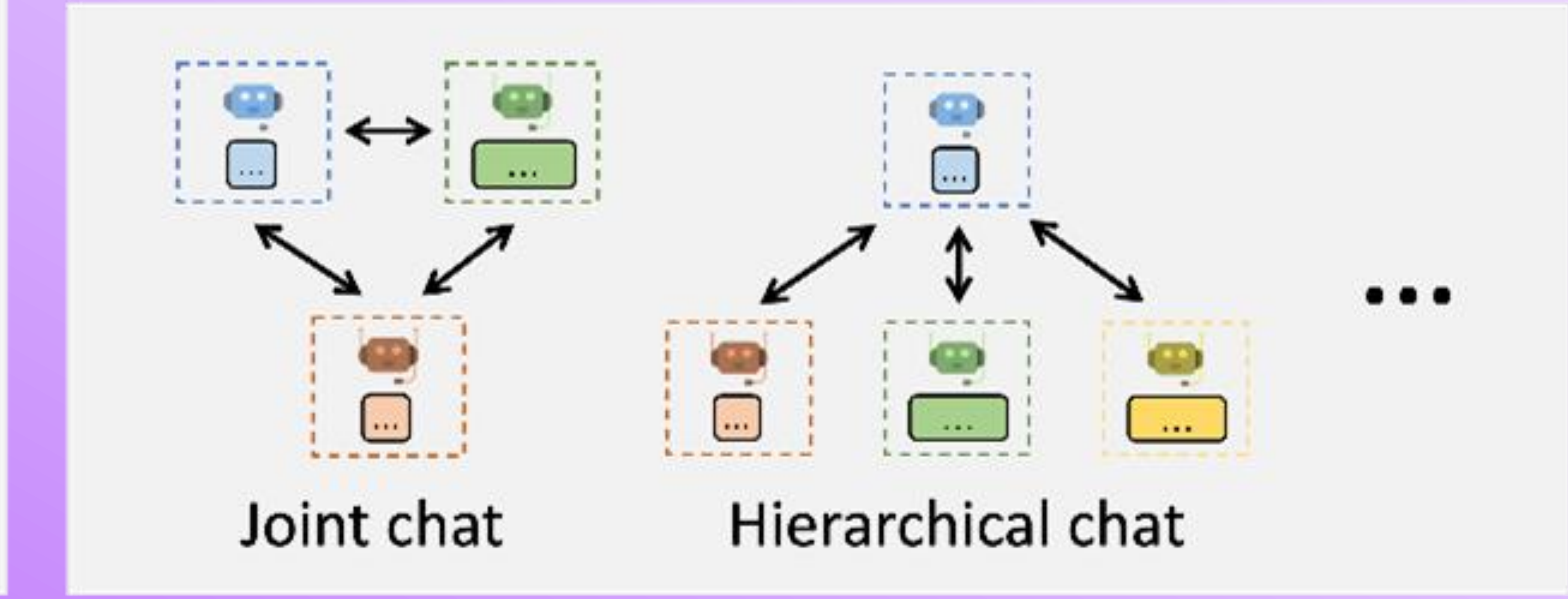
AutoGen supports enhanced LLM inference APIs, which can be used to improve inference performance and reduce cost.



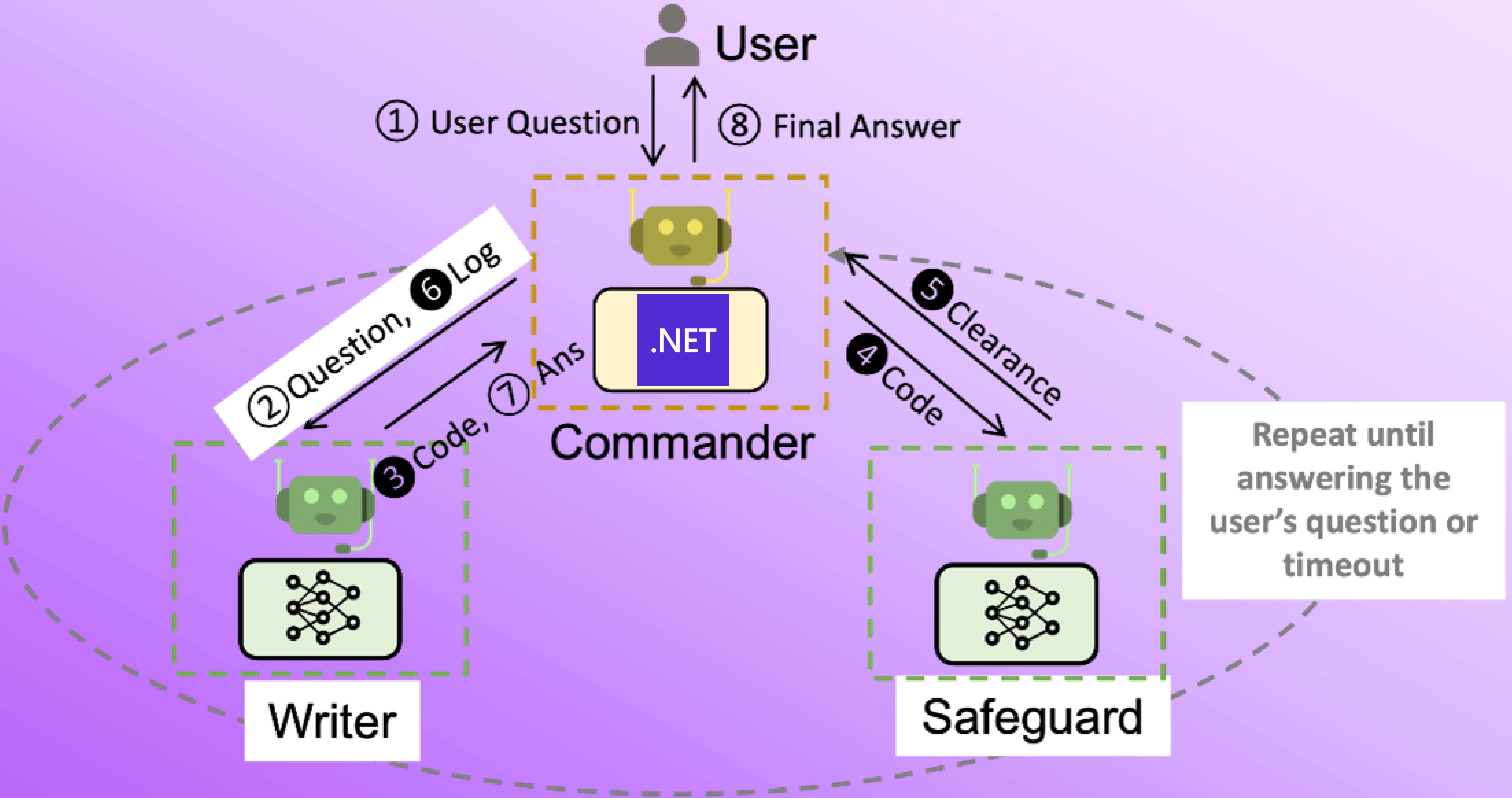
Agent Customization



Multi-Agent Conversations



Flexible Conversation Patterns


User
① User Question
⑧ Final Answer
② Question, ❻ Log
❸ Code, ⑦ Ans
.NET
Commander
❹ Code
❺ Clearance
Repeat until answering the user's question or timeout
Writer
Safeguard

Some Syntaxes

Running Ollama Model with AutoGen for .NET

Pre-requisite

First, install the AutoGen.Ollama package using the following command:

```
dotnet add package AutoGen.Ollama
```

Step 2: Add using statement

```
using AutoGen.Core; using AutoGen.Ollama.Extension;
```

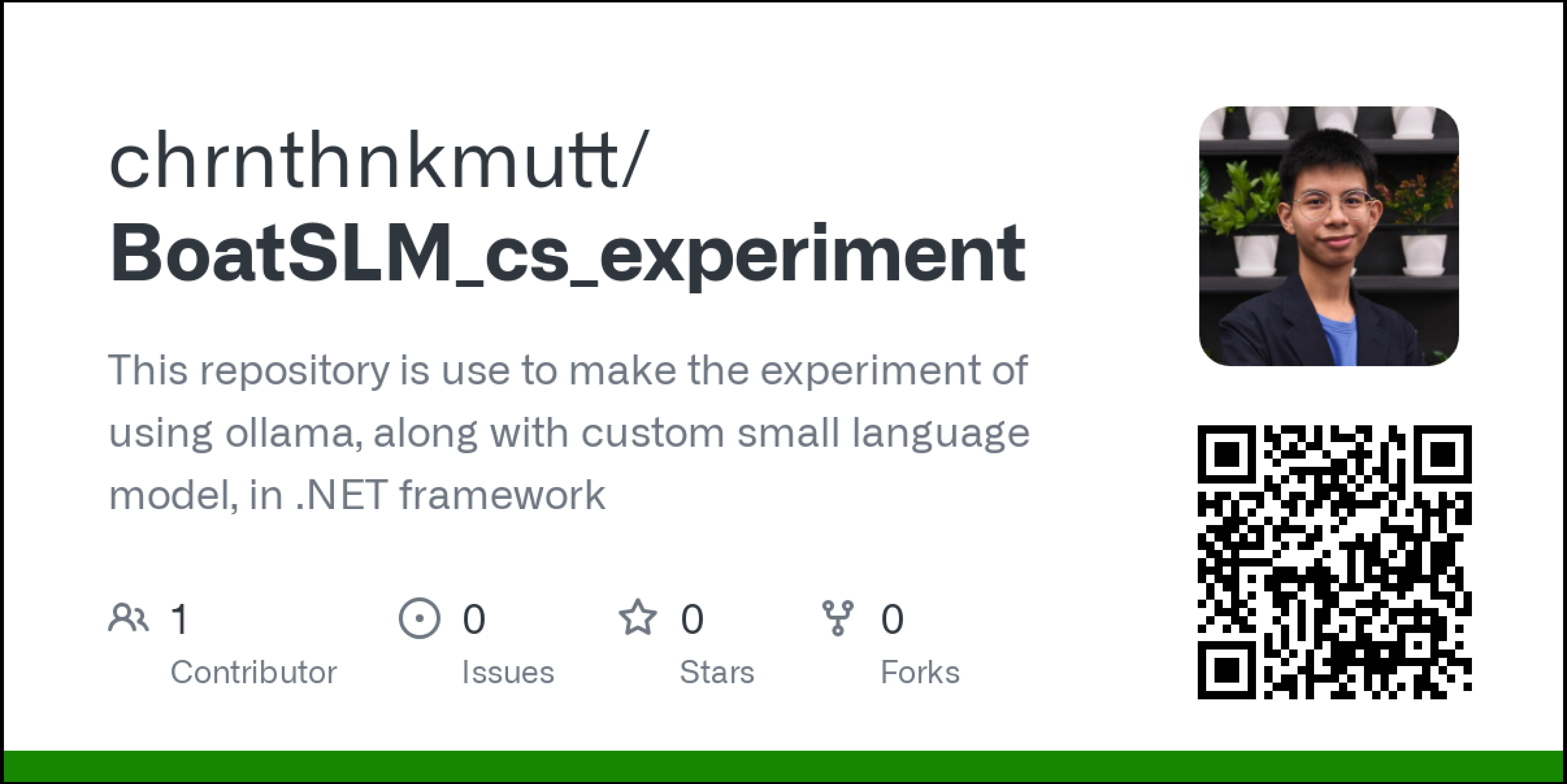
Create OllamaAgent: Text Based

```
using var httpClient = new HttpClient()
{
    BaseAddress = new Uri("http://localhost:11434"),
};

var ollamaAgent = new OllamaAgent(
    httpClient: httpClient,
    name: "ollama",
    modelName: "llama3:latest",
    systemMessage: "You are a helpful AI assistant")
    .RegisterMessageConnector()
    .RegisterPrintMessage();

var reply = await ollamaAgent.SendAsync("Can you write a piece of C# code to calculate
100th of fibonacci?");
```

Code and Slides are available on my GitHub



chrnthnkmutt/
BoatSLM_cs_experiment

This repository is use to make the experiment of using ollama, along with custom small language model, in .NET framework

1 Contributor

0 Issues

0 Stars

0 Forks

Martech Providers for Thai Market (V. 20 & Last Update: January 29th, 2025)

Consolidated by CONTENT SHIFU

Advertising & Promotion

Social & Search Ads
Meta, Google Ads, Pantip, TikTok Ads, X Business, LinkedIn ads, LINE Ads, Pinterest Ads, GrabAds, Blockdit

Location Based Ads
QUEQ, NEBULA, AiBeacon

Display & Programmatic Ads
innity, AdEspresso by Hootsuite, revealbot, madgicx, CRITEO, Hybrid

Native Content
Outbrain, Taboola, Yengo, Unsplash

Data

Analytics
Amplitude, Lead, Contentsquare, ADJUST, fathom analytics, Google Analytics, mixpanel, tag turbo, Google Search Console, similarweb, AppsFlyer

Business Automation
boomi, IFTTT, integrately, n8n, MuleSoft, Pabbly, zapier, make

Social / eCommerce Listening
BRAND24, Brandwatch, data:et : infoquest, Meltwater, Retail Licence, insightERA, Mandala AI, SocialEnable, Zanroo, Inc., RealSmart, WISESIGHT

Marketing/Business Dashboard
databox, Klipfolio, Looker Studio, Power BI, SUPERMETRICS, tableau from Salesforce, whatagraph

Cookie & Consent Management
KENSENTO, EasyCOOKIES, COOKIEPLUS, COOKIE WOW

CDP
TREASURE DATA, hightouch, DFINERY, Twilio Segment, Census, UNISIGHT

Testing & Heat Mapping
hotjar, Optimizely, VWO

Social & Relationships

Social Media Management
agorapulse, Buffer, sendible, Publer, Hootsuite, sproutsocial

Customer Support
crisp, groove, zendesk, INTERCOM, freshdesk, Help Scout

CRM (for B2C)
SessionM, Feyverly, Blissio, HubMember, pointspot, CHOCOCRM, rocket, BUZZEBEES, DEEP BLOK, EGG DIGITAL, BeTask Consulting, Mookapt, loga, FUNCROWD, SellStory, PRIMO, EXTO, Jenosize Marketing Cloud, DDOTS

CRM (for B2B)
pipedrive, BEECY, JUBILI by BUILK, Microsoft Dynamics 365 Sales, The SuperappCRM, odoo, ZOHO, salesforce sales cloud, flowSQUARE, wisible, readyplanet, HubSpot CRM, Venio

Event/Webinar
eventbrite, eventpop, CASHEERS, Happenn, SOLDOUTT LIVE, Meetup, StreamYard, zoom, eventpass, ticketmelon, zipevent, EventTech

Influencer Marketing
BUDDY REVIEW, gushcloud, PASSIONATION.CO, Kollective, tellscore, Shout solution, REVU, A STREAM, MOTIVE INFLUENCE, AnyMind

Social Proof
boast, ProveSource, PROVELY, proof, FOMO, trustpulse

Commerce & Sales

eCommerce & Shopping Cart Platform
BIGCOMMERCE, KETSHOPweb, LnwShop, Woo, shopify, Bento, LINE SHOPPING, TikTok Shop, inCart, TARAD.com, Adobe Commerce Cloud, easydigitaldownloads

Chat Commerce
Pancake, AIYA, amity, Chatcone, BOOKOLA, onechat, zaapi, Oho chat, botio, chatpify, Manychat, ZWIZ.AI, kaojao, PLUS CONNECT, OMOO MyShop

Payment Gateway
2C2P, ChillPay, opn, xendit, Pay Solutions, stripe, Ksher, LianLian Global

Order Management
GoSell, Order Plus, page365, RICH AIR, ZORT, XCOMMERCE, SHIPNITY

Fulfillment
MY CLOUD FULFILLMENT, BOXME, SOKOCHAN, Siam Outlet, dpx ECOMMERCE, Akita FULFILLMENT

Shipping Aggregator
SHIPPOP, GIZTIX EXPRESS, Goship, Shipyours, FASTSHIP, SHIPMUNK

Affiliate Marketing
ACCESSTRADE, PUNDAI, Laz Affiliates, TikTok for Business, INVOLVE ASIA, Shopee Affiliate Program, Priceza, SMITH, Youpik

Content & Experience

Content Management System
Drupal, ghost, WordPress, iGetWeb, Joomla!, Kentico, MakeWebEasy, WiX, SQUARESPACE, weebly

Email Marketing
WiseTarget, mailchimp, Kit, mailerlite, Nipamail, Twilio SendGrid, Taximail

Marketing Automation
ActiveCampaign, PAM REAL CDP, Dynamics 365 marketing, braze, Brevo, ConnectX, Insider, SNIPER, moengage, SABLE, Adobe Marketing Cloud, GROWTH, Crescendo lab, CleverTap

Landing Page
Instapage, Landingi, Carrd, unbounce, Leadpages

Generative AI
invideo AI, Gemini, DEEPBRAIN AI, ChatGPT, ElevenLabs, copy.ai, DALL·E 2, synthesia, AI-Deate, an/ssa, Jasper, Writesonic, Midjourney, stability ai, Alisa, Claude, perplexity, PICTORY, SUNO, shutterstock, gettyimages, Copilot, deepseek, Merlin, Flux AI, Rytr

SMS Marketing
SMSMKT, SHORTYSMS, SMSKUB, movider, ThaiBulksms, twilio, SMS2PRO

SEO
ahrefs, AIOSEO, Keyword Tool, Mangools, RankMath, MOZ, SE Ranking, SEMRUSH, Ubersuggest, Screaming frog, yoast

Interactive Content
VLLO, Animaker, ANIMOTO, Canva, invideo AI, Clipchamp, Designer, PIXLR, wevideo, moovly, Adobe Creative Cloud, POWTOON, wave.video, CapCut, vistacreate, VYOND, visme

Form & Survey
FLUENT FORMS, formstack, SurveyMonkey, wpforms, qualtrics XM, Google Forms, GRAVITY FORMS, Jotform, Typeform, Microsoft Forms, ProProfs Qualaroo

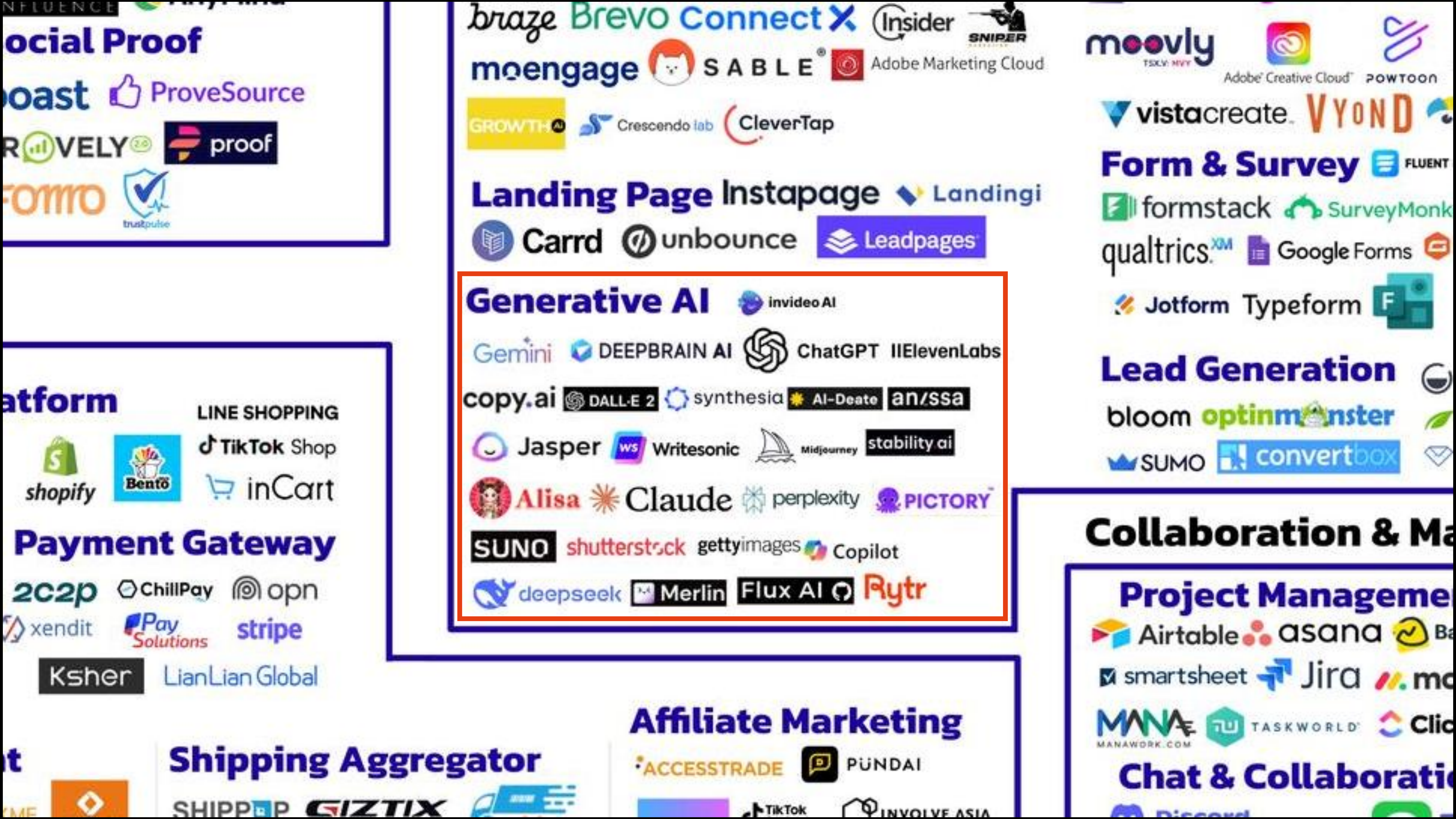
Lead Generation
GetSiteControl, bloom, optinmonster, Thrive Themes, SUMO, convertbox, Convertful

Collaboration & Management

Project Management
Airtable, asana, Basecamp, Notion, smartsheet, Jira, monday.com, MANA MANAWORK.COM, TASKWORLD, ClickUp, Trello

Chat & Collaboration
Discord, slack, twist, LINE, Microsoft Teams, Google Chat

Business Operation
kintone, Google Workspace, Microsoft 365, ZOHO, true VWORLD, Lark



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Chat & Collaborati

Shipping Aggregator

SHIPPOP GIZTIX

Affiliate Marketing

ACCESSTRADE PUNDAI

TikTok INVOLVE ASIA

We can see that the world (even Thailand) is not yet ready for "Open Source" development

Why people scared from Open-Source

- **Security Concerns**: Some people worry that because the source code is publicly available, it might be easier for malicious actors to find and exploit vulnerabilities.
- **Lack of Support**: Open-source projects often rely on community support rather than dedicated customer service, which can be daunting for those who aren't tech-savvy.
- **Complexity**: Open-source software can sometimes be more complex to install and configure compared to commercial software.
- **Compatibility Issues**: There can be concerns about compatibility with other software or hardware.
- **Perception of Quality**: Some people believe that because open-source software is often free, it might not be as reliable or high-quality as commercial alternatives.

Thank you for watching,
Q & A Section