

Generative AI in Finance

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How Popular is Generative AI?



54 months



42 months



30 months



9 months



2 months

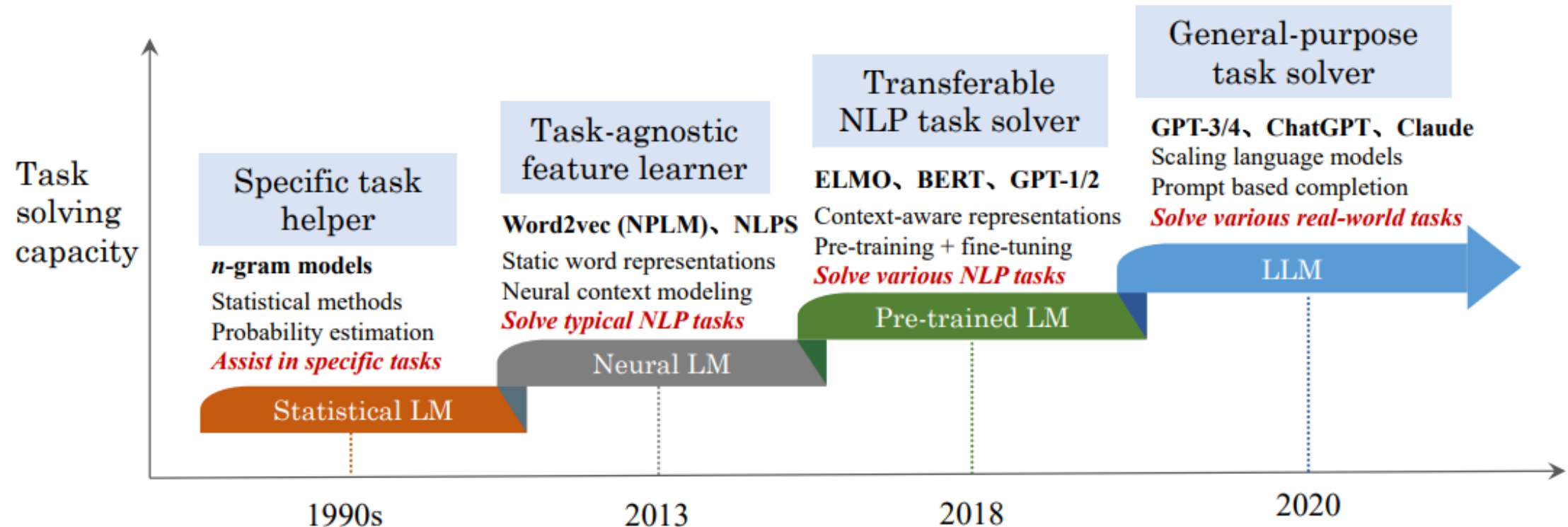
At its peak in April 2024, the site was receiving nearly **2 billion** visits each month.

What is Generative AI?

ChatGPT 4o's answer

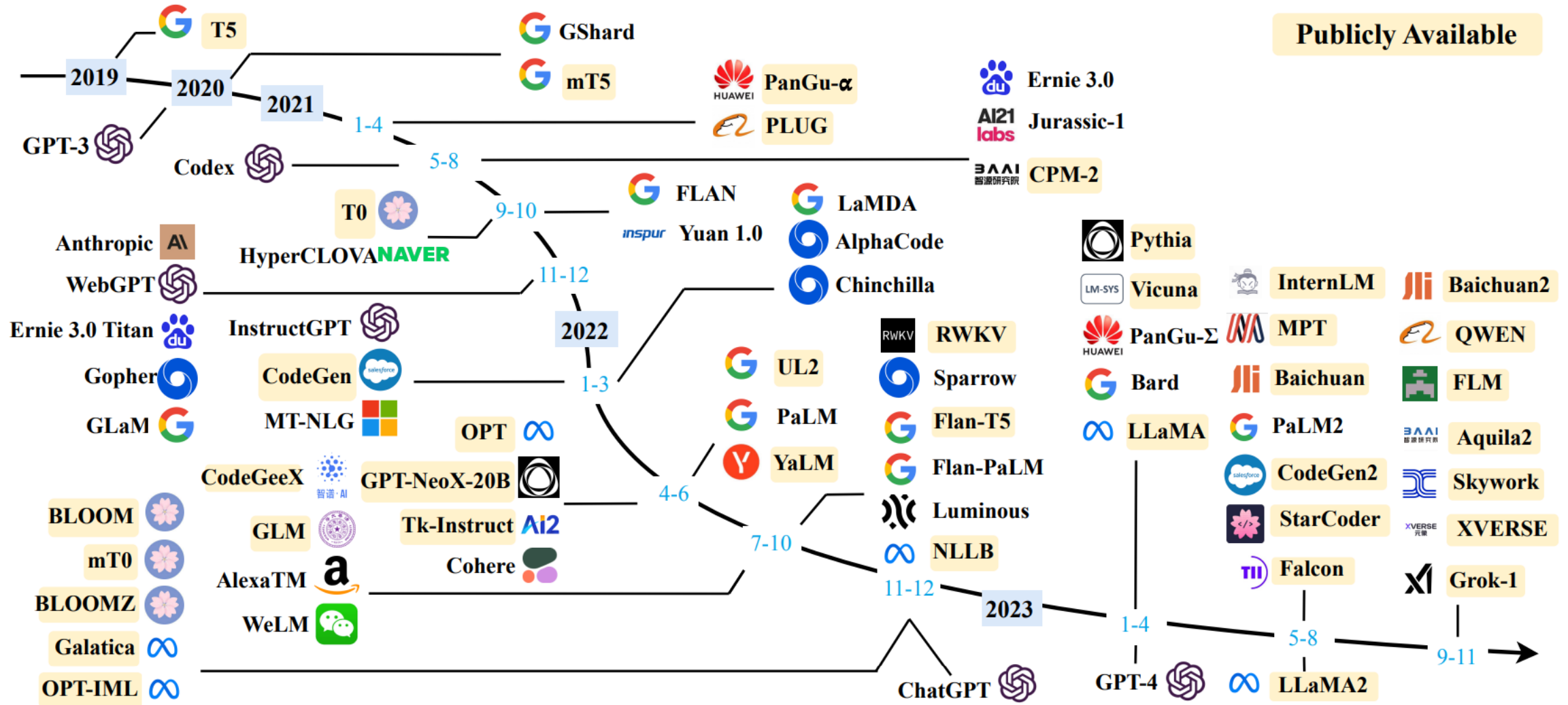
- Generative AI refers to artificial intelligence systems that **create new content**, such as **text, images, music, or videos**, by learning from large datasets and understanding patterns within them.
- Unlike traditional AI, which focuses on recognizing patterns or making decisions, generative AI **produces novel outputs that resemble the data it was trained on**.
- Examples include Generative Adversarial Networks (**GANs**) and transformer-based models like **GPT**, which are used in applications ranging from content creation and art to product design and healthcare.

The Evolution of Language Models



Four generations of language models from the perspective of task-solving capacity.

Timeline of Large Language Models



Existing Financial Applications of Generative AI

- Financial text analysis
- Financial robo-advisors
- Financial auditing
- Financial regulatory interpretation
- Financial budgeting
- Financial risk management
- Financial text summarization
- Financial text translation
- Stock movement prediction
- Synthetic financial data generation

Using General-Purpose LLMs for Financial Applications

General-purpose LLMs

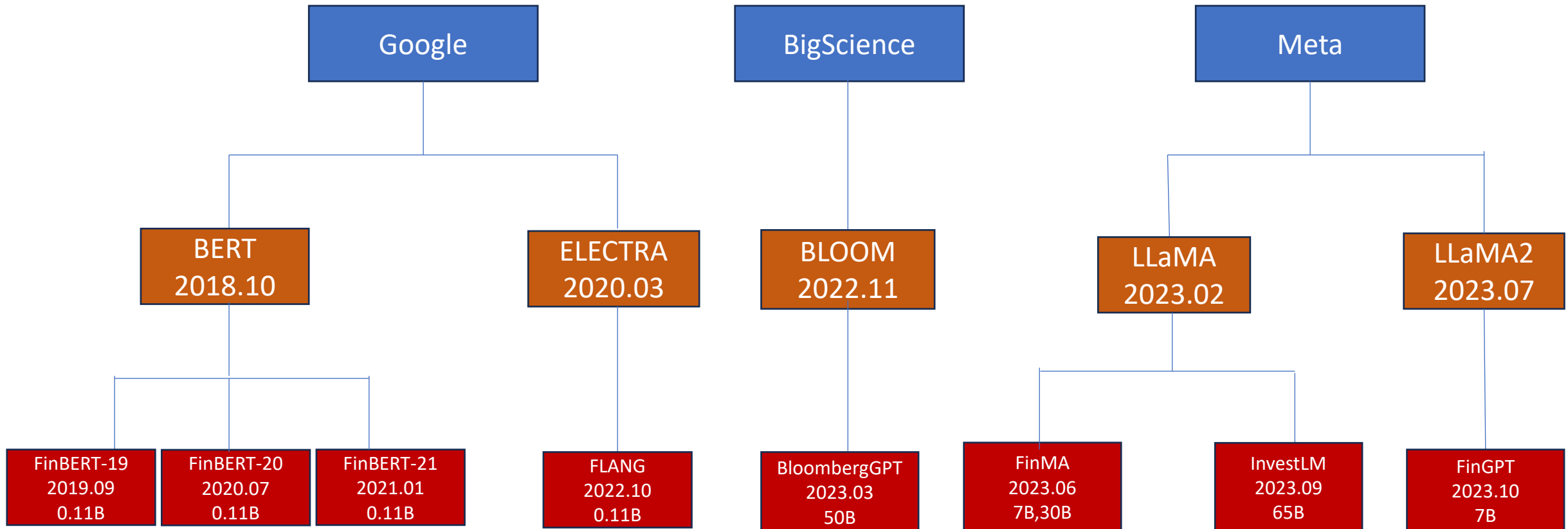
- ChatGPT, Gemini, Claude,...
- Easy to use
- No additional development cost
- Perform well on general tasks
- May not perform well on domain-specific tasks
- Data privacy

Using Finance-Specific LLMs for Financial Applications

Finance-specific LLMs

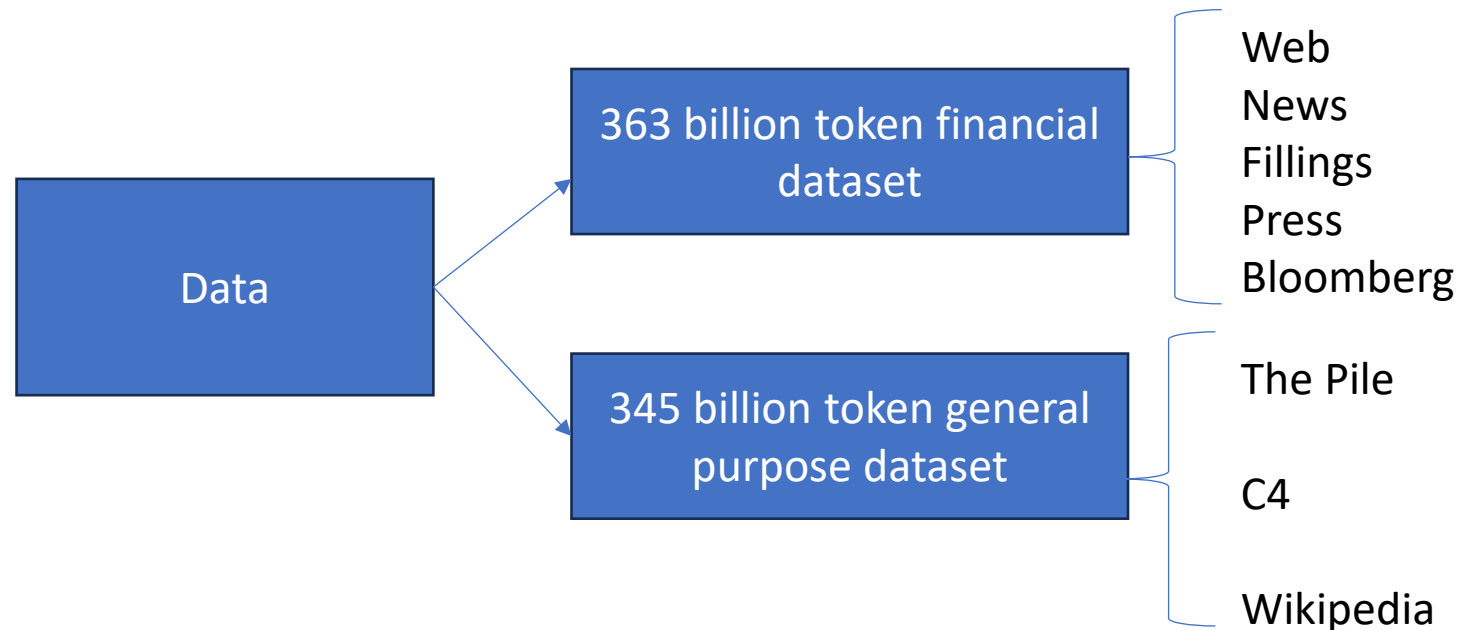
- BloombergGPT, FinMA, FinGPT, ...
- Need to explore how to use them
- Need further update the LLMs with financial datasets (additional training or finetuning)
- Better performance on domain-specific task
- May perform worse on other tasks

Timeline of Financial LLMs



BloombergGPT: A Specialized Financial LLM

- It is a **50 billion** parameter language model that is trained on a wide range of **financial data**.
- The **mixed dataset training** leads to a model that outperforms existing models on financial tasks by significant margins without sacrificing performance on general LLM benchmarks.



PIXIU: A Comprehensive Framework for Financial LLMs



PIXIU(貔貅)

A Large Language Model, Instruction Data and Benchmark for Finance

FinMA

FIT

FLARE

It is a comprehensive framework including the first financial LLM based on **fine-tuning LLaMA** with instruction data, the first instruction data with 136K data samples to support the finetuning, and an evaluation benchmark with 5 tasks and 9 datasets.

FinGPT: A Cost-Effective Financial LLM



AI4Finance

FinGPT: Open-Source Financial Large Language Models

downloads 4k downloads/week 94 python 3.6 pypi v0.0.1 license MIT Issues 67 Closed Issues 36 Open PRs 5
Closed PRs 44



FINGPT

Let us not expect Wall Street to open-source LLMs or open APIs, due to FinTech institutes' internal regulations and policies.

- Finance is highly dynamic. It is costly to retrain an LLM model like BloombergGPT every month (a cost of around **\$3M**).
- The cost falls significantly with FinGPT, less than **\$300** per fine-tuning.
- BloombergGPT has privileged data access and APIs, while FinGPT presents a more **accessible** alternative.
- FinGPT leverages the best available **open-source** LLMs.

FinGPT-Forecaster Demo

FinGPT-Forecaster

FinGPT-Forecaster takes random market news and optional basic financials related to the specified company from the past few weeks as input and responds with the company's **positive developments** and **potential concerns**. Then it gives out a **prediction** of stock price movement for the coming week and its **analysis** summary.

This model is finetuned on Llama2-7b-chat-hf with LoRA on the past year's DOW30 market data. Inference in this demo uses fp16 and **welcomes any ticker symbol**. Company profile & Market news & Basic financials & Stock prices are retrieved using **yfinance** & **finnhub**. For more detailed and customized implementation, refer to our FinGPT project: <https://github.com/AI4Finance-Foundation/FinGPT>

⚠ Warning: This is just a demo showing what this model is capable of. During each individual inference, company news is **randomly sampled** from all the news from designated weeks, which might result in **different predictions for the same time period**. We suggest users deploy the [original model](#) or clone this space and inference with more carefully selected news in their own favorable ways. Setting do_sample=False or modifying the temperature during the generation process also helps stabilize the prediction result.

Disclaimer: Nothing herein is financial advice, and NOT a recommendation to trade real money. Please use common sense and always first consult a professional before trading or investing.

Ticker
Companys from Dow-30 are recommended

Date
Date from which the prediction is made, use format yyyy-mm-dd

n_weeks
Information of the past n weeks will be utilized, choose between 1 and 4

If checked, the latest quarterly reported basic financials of the company is taken into account.

 Use Latest Basic Financials

Information

Response

<https://huggingface.co/spaces/FinGPT/FinGPT-Forecaster>

Opportunities in Financial LLMs

- **Rapid Development of LLMs:**

The development of large language models (LLMs) is progressing quickly. Many domain-specific LLMs are being created to address specialized needs across various industries.

- **Innovation in Products and Services:**

Generative AI and LLMs are crucial in creating new products and services, driving innovation, and enhancing customers' value propositions.

- **Adoption of Open-Source LLMs:**

Numerous open-source LLM projects are available for businesses to adopt. Leveraging these resources can accelerate development and implementation, offering cost-effective and customizable solutions.

Challenges and Risks of Financial LLMs

- Data Privacy Concerns
- Model Accuracy and Bias
- Cost of Development and Maintenance
- Ethical Concerns

THANK YOU