Asset Management in the Age of ChatGPT: How AI is Reshaping the Industry

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ChatGPT has launched a new era in artificial intelligence (AI).

ChatGPT, built by OpenAI and powered by the GPT (Generative Pretrained Transformer) model families of large language models (LLMs), responds to natural language prompts much like a very well-informed human assistant, and has continuously evolved with the introduction of GPT-4, ChatGPT APIs and Plugins.

What makes ChatGPT so amazing?

AI, or machine learning, has already been revolutionizing asset management businesses, through time-series analysis, portfolio optimization, and analyzing vast amounts of alternative data. However, with the emergence of LLMs, represented by ChatGPT, there is potential for a different level of evolution beyond the trajectories of traditional machine learning techniques. Here are three key features of LLMs that separate them apart from traditional machine learning techniques.

- **Scaling Laws**

Scaling laws refer to GPT models' features that their performance improves as model size, training dataset size, and the computing power used for training increase in tandem. This means that as the amount of data fed to ChatGPT increases, its performance in generating human-like responses to queries also improves.

- **Emergent abilities**

By scaling laws, one can forecast the performance of larger models by extrapolating performance of smaller models. However, there are many reported abilities that are not present in smaller models but "emerge" in larger models. Examples of such emergent abilities include solving arithmetic problems, answering questions, logical reasoning and multilingual capabilities.

- **In-context Learning** (zero/few-shot learning)

In-context learning refers to the ability of LLMs to change behavior in response to a small number of examples or prompts. This feature, called zero-shot or few-shot learning, shows that LLMs can quickly adapt to new contexts, even if it has never been explicitly trained on them. This is particularly important because LLMs can solve tasks without task-specific fine-tuning with datasets of thousands or tens of thousands of examples.

These features of GPT models represent a paradigm shift in AI development away from traditional machine learning models that are built and trained for each specific task. GPT models do not require large local computational resources or

additional training data, without the need for model fine-tuning or retraining.

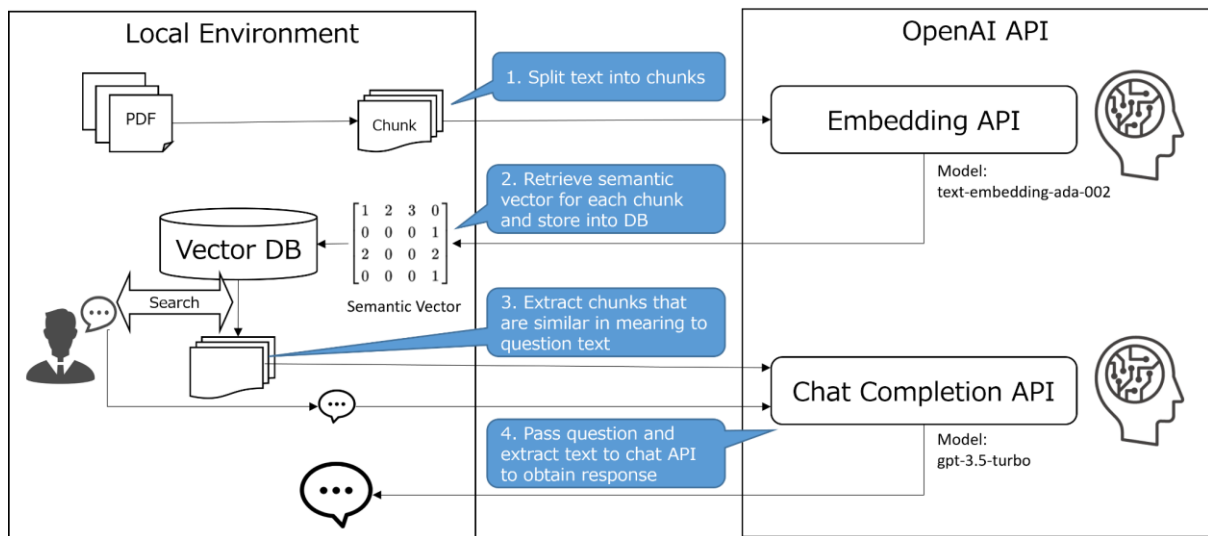**ChatGPT's limitations, and how to overcome them**

The performance of ChatGPT is remarkable, but its limitations have also been pointed out. The most notable example of ChatGPT's limitations is hallucination.

Hallucination is a phenomenon where an AI system generates false or misleading information that appears to be true. There is no easy way to avoid hallucination as it is in some way inherent to any machine learning models. Some studies report that the risk of hallucination decreases as model size increases, but it is important to verify the information provided by ChatGPT with other sources.

Another limitation of ChatGPT is that it is trained with text data up until a certain period of time (up to September 2021 for the current GPT-3 model). Thus, it is not able to generate summaries of the latest market environments, for example. However, by using Web Browsing Plugin or Bing AI chat functionality, users can supplement ChatGPT's data with the latest information available on the web.

GPT model is trained with an enormous amount of publicly available text, which means that off-the-shelf ChatGPT cannot create answers based on nonpublic documents such as internal memo or investment commentaries. However, as shown in the figure below, it is possible to develop a system that generates answers based on proprietary data by using API provided by LLM vendors.

Sample Architecture of "chat with your own data" system

Source: Nissay Asset Management

Under this architecture, input data and queries are stored exclusively in the local environment, minimizing the risk of information leakage. Such systems can even be developed in a no-code manner such as the "Add your data" feature of Azure OpenAI Studio.

Can ChatGPT generate alpha? - Potential Use Cases

Marveling at the capabilities of ChatGPT and LLMs, one of the questions that people in the asset management industry may have is whether ChatGPT can be used for making investment decisions. Will fund managers be replaced by these powerful AIs?

On one hand, ChatGPT can greatly streamline the investment decision-making process. With its natural language processing capabilities, it can be used for various use cases by analysts/portfolio managers, efficiently enabling fund managers to make informed investment decisions efficiently.

Moreover, ChatGPT can be directly used for some natural language processing (NLP) tasks, such as extracting sentiment from texts (news articles, analyst reports, company filings or central bank announcements). This means that instead of training machine learning models like BERT, LLM can perform such tasks with zero- or few-shot learning techniques. Outputs can be used to inform portfolio managers/analysts, or even used as a signal of a systematic model-based investment.

ChatGPT as an AI language model does not steal human jobs in the traditional sense. It is a tool designed to assist humans in tasks that involve language processing, such as generating text and answering questions. While ChatGPT can automate certain functions and reduce the need for human involvement in them, it can also create new jobs that require AI, data analysis, and programming skills.

Although machines can assist with decision making and persuasion, humans may be better equipped to conduct groundbreaking discoveries and exercise responsibility for their actions. In investments, ChatGPT may provide assistance rather than full automation.

Potential ChatGPT Use Cases for Investment Management

Investment Research	Conduct initial corporate research Prepare company meeting agenda Summarize transcripts from company meeting recordings Draft engagement letters to corporate management
Portfolio Management	Summarize market news, extract market sentiment from text Draft market overview commentary Assist computer programming to automate data handling

Marketing and Client Support	Draft press releases, marketing materials and websites Draft response to client queries Summarize transcripts from webinar recordings/interviews Create response to RFPs
Client Reporting / Portfolio Advisers	Draft investment content for clients Generate personalized investment advice for clients
Legal and Compliance	Draft contracts Review marketing documents against compliance guidelines

Source: Nissay Asset Management

Building secure ChatGPT environment

The easiest way to use ChatGPT is to use the web interface provided by OpenAI. However, by default, there is a possibility that the data entered "may be used to improve model performance" by OpenAI, i.e., used to train the model. Therefore, entering confidential or personal information poses a legal risk unless the firm can force all users to opt out of this feature.

Therefore, building proper and secure infrastructure is a key to enterprise-wide adoption of ChatGPT. At the time of this writing, building infrastructure with Microsoft's Azure OpenAI Service is considered the most prudent approach (see table below). However, technology in this field is evolving rapidly, and new managed services are expected to be offered one after another. It is important to always stay up-to-date and build the optimal infrastructure with the right partner.

Key features of GPT terms of service

Provider	OpenAI	OpenAI	Microsoft
Service	ChatGPT Web	ChatGPT API	Azure OpenAI Service
Input data is used for training	Yes (can opt-out)	No	No
Input data is stored	Yes, for 30 days	Yes, for 30 days	Yes, for 30 days (can opt-out)
Service Level Agreement	None	None	99.9% guaranteed

Source: Each service's website as of 2023/06/28
Note: Terms of services are updated frequently and therefore it is advised to check the latest ones.

Conclusion: Copilot, not full autonomous driving

The dawn of the generative AI era marks the beginning of a transformation in how asset managers and other white-collar professionals do their jobs. Those who leverage AI as their copilot will boost their productivity, while those who fail to embrace this revolution risk losing their competitive edge. As various fields integrate AI, the technology will redefine the workplace and lead to new standards of efficiency and effectiveness.

(References)

Kanokogi and Satoh, "ChatGPT and Generative AI: What They Mean for Investment Professionals", CFA Institute Enterprising Investor Blog (09 May 2023)

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