The Impact of Large Language Models like ChatGPT on Forecasting

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A glimpse into the future's sight,
Forecasting brings new hope and light,
With models and data as our guide,
We venture forth on what lies outside.
A challenging task, yet we still try.

A poem by ChatGPT

ChatGPT, a state-of-the-art language model developed by OpenAI, has revolutionized the AI field. By exhibiting humanlike skills in a range of tasks such as understanding and answering questions, translating languages, writing code, passing exams, and even composing poetry, ChatGPT has quickly gained popularity. In recording 100 million monthly active users within just two months of its release, ChatGPT has established itself as the fastest-growing consumer application in history. So what is the future of ChatGPT and similar large language models, and what will be their impact on the field of forecasting?

The Future of ChatGPT and Other Large Language Models (LLMs)

The field of language models can be traced back to the mid-1960s with ELIZA, a simple program developed by Joseph Weizenbaum at MIT that used a naïve set of rules to mimic human conversation, allowing it to respond to user input in a way that seemed natural and conversational. It was not until the 1990s, however, that more advanced language models were developed using deep learning, and then not until June 2020 that they became popular with the introduction of GPT-3. GPT-3, incorporating 175 billion parameters, allows the generation of coherent, humanlike text that makes possible a wide range of natural language processing tasks with impressive accuracy. GPT-4, expected to release around the time of this publication, will utilize trillions of parameters and offer significant improvement over ChatGPT.

Given the phenomenal success of ChatGPT, it is inevitable that competition among tech giants will intensify while new startups will be entering the race to profit from the perceived commercial potential of LLMs. Already Microsoft has committed a $10 billion investment to OpenAI and announced the incorporation of ChatGPT into its Bing search engine. Google invested $400 million in startup Anthropic, and is entering the race with Bard, its own version of LLM.

Startups and Chinese players will enter this promising market, intensifying competition and enhancing the existing LLM technology. Improvements will include a deeper understanding of content and knowledge as well as comprehending and responding to emotions and other aspects of human language communications. Specialized LLMs are being developed in areas like biology, health care, life science, weather, and climate science, while GPT technology in the near future will be integrated with search engines to expand and continuously update their knowledge base while allowing searches using natural languages. Furthermore, GPTs can be used as an Application Programming Interface (API) portal to utilize their natural languages ability and provide answers to queries.

The Impact of LLMs like ChatGPT on the Forecasting Field

Artificial intelligence is capable of replacing human workers in white-collar jobs by automating tasks requiring higher-level skills. This includes forecasting, where predicting the continuation of established patterns/relationships is already done more accurately by ML models than human forecasters (as the M5 competition has shown). ChatGPT can improve forecasting practice in at least three ways:

1. Providing relevant information about any forecasting topic

The question "Please describe for me the major findings of the M Competitions" was posed to ChatGPT. Below is its (shortened) response:

> *The M Competitions, also known as the Makridakis Competitions, were a series of forecasting accuracy competitions organized by the International Journal of Forecasting. The competitions aimed to evaluate the performance of different time series forecasting methods and to provide insights into the strengths and weaknesses of these methods.*
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> *The major findings of the M Competitions include:*
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> 1. *Simple methods perform well […]*
> 2. *No single method is always the best […]*
> 3. *The importance of domain knowledge […]*
> 4. *Combination methods can improve accuracy […]*
> 5. *The performance of methods depends on the data […]*
>
> *These findings have important implications for practitioners and researchers in the field of forecasting, as they highlight the importance of considering the characteristics of the data when selecting a forecasting method, as well as the potential benefits of combining multiple methods and using domain knowledge.*

Having instant information about any forecasting topic will eliminate the need for time-consuming searches and affect forecasting education (including the need for books and research papers). Forecasters will have more time to concentrate on improving the forecasting process.

2. Making judgmental adjustments to the Stat/ML forecasts

Although there has been a substantial amount of research on how to judgmentally adjust quantitative forecasts while minimizing human biases, there has been limited success in improving the overall accuracy. ChatGPT can systematize the way adjustment decisions are made by providing objective information about the accuracy of past adjustments. For many companies, the forecasting process includes meetings of marketing, sales, production, and financial managers. Such meetings can be recorded and summarized by ChatGPT. Reasons for judgmental adjustments can be documented, along with evaluation of past forecast adjustments to guide future adjustments. Such information could identify recurring mistakes, underperforming individuals, and consistent biases that can be avoided.

3. Preparing to face future uncertainty

Forecasting models, whether statistical or ML methods, predict the most likely future. Many models denote uncertainty by providing a lower and upper interval that future actual values will fall into with a certain probability. Such uncertainty is rarely used effectively in practice, as users are not comfortable with considering and preparing for the risks involved. ChatGPT could change that, however, by – in ChatGPT's own words – "taking steps such as developing contingency plans, staying informed, building resilience, fostering a culture of adaptability, and continuously improving processes and systems. These actions can help increase the ability to deal with uncertainty and make more informed decisions."

Conclusions

ChatGPT is an AI breakthrough with profound implications to our lives and work, one capable of replacing a good number of jobs and increasing wealth inequality. Along with similar LLMs, ChatGPT will continue to improve, perfecting the ability to perform tasks done by humans. They will eventually become self-learning and self-improving (instead of being trained by huge amounts of data), achieving some form of Artificial General Intelligence (AGI) sometime in the future.

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