



Artificial Intelligence: The Return of The Centaurs

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Back in 2016, [we wrote a blog](#) exploring the series of milestones leading to the development of artificial intelligence (AI)—and the “human vs. machine” discourse. It started with Garry Kasparov losing to Big Blue in 1997 to eventually winning Freestyle Chess matches against such computers as a “centaur,” harnessing the combined power of computational speed with human ingenuity. Since then, advancement in machine learning (ML) capabilities has continued to accelerate—fuelled by falling costs in computing power and increasing sophistication of ML algorithms.

Fast forward to November 2022: OpenAI releases ChatGPT, an AI chatbot with astonishing capabilities for producing detailed replies to queries covering a broad set of knowledge domains. Since ChatGPT’s emergence, the question of AI’s promise is centre stage once again—and the race to capitalize on its functionality and potential have been swift. In January 2023, Microsoft made a \$10 billion multi-year investment in OpenAI, its third and largest investment in the company after previous investments in 2019 and 2021, and integrated the query feature of ChatGPT into their Bing search tool—their latest challenge to Google’s hegemony in search. Google responded with the release of their own language model, Bard. Others, too, are entering the fray—the world is hyped up and forecasters are pointing to a wide array of different scenarios from, “nothing to see here” to “we are days away from the singularity.”

As fundamental investors who embrace the “centaur” approach of human + machine, the falling cost in computing power is a theme worth returning to. In our view, it’s the most important long-term driver of ML’s widening application scope in the real world, which is already more pervasive than one might think. ChatGPT’s emergence is closely tied to this trend and illustrates how supplementing ML models with human training can produce something more potent than “pure machine-learning” models. In other words, the power of the centaur persists, and in our experience, offers exciting practical applications for “boring” investment processes.

First, Some Definitions: What is AI? What is ChatGPT?

Artificial intelligence is a loaded suitcase¹ term referring to a wide range of phenomena involving automated decision making by software. A more concise term usually drawn from the AI suitcase is machine learning or “ML”—a field with origins in the 1950s. Historically stymied by hardware limits, ML today is a flourishing field – thanks to Moore’s Law driving down the cost per unit of computation dramatically. ML works by “training” a model inductively, i.e., ignoring the causal relationship between input and output. Instead, the trained model predicts future output based on the output historically associated with a given set of inputs. An example of such a model is the movies that Netflix recommends to a user. The recommendation is driven by a variety of inputs such as the movie-watching history of the user (input) fed into a ML trained model to predict what movie the user might be interested in (output). That model may have been trained on many inputs such as the probability that movie X is of interest to someone who has watched movies Y and Z.

These ML models are more common than you might think in everyday life. Amazon uses it to recommend items to add to your basket based on what is currently in your basket and purchase history. Banks use them to detect fraudulent transactions and to improve underwriting. Doctors use them to diagnose x-rays. Virtual assistant software (e.g., Siri, Alexa, and Google) use them to predict the intent behind voice commands. Spam filters use them to filter out junk mail. Autocomplete uses them help you compose emails. Chatbots,

¹ In *The Emotional Machine*, the late Marvin Minsky coined the term “suitcase word” to describe words into which people attribute—or pack—multiple meanings. We ‘unpacked’ the concept more as it relates to investing [in this blog](#).

traffic prediction, credit scores, social media feeds, and security threat detection systems are all applications of ML in everyday life.

ChatGPT is another instance of this growing ML heritage. A large-scale ML-trained language model trained on a massive corpus of text data, its two main achievements relative to historical language models (such as Siri) include 1) a much larger training set: 45 terabytes of text data from the internet including books, articles, and webpages; and 2) an unprecedented (for a language model) level of human intervention to aid the model's training. This training included large-scale human scrubbing/cleaning/focusing of the data and, most importantly, the use of human evaluators to review the potential responses of ChatGPT to a query. That additional human evaluation produced a leap in the model's query-response quality, which largely has fuelled a surge of interest in AI, and a record-setting uptake of the software itself, reaching over 100 million active users by the second month of launch.

AI and The Investment Industry

In investing, "quant" funds commonly use ML to create models that predict future prices in reaction to new inputs. In our view, the complex drivers of the stock market make such models extremely sensitive to overfitting, which occurs when the model picks up historical patterns that do not have predictive power looking forward. However, there are certainly niches where machine-learning models can help fundamental managers such as detecting sentiment shifts, predicting the cost of capital, or order execution. In short, machine-learning models are used widely in the investment industry with a wide range of efficacy.

We also see a number of potential applications of ML models in the investment industry, such as generating better context/base-rates around potential investments (e.g., the cost of capital as highlighted in the next section), automating data collection (freeing analysts to spend more time on the analysis of the data rather than collecting/scrubbing it), and monitoring events such as earnings releases, news articles, industry research publications, and social media.

With such opportunities also come risks around the model complexity and quality of the output generated. Additionally, data integrity, cybersecurity, and compliance risks are potential challenges to consider. In our opinion, winning teams will look at leveraging big-data as an opportunity rather than a threat—human enhanced by machine rather than human versus machine.

Human + Machine: AI at Mawer

The Research Lab ("The Lab")—a decentralized group founded by our Research team that draws skills from tech and data specialists across the firm—have been focused on experimenting and testing different ways of incorporating technology into our investment process since 2015.

An early example of a ML application developed by The Lab is the "Synthetic Credit Rating." It is a proprietary model that generates credit ratings for public companies that don't have a rating, which we built by training a model with data from public companies that have public ratings. When reviewing a company that does not have a public credit rating, we can leverage the model to generate an estimate of what the company's public credit rating would be if it was covered by a ratings agency. That credit rating output is then used to fuel a cost of capital estimate in a discounted cashflow model. Rather than removing judgement, it enhances the rigour of cost of capital estimates conducted by our analysts.

A more recent ML application from The Lab is the conversion of ad-hoc classifications of regions to predict systematic classifications. For instance, if a company generates 80% of its revenue from “North America” and 20% from “Rest of the World” the model would help us convert “Rest of the World” into a more useful breakdown based on other available company information (and the North America to a reasonable split between the U.S., Canada, and Mexico). This helps the Research team better understand underlying exposures in our portfolios.

Conclusion

Recent AI breakthroughs are underscoring the power of the centaur model—humans + machines—creating something more potent than either model operating independently. We think the key to leveraging the latest advances in “AI” is more cultural than technical. Firms that experiment with it, with a curious mindset, should find new applications in scope to improve their business.

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