AI TEETHING IN A FAMILY OFFICE

Artificial intelligence (AI) is a process that applies statistical formula in a computing environment to huge amounts of data, that humans could not possibly process either individually or as a group.

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Alan Turing originated artificial intelligence in successfully breaking the Nazi's Enigma machine coding, to assist the Allies during WWII. In 2012 CERN announced they discovered the Higgs-Boson, one of the smallest subatomic particles known to man, which until then had only been theorised. They achieved it by using machine learning (a form of AI) to analyse the huge amount of data generated from its Hadron Collider. These are two of its most renown usages, but what if AI could be used to find the theorised (or discredited) alpha in investment theory?

Today artificial intelligence is used in: facial recognition, translation, diagnosing medical conditions, display of personalised news and advertising feeds in social network media, being the best "go" (an oriental game) player, providing customer chat assistance, on-boarding and managing retail wealth management client portfolios, predicting peek electricity generation requirements etc.

Python is the most popular computer language for use in AI and most of the basic software is available open source from the internet, as are the platforms. Excess computing power is also available from the cloud (if you trust the security) for a fee. The two main strands of AI are machine learning that processes all the data at once, and deep learning that breaks down the data into small portions and then like humans learns and forgets from the experience of each small portion.

Machine learning mainly relies on your CPU i.e. the little Intel or AMD sticker on your laptop and, deep learning mainly uses the GPU i.e. the Nvidia units that power the best gaming computers.

The biggest danger of using the huge processing power of AI is the tendency to data-mine, this leads to a perfect (or optimal) correlation to the previous data without any relevance to the understanding of the relationships of the inputs to the outputs. Data-mining is not such an issue for pure science such as physics or chemistry as the law is the law, but for behavioural or social and art and creativity it is usually a big fail. An attempt to avoid these data-mining issues is cloning or twining (as they say in Northern California) the characteristics of an individual into the machine so as to replicate humans methods.

Having only taught myself python after attending a presentation from a former CERN employee in 2016, I aimed to position my firm at the cutting edge of implementing AI, although the Medallion Fund of Renaissance Technologies have been providing spectacular results for over 30 years. Being a top stock picker for a big four UK bank and then a successful individual investor during the 2008/9 Great Recession, I set out to twin myself. With my core i5 CPU laptop I initiated a machine learning forecast of the S&P 500, improving our excel spreadsheet that had already provided excellent results for the previous three years. The inputs being market and macro economic data for over 100 years, although the range of inputs was limited by the laptop RAM which froze if the number of inputs were too large. I also improved on our excel sheet US 10 year Treasury yield valuation. Stock picking AI was also initiated using mainly technical data, after a traditional screening of the universe; which together with the AI S&P 500 forecast provided spectacular results in 2017.

In 2018 the S&P 500 forecasts of both the AI and excel spreadsheet provided a good indication of the direction of the market. However even though I had additionally developed natural language processing and sentiment analysis of company news, the stock picking failed. The solution was to implement the fundamental, quantitative, qualitative, technical, and traditional methods of the best investors, that I had previously used in my previous banking career. However this required a massive improvement in hardware to manage the inputs and so I purchased a top of the range gaming Alienware laptop with Intel core i9 CPU and Nvidia GeForce GTX 1080 GPU.

The tweaks worked and 2019 provided spectacular stock-picking results, in a very difficult market as factor investment favouritism violently reversed in the second half of the year. But the overall market indicators failed miserably in the best year for the S&P 500 since 2013. Disappointingly, after the event, I identified I had been incorrectly monitoring the AI that may have correctly forecast the market. But my main ambition for the year was to develop our first deep learning capabilities to leverage the hardware purchase of the previous year, and in the last week of December it was achieved. This gave us a springboard to choose a far wider range of inputs and their interactions for both stock-picking and asset allocation; and provide the minimum level of diversity for a consensus view of the market.

In the fourth year of using AI our firm has now advanced to both monitor and manage, all aspects of using and developing AI in our family office environment. We have a pipeline of cutting edge technologies to implement, together with the confidence to manage our existing processes. There is also the opportunity to apply applications to our expanding investment universe e.g. most recently our first direct venture investment. The application of AI on the full range of family office services, and the original operating business that spawned them, just requires a sufficient amount of in-house or external data to give credibility to the process.

For family offices that do not yet have in-house capabilities but wish to implement AI, a solution is to hire a data scientist but, careful consideration needs to be made in the development of proprietary techniques and to ensure that data-mining is kept to a minimum. There are also a number of off-the-shelf solutions and consultancies that can assist. It could be a painful experience for any organisation that seeks to implement AI, especially for those with a disciplined budget constraint preventing multi-year/generation testing before implementation. However if the AI is designed to relate to the conceptual framework of the humans it aims to twin the productivity gains are immense.

Steven J Cohen CFA is the principal and CIO of a Zurich based multi-family office. He gained his BSc Econ from UCL, spent several years in Chartered Accountancy and, was the entrepreneur of a retail clothing business in central London. Later he became in-house counsel to the UK's wealthiest family, and following managed a multi billion dollar equity portfolio for a big 4 UK bank. After very successful investing returns in 2007 & 2008 he established his family office, and today develops artificial intelligence generated investment strategies for a global client base.