Artificial intelligence (AI) is an increasingly popular topic for the finance industry. Despite recent advances, many applications of this extraordinarily expansive area of computer science are still in their infancy. This is particularly the case with regard to AI and Asset Management. It is our belief that the real source of help to the industry is Intelligence Augmentation (IA), which uses AI to help humans make decisions, rather than making the decisions for them. Here, we explore the ways in which human led data science can be used in a sustainable and repeatable way to improve outcomes for investors.

Marketing material for professional investors and advisers only

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Artificial intelligence (AI) is a popular topic. Coverage of driverless cars, for example, has fostered excitement and sparked the imagination of what may be to come. From a consumer perspective, these and other AI advancements are an advert for how technology might shape the future. Within the investment industry, such innovations have created intrigue as to whether machines will replace human portfolio managers. ‘Robo-advisers’ already exist, providing basic financial advice using algorithms calculated from questions being asked. Computing power continues to grow and a vast library of historical market information is now at our disposal from which we can attempt to predict future outcomes with greater accuracy. So is AI-driven asset management that far off?

Despite the advances in this area, we believe that some reservation is warranted before we give our fiduciary responsibilities (and our capital) over to machines. One type of AI that has potential for the investment industry is Machine Learning: the use of statistical algorithms and techniques to learn, and systematically improve, outcomes for a given task without any explicit programming. One of the most common commercial applications of machine learning is predictive analytics, i.e. using existing data to help forecast what future results might be. AI is a heterogeneous computer science and there are a number of different types of predictive analytics systems within it. It is worth comparing how the use of IA and AI could be applied to investing.

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Conceptually, driving a car and investing have some similarities – both involve getting from A to B as quickly and easily as possible without taking too many risks. In the case of investing, ‘B’ (the destination) can be capital preservation or retirement planning.

In the field of autonomous driving, the type of AI used is called an Autonomous Driving Platform (ADP). While the ADP – the AI component – is technically what simulates the human, that is “drives” the driverless car, it is in fact the various external factors (Component 01 in Figure 1 on the next page) being instantaneously and continuously collected which deliver the critical component in the driving system. These external inputs are fed into the ADP (Component 02) which, along with a pre-loaded guidance database, produce a synthetic driving behaviour similar to that of a human driver, such as adherence to traffic signals, acceleration or deceleration, and responding to obstacles in or near the path of the car.

This is referred to as a Perception-Action Cycle. What makes the ADP unique is that all of the information is stored and constantly re-evaluated in order to refine the external output. That is, the system “learns” how to be a better driver with each mile driven.

What determines the quality of learning is the quality of the input. When it comes to obtaining optimal AI outputs, there are five key computation parameters:

1. A constant environment where the rules are fixed and don’t change
2. The data is digital and quantifiable
3. Data is abundant (this could vary by industry)
4. There is low uncertainty
5. Objectives are clear

In our view, these elements are necessary for AI to succeed.
What’s in an acronym: How AI and IA work together

For investors, IA is a much more relevant area of science than AI. It enables us to extract insights few others can discern – even with the data being in plain sight. This has tremendous advantages when it comes to fundamental investing. Note that in many of the driving examples above the driver is made aware of things that are otherwise hidden or hard to perceive – (a car in a blind spot, traffic on the route of a journey). You can drive your car without this information but you will drive it to your destination more quickly and safely if you have this additional information.

Any fund manager in considering an investment has access to many useful pieces of information about a company – its financial state, its revenues, the stated plans of its management. But there are other important things that investors do not currently have access to through traditional channels. For example:

- What do consumers really think about a particular brand?
- How are consumers’ opinions being influenced by a company’s strategic initiatives or a scandal that might have occurred?
- What demographic group does it currently most appeal to, and is its growth going to be achieved by focusing on them or expanding to other groups?
- Are its retail outlets located in the areas within driving distance of its target consumers?

The companies themselves will be able to answer those questions, as it is central to how they plan their corporate strategic goals. Whole departments are dedicated to mapping and analysing data on local populations, running surveys and examining loyalty card data to inform their strategic plans. However, most investors only get to see fragments of this information in company reports and earnings guidance, rather than a complete picture of that company and their sector.

However, if the datasets that can fill these blind spots are publically available (as they are sold by research agencies, published by governments and circulated by industry bodies) very little remains proprietary to an individual investor.
How then does any one investor gain an advantage? The main issue is that these datasets are far too big and too unstructured for an investment professional to utilise. Turning the data into insight, to fill a blind spot, requires deep expertise in statistical methods, data engineering and mathematical modelling. Imagine seeing the GPS traces of millions of phones when really you want to know is if the roads have a traffic jam. In order to condense data into something that can augment intelligence and help a human to make a better decision, an IA interface is required.

Returning to the five conditions required for AI tools to succeed, we believe that long-term investing will remain a human task because the following conditions for AI to be effective are often lacking:

1. **Constant environment**: This isn't the case for investing. Markets are always changing, with continuous innovations in structure, regulations and the behaviour of market participants.

2. **Abundant data**: This can be the case for short-term trading but it would be difficult to apply this to fundamental investing as good quality company data only goes back a few decades. This is not nearly enough for any algorithm to tease out any complex relationships. The global financial crisis of 2007-08 played out more like the 1930s depression than more recent recessions but there are few data sets that go as far back as that. Even if such data sets were available, there is doubt as to how they would provide any discernible insights given how many other things now are completely different following 80 years of social, financial and technological developments.

3. **Low uncertainty**: This is not applicable for investing. Financial markets are volatile and unpredictable with prices driven by investors operating on multiple different time horizons and thrown by market impacts and irrational biases. Complex networks of algorithms can trigger flash crashes, adding to market volatility.

4. **A clear objective**: For investing as a general concept this is clear, but for individual funds with different objectives, there is no single moment in time when any given investment has succeeded or not. Due to fluctuating prices, it is difficult to evaluate whether a security may or may not eventually yield a profit. Investment objectives are dependent on the audience: for example a closed defined benefit pension fund is unlikely to want the volatility of a Small Cap Equities fund, while the same fund may be very appealing to those with a larger risk appetite.

5. **Digital information**: Good investors synthesize all the relevant information available to them (including, but not limited to: research reports, their understanding of market forces, the effects of company management, regulators and politicians, the mood of the market). However the nuances of that information and particularly the more qualitative aspects are difficult to digitise.

**Conclusion**

We believe the biggest opportunity to achieve better investment outcomes for asset owners, using artificial intelligence and machine learning, is for data scientists to augment the intelligence of fund managers, closing their blind spots and allowing them to see further, more clearly and more reliably. The information edge is particularly significant when many market participants lack the ability to close these blind spots, whether through lack of technology, initiative, scale or structure. And there are ample opportunities to use 'AI' techniques such as Machine Learning to refine and sustain this information edge.

It is still up to the individual fund manager whether to buy or sell a security. But think how good it feels to exit the motorway a mile before congestion and take a traffic-free detour while everyone else sits in their cars because they didn’t know the jam was there. Conversely, an even more well-informed driver, with specific familiarity of a newly opened route or upcoming incident, might elect not to blindly follow the guidance that his or her GPS system instructs them to take – in some instances a rather dubious detour based solely on an unattended algorithm. This, in our view, is where AI and IA find their optimal balance.

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