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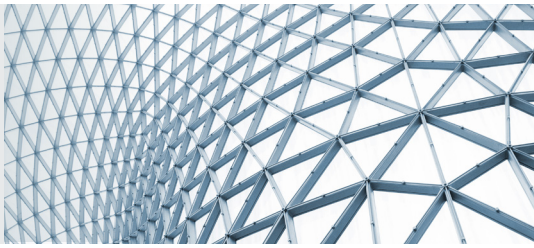

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AI and ESG: a new frontier for financial innovation?

Can you combine Artificial Intelligence (AI) and environmental, social and governance (ESG) investing? This question was at the core of a fascinating debate between two AI experts: **Dr Luc Julia and Dr Carmine de Franco**

Based in France, Ossiam is an affiliate of Natixis Investment Managers that has been speciali-sing in quantitative and systematic asset management since 2009.The premise for the event was that AI is poorly understood and creates as many myths and fears as it does hopes and aspirations. Bruno Poulin, CEO of Ossiam, kicked off proceedings by noting that research and innovation were at the heart of Ossiam's product development process. The two AI experts then sifted through the facts in order to prise the truth from the fiction.

What is AI?

LJ : We cannot compare AI to what we see in films like Terminator or Her. Machines are never going to take over and will never rule the world, whatever Hollywood might have us believe. This is pure science fiction. All this stuff stems from a massive misunderstanding. At the 1956 Dartmouth conference, John McCarthy persuaded his colleagues to start using the term 'artifi-cial intelligence' to describe a discipline which actually had nothing whatsoever to do with in-telligence. All the myths and misconceptions that infest any discussion of AI today derive from this unfortunate misnomer. That is why I prefer to talk about intelligence as 'augmented' or 'advanced' rather than 'artificial'.

In truth, AI is just maths, logic and statistics. It allows us to build high-performance tools that will help people achieve great things: making daily life easier for everyone, improving their pro-ductive capacity. This intelligence is systematically controlled by people and can be used in any field. And this has been happening since the dawn of time.

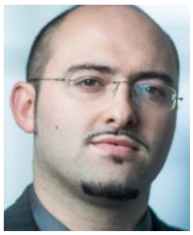
Machine learning is one class of predictive models within the AI family. It concerns algorithms that, fed with a series of similar cases (in the form of datasets), can then extrapolate on their own a number of predictions by first identifying the structures and relationships embedded wi-thin their learning data.

The key to these systems is recognition of knowledge. To work efficiently, machine learning needs a lot of data, which also has to be high-quality so as not to bias future results. AI has come a long way in visual and voice recognition but still has its limits. This is where it differs from human intelligence. AI is discrete and specific. It invents nothing and can only do a defined task. Human intelligence is superior - diverse, complex and flexible.

Whatever area they look at, a human being will form an opinion, some sort of response - even if it's wrong. In other words, AI is just another tool available to us, which we can use for better or worse, and which has many applications. There is not just one but many AIs. An AI that plays chess, an AI that can drive, etc.

Dr Luc Julia

Senior Vice-President of Innovation, at Samsung, and co-founder of voice-controlled digital as-sistant, Siri, has worked at MIT, the CNRS and for Apple and **Samsung**.



Dr Carmine de Franco

Franco is a scientist by education and heads fundamental and ESG research at **Ossiam**.

> *"ESG data is hard to exploit. Analysts outperform AI if they are only looking at a few dozen firms. But the algorithm does better once we start talking about thousands of firms."*

Take Siri, for instance. It was launched in 1997 and had quite a tough start – it was only able to handle about 80% of requests. To fix this, we made the algorithm more human, giving it the feel of talking to a real person. If you like, we added a bit of artificial stupidity. So, when Siri didn't understand, it responded with a joke.

How far can AI take us as human beings?

LJ : If we use the example of autonomous vehicles, the cars we have now, like Tesla's vehicles, these are level 3. Level 4 autonomous vehicles should be out soon. Level 5 autonomous vehicles will never happen[1]. An autonomous vehicle that follows the highway code would never ma-nage to cross the Arc de Triomphe roundabout in rush hour. People adapt. Machines cannot. Machines find it easier to beat us at go or chess than to drive. Human beings can cheat and bend rules. Machines do not understand bent rules.

What is the environmental impact of AI?

LJ : AI uses a lot of energy.. AlphaGo [Google's AI system which beat the world Go champion in May 2017] consumed 440 kWh[2]. By contrast, human brains burn about 20 watts an hour. We are going to hit the wall unless we can get AI's energy consumption right. What we need is education and regulation to solve this issue.

What can AI do for finance?

CdF : Portfolio management at Ossiam is systematic. By this I mean that it is given an investment rule, often expressed quantitatively, and it applies it systematically. This has the advantage of limiting the human biases, whether conscious or unconscious, that skew our judgement in doubtful situations.

AI, in contrast, means we do not have to define systematic 'rules', as it can pick out these rules, or patterns, autonomously based on its learning. Given the size of the databases now available, AI means we will be able, by cross-referencing data, to identify links that would be hard for a human to spot between various data sources and the behaviour of financial assets. Correlations can emerge. But algorithms also have their own biases, deriving from the choice of data they use to learn.

LJ : That's true. Microsoft's Tay chatbot, which was able to interact via Twitter, was taken offline less than 24 hours after launch, when it started tweeting sexist and racist comments. It turned out the algorithm had been primed with data from conversations happening in the southern states of the US during the 60s. It is hard to find high-quality annotated conversational data.

CdF : You educate an algorithm like a child. You have to feed it high-quality data so it can 'learn' on its own.

Why is AI better than a human when analysing ESG data?

CdF : Being able to use an algorithm stops you being swamped by the sheer mass of data. AI can take into account more subjects than an analyst who will only skim over them. This is why you need to delegate the task of selection to an algorithm.

ESG data is hard to exploit. Analysts outperform AI if they are only looking at a few dozen firms. But the algorithm does better once we start talking about thousands of firms. For ins-tance, an algorithm can identify that a certain ESG profile is often linked to a specific financial behaviour (eg performance) and can then segment stocks by profile type. Machine learning in-corporates this profile and others on different ESG issues to create something like a panel of virtual experts, able to determine whether an investment is a risk or an opportunity.

Machine learning applies ex ante rules and observes patterns. At Ossiam, we restrict the space that machine learning can explore. We build in filters via a systematic allocation that allows for the risk that the selection will ultimately happen. So the human being remains in control.

Do you look at the future with optimism or pessimism?

LJ : JI am an optimist. Technology is there to improve people's lives. Of course, we can make mis-takes – using too much energy, for instance – but I am sure we will get over these hurdles, no-tably through regulation.

People will not be replaced by a machine. Ever. We will always have experts. Some specific tasks will be replaced. And new jobs will be created around these new technologies, as has happened since the dawn of time.

Written on 20 November 2019

1 European and international norms define the degree of a vehicle's autonomy according to 6 levels. Level 0: Driver only. Level 1: Driver is assisted. Level 2: Partial automation, overseen by driver.

Level 3: Conditional automation. Level 4: No driver in specific circumstances. Level 5: No driver, fully autonomous vehicle For further details see https://en.wikipedia.org/wiki/Self-driving_car#Classification

2 kilowatt-hour (kW.h or kWh): The energy used by a 1,000 watt machine in one hour. For compa-rison, a continuously playing radio alarm clock uses 20kWh and a classic electric oven 165 kWh. Source: https://www.energiedouce.com/content/12-conseils-faq-consommation-electrique-des-appareils-electromenagers

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