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Humans vs. Robots: Man Fights Back

An Interview with Professor Alex Preda
By Mike O'Hara and Ricky Treadwell, 16th January 2013

The 'rise of the machine' is a phenomenon frequently hyped up in the financial media. It stirs up luddite-esque emotion from many investors and brings about a fear of the unknown. There is however hope for humans. **Professor Alex Preda** talks to HFT Review about the revival of Man in the battle against the bots.

This interview covers Alex's ground-breaking research into the modern day retail investor. It will necessarily evoke opinion, so please feel free to contribute yours to the discussion box at the foot of this page.

Alex Preda is a professor of finance at King's College London. He has recently conducted the project ***Technology, Action and Cognition in Online Anonymous Markets: A Sociological Study of Non-institutional Traders*** and is investigator on ***Evaluation Practices in Financial Markets***, a five-year project funded by the European Research Council. In addition he is author of the book ***Framing Finance*** and an expert on the man vs. machine debate.

HFT Review: *Alex, welcome to HFT Review. Can you start by providing some background to your research?*

Alex Preda: Certainly. Since 2005 I have been looking more and more at electronic finance and how traders cope with trading technologies, how their use of technology influences their decision making, their judgement and their behaviour. During the last phase of my research I have looked more specifically at how traders relate to market automation and to trading robots. To give you a more concrete image of what I've been doing, I've not only been talking to a number of traders - about 60 - but I've also sat next to them while they were trading using these technologies and observed what was going on.

HFTR: *From your observations, how do you think the behaviour of traders has changed as markets have become more automated?*

AP: There are several things to be mentioned here. First, the behavioural changes from retail investors means that, contrary to popular belief, their role in the market is not diminishing. This theory is being proved wrong by a new generation of computer-savvy young people who are educated, who know how to program and are not afraid of computers. They are used to spending hours in front of a screen and their attitude towards the valuation of the securities they're trading - and their time horizon - is radically different from that of the traditional investor who bought a few shares and then sat on them for years. During the research I have done I haven't seen one case of a young retail trader who trades long term. The time horizon has been shrinking and shrinking. The attitude that one buys securities and keeps them in a portfolio for a long time, is not there anymore.

"Contrary to popular belief, the role of retail traders is not diminishing"

HFTR: *So would you say that the retail trading mindset is now geared towards speculation rather than investment?*

AP: Yes, definitely so.

HFTR: *And what is this new class of trader actually doing when they trade?*

AP: In the retail field, it's become highly differentiated. For instance, 12 years ago during the Internet boom, there was this phenomenon of day traders. The general perception was that these day traders knew nothing, that they were "noise" traders, that they traded only on the impulse of the moment, getting in and out of trades without having an established pattern or any sort of strategy.

"The new technologies of computerised trading and electronic markets have created new opportunities for access"

Back then if you remember, there were articles in the media that this kind of retail trader was going to be wiped out of the market. But what we see nowadays is exactly the opposite. The new technologies of computerised trading and electronic markets have created new opportunities for access,

so the numbers of retail traders are actually increasing not decreasing. If you look for instance at the Forex market, the largest market worldwide at over $4.7 trillion per day, about five percent of that is made up of retail traders, a significant share taking into account the daily volume.

But the differentiation among these traders has happened in the sense that some of them are now computer savvy and highly educated, in the natural sciences, mathematics or engineering. And they produce, test and use their own models. One thing I have observed is that the use of algorithms or robots in trading is not the prerogative of professional traders anymore. Of course you can see here that resources, especially financial resources, are different across and among categories of traders. Also access to technology is different, although to a lesser extent maybe.

I have encountered very active retail traders who build and use their own robots for doing transactions across different asset classes, in futures or in indexes or in currencies, juggling different types of markets at the same time. Another thing that is very interesting here is that the notion of the individualised trader working alone and in isolation is not necessarily valid across these types anymore, because many of these traders work in groups.

***HFTR**: How does that actually work in practice?*

AP: What happens is that they make really intensive use of communication technologies and they build groups on a global scale. I've seen for instance London traders working and building models together with traders situated on the US East Coast or in the Mid West. They use social media intensively in order to combine and match their skills, to develop trading algorithms. This kind of work has become almost impossible for a single trader to sustain, so they build these small groups of maybe five or six people, situated in different locations, in different countries, all coordinating with each other in building and testing their robots. They've become very, very savvy.

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In the groups I've observed there was always a group leader who took main responsibility for developing the model, doing the back testing and testing on live data. And not only do they develop the model but they develop a counter model to the model and test the counter model as well. The work has become so complicated that they have to be very coordinated and there is always a hierarchy. They also have a model of profit sharing, which doesn't necessarily mean that profit is equally shared among them.

HFTR: *That's fascinating, I didn't realise that natural groups of traders were forming in this way. Coming back to individual traders, one of the things that I'd like to get your input on is the ability of humans to identify patterns of behaviour from machines and to be able to react to - and capitalise on - that. I remember speaking with a screen trader not too long ago who was trading futures spreads, and he said he could always tell when the algos and the bots really start kicking in, because there were certain identifiable patterns of activity. He shaped his trading around that, to either step back or to trade in a certain way to counter what the bots were doing. Have you seen similar behaviour during your research?*

"I've seen traders capable of looking at how the data changes on the screen and saying that's a robot, this must be an institution, this is an individual trader. They have this capability"

AP: Oh yes, absolutely. Traders definitely have this capacity, simply because spending so many hours in front of a trading screen makes human perception adapt to the flickering, to the rhythm of the data on the screen and traders become able to distinguish different patterns, even if these changes occur several times per second. For instance I've seen traders capable of looking at how the data changes on the screen and saying that's a robot, this must be an institution, this is an individual trader. They have this capability.

HFTR: *A very valuable capability to have these days, I would think!*

AP: Yes it is. Humans have adapted to the new conditions. An adaptation process is taking place there where they've learnt to recognise instantly without even pausing to think, who is the counterpart in that transaction and what sort of market data they're seeing here or there.

HFTR: *Is that a threat to the bot traders?*

AP: Yes, definitely, because the human traders are trying always to understand their next action, so their next decision depends on whether they think they're seeing a robot or not and they've reacted to adapt very quickly to this.

HFTR: *In terms of the relative strengths of humans versus robots, machines are obviously good at processing large amounts of data and following instructions, but from your research what have you seen that humans are particularly good at? And from a trading perspective, do you think that machines will evolve to the point where they can do pretty much everything humans can do?*

AP: Well first of all, market behaviour is strategic behaviour. This means at least two things, not only do you have to mobilise your resources to set goals and deal with constraints but you're also playing against counterparts, which in this strategic sense means the capacity of dissimulating your actions. This is much easier for humans than for machines, because machines will always leave a pattern. Algorithm developers are well aware of this and they are trying to find ways of hiding these patterns, of changing the patterns constantly. But the ways they're doing it are not that far evolved, at least not yet. So I would say human beings are still better at the game of recognising a pattern when it appears and at the game of dissimulating their actions, of making them appear as being something else.

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HFTR: *Do you expect that to change any time soon? Particularly with advances in machine learning and artificial intelligence and things like genetic algorithms, which are self-learning?*

AP: There is a great push in this direction, in developing trading algorithms capable of processing not only quantitative data but also qualitative data, processing not only numbers but also, for instance, stepping into processing, recognising, selecting, filtering and recognising newsfeeds and acting upon them. The downside of this is that it makes the shelf life of algorithms much shorter. You need to develop and implement new ones all the time because the older ones will be recognised and traders can act against them once they've guessed how they work. Some algorithms are used for just one week and then taken out of action when new ones need to be implemented. What I haven't seen yet, and

this would be a real progress, is algorithms being developed by machines, by other algorithms.

HFTR: *I'm sure it's only a matter of time! Final question. Do you think regulators are able to keep up with the evolution in technology in the marketplace? How they can get a better handle of what firms are actually doing and how they're interacting? Particularly in spotting manipulative activity or market abuse?*

"We are seeing this push towards having robots monitor what other robots are doing, detecting patterns of market abuse in real time"

AP: This issue has been raised at the CSFI roundtable and various possible solutions have been discussed there. One interesting development is in software for real-time monitoring of market activities. We are seeing this push towards having robots monitor what other robots are doing, detecting patterns of market abuse in real time. It's the only way to go, developing algorithms to monitor in real time the market activity of other algorithms. With this line of reasoning we will probably see regulatory agencies push up their IT activities considerably. And I think in this respect the SEC and CFTC are a little bit ahead of the European regulators.

HFTR: *Alex it's been a real pleasure talking to you. Thank you.*

