The current stock market is entirely manipulated by Flash Boys.

You have no chance at all unless the courts return the stock market to all-analog traders

Stock market crimes occur every second, but cops do not have resources to track or prosecute

Cops are restricted by their bosses who receive campaign funds from Google and Ford while, those same companies pump stocks for obscene profits

Will AI-Powered Hedge Funds Outsmart the Market?

Some hedge funds boast that AI algorithms make their trading decisions—but these systems might be more conventional than they seem.

- by Will Knight

Every day computers make many millions of electronic trades by performing delicate calculations aimed at eking out a tiny edge in terms of speed or efficiency. Increasingly, however, more significant trading decisions are being made by smarter, more autonomous algorithms.

Both established trading firms and a handful of startups are exploring whether such trading techniques, borrowed from the field of artificial intelligence, could help them outfox other traders. And anyone with money invested might well be curious to know if the trend could alter the dynamics of markets.

Quantitative hedge funds, including Bridgewater Associates, Renaissance Technologies, D.E. Shaw, and Two Sigma, have, of course, been using advanced algorithmic approaches for some years. Many of the methods employed by these businesses are found in areas of artificial intelligence research.

But the past couple of years have also seen a tremendous resurgence of interest in artificial intelligence, thanks to new machine-learning techniques—especially deep learning (involving training a large virtual neural network to recognize patterns in data)— that have made computers capable of human-level perception of images, text, and audio (see "10 Breakthrough Technologies 2013: Deep Learning"). Now the question is whether AI can do the same for financial data.

It's clear that this recent progress has caught the attention of engineers working in finance. At an important academic event for AI researchers, the Neural Information Processing Systems (NIPS), held in Montreal last December, several thousand academic and industry researchers gathered to discuss progress in developing new machine-learning algorithms. In an area reserved for poster presentations by graduate students, big tech companies, including Google, Facebook, Apple, Microsoft, Amazon, and IBM, had paid to set up recruitment tables, hoping to lure the hottest new talent to come work for them. But almost half of the companies recruiting at NIPS were not tech companies at all but hedge funds and financial firms.

One of the companies there was the large British investment firm MAN AHL, which for years has been focused on using statistical approaches to devise investment strategies. Anthony Ledford, chief scientist of MAN AHL, explains that the company is exploring whether techniques like deep learning might lend themselves to finance. “It’s at an early stage,” Ledford says. “We have set aside a pot of money for test trading. With deep learning, if all goes well, it will go into test trading, as other machine-learning approaches have.”

Trading might seem like an obvious place to apply deep learning, but actually it isn’t clear how comparable the challenge of finding subtle patterns in real-time trading data is to, say, [spotting faces in digital photographs](). “It’s a very different problem,” Ledford admits.

Academic experts also sound a note of caution. Stephen Roberts, a professor of machine learning at Oxford University, says deep learning could be good "for extracting hidden trends, information, and relationships," but adds that it "is still too brittle with regard to handling of high uncertainty and noise, which are prevalent in finance."

Roberts also notes that deep learning can be a relatively slow process, and cannot offer the kinds of guaranteed behavior that other statistical approaches offer. In general, he says, there is a certain amount of hype around the idea of AI in finance. "AI is a very broad subject," he says. "And many standard statistical techniques used are being rebranded as AI and machine learning."

That said, new financial firms that advertise themselves as AI-focused may be on to something. These include Sentient, based in San Francisco, Rebellion Research in New York, and a Hong Kong–based investment company called Aidyia.

One of the most promising uses of relatively new AI techniques may be processing unstructured natural language data in the form of news articles, company reports, and social media posts, in an effort to glean insights into the future performance of companies, currencies, commodities, or financial instruments.

Aidyia was founded by a well-known artificial intelligence researcher, Ben Goertzel, who is also the founder of Hanson Robotics and the chairman of an open-source AI project called OpenCog. Aidyia began trading last year, and Goertzel says his company's approach is far more ambitious than the techniques used by most hedge funds today, taking inspiration from evolutionary programming, probabilistic logic, and chaotic dynamics.

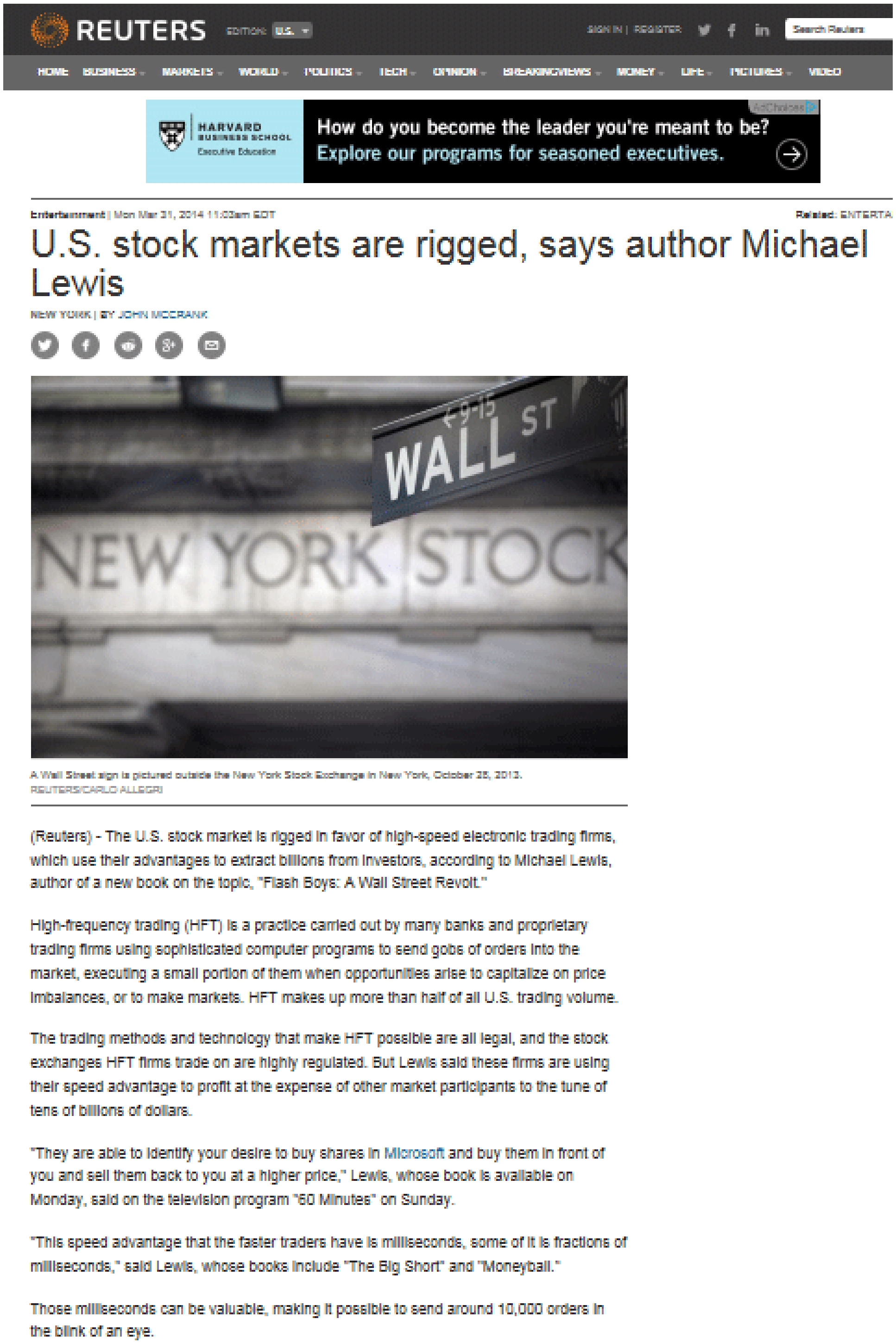
"Our system ingests a variety of inputs, including price and volume from exchanges around the world, news from various sources in multiple languages, macroeconomic and company accounting data, and more," Goertzel told *MIT Technology Review*. "It then studies how these various factors have interrelated historically, and learns an ensemble of tens of thousands of predictive models that appear to have predictive value, based on its study of historical data," which help guide the company's investments.

There is certainly a trend toward increasing automation among financial firms. Preqin, a company that provides financial industry data, reports that 40 percent of hedge funds created last year were "systematic," meaning they rely on computer models for their decisions.

Not everyone is convinced that an AI revolution in finance is imminent, however. David Harding, the billionaire founder and CEO of another British trading company, Winton Capital Management, is generally skeptical of hype over machine learning and AI. "If I squinted a little and looked at Winton, I'd say that's more or less what we've been doing for the past 30 years," he says.

Harding also remembers that a similar boom in interest in neural networks resulted in many startups during the early 1990s. "People started saying, 'There's an amazing new computing technique that's going to blow away everything that's gone before.' There was also a fashion for genetic algorithms," he recalls. "Well, I can tell you none of those companies exist today—not a sausage of them."

Ledford, of Man AHL, also has a few words of caution for anyone who thinks the latest machine-learning techniques could offer a shortcut to riches. “It’s important to remember how humbling the market can be,” he says. “I’d say don’t pat yourself on the back too much, but equally don’t get too disheartened.”



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U.S. stock markets are rigged, says author Michael Lewis

NEW YORK | BY JOHN MCCRANK

A Wall Street sign is pictured outside the New York Stock Exchange in New York, October 28, 2013.
REUTERS/CARLO ALLEGRI

(Reuters) - The U.S. stock market is rigged in favor of high-speed electronic trading firms, which use their advantages to extract billions from investors, according to Michael Lewis, author of a new book on the topic, "Flash Boys: A Wall Street Revolt."

High-frequency trading (HFT) is a practice carried out by many banks and proprietary trading firms using sophisticated computer programs to send gobs of orders into the market, executing a small portion of them when opportunities arise to capitalize on price imbalances, or to make markets. HFT makes up more than half of all U.S. trading volume.

The trading methods and technology that make HFT possible are all legal, and the stock exchanges HFT firms trade on are highly regulated. But Lewis said these firms are using their speed advantage to profit at the expense of other market participants to the tune of tens of billions of dollars.

"They are able to identify your desire to buy shares in Microsoft and buy them in front of you and sell them back to you at a higher price," Lewis, whose book is available on Monday, said on the television program "60 Minutes" on Sunday.

"This speed advantage that the faster traders have is milliseconds, some of it is fractions of milliseconds," said Lewis, whose books include "The Big Short" and "Moneyball."

Those milliseconds can be valuable, making it possible to send around 10,000 orders in the blink of an eye.