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Using Artificial Intelligence to Digest News, Trade Stocks

By Jennifer Valentino-DeVries

Watch out, stock pickers.

Researchers have been working on an artificial-intelligence computer program designed to mimic the way an analyst uses financial news. In simulated trading, the program beat the S&P 500, and when combined with quantitative stock-picking techniques, it saw a return on trades of more than 20%.

To make stock predictions, the program does what is known as “text mining” — scanning large volumes of content and analyzing the words in it. Computer-aided quantitative funds already are plentiful, but they analyze numerical data rather than text. The new program is different because it attempts to simulate what has traditionally been a human activity.

“Our approach is more like the analyst approach, simulated by a program,” said Hsinchun Chen, director of the University of Arizona’s Artificial Intelligence Lab, in an interview with Digits. “You have an analyst reading papers, looking for clues that others have not observed.”

The program, which was first reported by MIT’s [Technology Review](#), scans stock prices and financial news and buys or shorts stocks it believes will move more than 1% in the next 20 minutes. The system sells the stocks after 20 minutes.

“When you do long-term predictions, there are many variables,” Dr. Chen said. “But ... you can have an advantage if you look at five minutes, 10 minutes.”

In evaluating the meaning of a single news item, “the system won’t be as accurate as an individual analyst,” Dr. Chen said. “The computer is maybe 80 to 85% accurate when analyzing text, but it can read maybe 100,000 times the amount of data.” He said the amount of data being analyzed is one thing that would make it difficult to game the system.

The system’s creators [tested it](#) using data from five weeks in the fall of 2005 — more than 9,000 news articles and 10 million stock quotes. During that test, the system, called AZFinText, had an 8.5% return on trades, beating the S&P 500 index as well as six of the top 10 quantitative funds. When the researchers used quantitative strategies to select a portfolio and then used AZFinText to decide which trades to make, they [saw a return](#) of more than 20%.

But that test period was selected for its lack of unusual market conditions, and Dr. Chen said the evidence is still early. He expects the system to be in use in the next two to five years.

Dr. Chen and Robert Schumaker, an AZFinText creator who has since become an assistant professor at Iona College in New York, also have been working on systems that analyze finance writers’ sentiment. The researchers also are expanding beyond Yahoo Finance and traditional news outlets to analyze blogs and investor and employee forums.

The stock-trading system is not the first example of text mining. Researchers have been writing about the possibilities of such a system for years, although earlier efforts proved unreliable. AZFinText is based on earlier work that Dr. Chen did analyzing data to look for potential criminals and terrorists. “We look at sentiments of violence, hate and anger, and we look at opinion leaders in social network analysis,” he explained.

“I have put in 15 to 20 years,” Dr. Chen said. “Stock predicting is very difficult, but we finally have the ability to take a look at this.”



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