



Using artificial intelligence to predict short-term stock market performance

By Joe Pangburn, Inside Tucson Business

Published on Friday, July 2nd, 2010

Those who are savvy in the numbers and data used by traders like to think they've got some special talent, but it may not be that way for long - they may be challenged by artificial intelligence. Hsinchun Chen, director of the University of Arizona's Artificial Intelligence Lab, is working on a program



that is showing promising results in stock picking over the short term, earning as much as a 20 percent return. Chen and co-creator Rob Schumaker, a former doctoral student advised by Chen, said the Arizona Financial Text, or AZFinText, system scans stock prices and financial news and buys or shorts stocks

it believes will move more than 1 percent in the next 20 minutes. The system sells the stocks after 20 minutes. Hsinchun Chen, director of the University of Arizona's Artificial Intelligence Lab.

"This is really taking advantage of market inefficiencies," Chen said. "It is designed to take advantage of breaking news to the financial world, things the market has not absorbed entirely. Our research also looked at 10-minute periods and even shorter, but anything beyond an hour becomes a little stale."

Chen admitted this wouldn't replace a keen mind looking at one article to make a decision about one company. He said that person may be right 95 percent of the time. "But AZFinText can read through hundreds of thousands of documents, articles and stock quotes and make a decision that will be right 80 percent to 85 percent of the time," he said. "It can look at positive or negative news and survey the landscape with great accuracy." The system's creators tested it using five weeks of data from the fall of 2005. The data included more than 9,000 news articles and 10 million stock quotes.

During that test, the system had an 8.5 percent return on trades, which beat the Standard & Poor's

500 index for the time frame as well as six of the top 10 quantitative funds. When the researchers used quantitative strategies, using complex statistical techniques to build a risk-controlled portfolio, and then used AZFinText to decide which trades to make, they achieved a return of more than 20 percent. Beyond stock prediction, Chen said the AZFinText system has applications in auditing financial reports of companies, reviewing marketing results, as well as uses in accounting, and economics.

"It is using large amounts of textual data to help make better business decisions," Chen said. "This is returning me to my roots of business intelligence." Chen said he is about six to 12 months away from completing the AZFinText system and hopes another two or more years after that, he will be able to bring something to market for the everyday person. "I am in a stage of developing a more scalable system right now and I am looking to collaborate with someone in Tucson who is more hands on with more high-frequency trading," Chen said. "I think the collaboration could greatly benefit this project. I believe in another two to five years I can put together a bulletproof system that no one can beat."

Chen is known around the world for his excellence in artificial intelligence work. He is the developer of Coplink, an artificial-intelligence-driven search engine for crime characteristics that scans multiple databases for connections among names, vehicles, physical descriptions, and other aspects of a crime or criminal. More than 3,000 jurisdictions around the country currently use Coplink. It has been expanded to border protection (BorderSafe), disease and bioagent surveillance (BioPortal), and terrorism informatics research (Dark Web). Chen sold the spin-off company he founded, Knowledge Computing Company which commercialized Coplink in February of this year. He has advised the Department of Homeland Security, Department of Defense, the Department of Justice and more in digital library, digital government, medical informatics, and national security research.

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