



## **Fusion Ventures Evolves its Genetic Options with WestClinTech's XLeratorDB Analytics Package**

An analytics program that a Washington, D.C. private equity firm developed to create forecasts for its clients has morphed into a program that uses genetic algorithms to develop options trading models.

Fusion Ventures didn't intend to get into sophisticated options trading; it just sort of happened. Fortunately it happened to a team that had expertise in mathematics, computation and artificial intelligence.

Kenneth Jones, founder and managing partner at Fusion Ventures, explains that the company was actively investing in privately held health care firms and government services companies. As 2012 came to a close, an uncertain economic climate compounded by the looming threat of federal sequestration led Fusion to begin hedging its exposure to these firms by using options on the stock market to provide protection against downside risk. In developing its trading strategy, the company looked at multiple factors it wanted to consider including macroeconomic indicators, the price of the dollar, the benchmark price of crude oil, and the movement of the stocks of major government contractors such as Lockheed Martin and Northrop Grumman.

"We developed some experimental models in Excel and our trading desk started making a good deal of money," Jones said. That made him consider augmenting the company's business model.

"We invest in early stage firms and there are only so many good opportunities we come across each year. We don't like having money sitting idle on the sidelines so we asked where else could we invest, and the trading desk was one possibility."

Running models in Excel was taking a lot of his time, and he wasn't happy with guessing at the variables to use in the forecasts, or deciding how far back to look at data. Selecting variables manually and arbitrarily weighting them was less than ideal. As he was considering how to improve the process, Jones was reading Ray Kurzweil's new book, *How to Create a Mind: The Secret of Human Thought Revealed*. Inspired by the book's ideas on the ways in which genetic algorithms can mimic the way the human mind works, Jones decided to experiment by automating more of the key modeling processes.

"Working with randomly generated genetic algorithms becomes a numbers game", Jones said. The company provisioned Microsoft SQL Servers in the cloud and let them come up with their own models, randomly. Jones didn't need to spend a lot of time running the models, but he did need a tool that would run on SQL, and run fast. He licensed XLeratorDB Suite Plus and put it to work generating new algorithms.

Having previously worked extensively with Microsoft Excel, Mr. Jones understood well the software's statistical functions, as well as its limitations. XLeratorDB's LOGEST, LINEST, GROWTH, and FORECAST functions combined the same ease of use with the ability to cycle millions of predictions in a matter of days. Running at a steady state, 24 hours a day, the system is currently generating approximately 3 million new, unique predictions every day.

The value of such a large number of calculations became clear almost immediately. The firm's genetic algorithm randomly creates new models, learns which are most effective, and kills off the ineffective ones, said Jones, in a continual process of improvement.



“Each model generated is like a neuron in your brain. We taught the system to preserve the neurons that are smart or good and then kill the neurons that were predicting nonsense,” Jones explained. “The good neurons are allowed to connect with newly generated ones. It’s a little like nature, you take half of the DNA from one model and combine it with half from another and you have a new, hopefully better, model. Two out of ten models will be bad, six will be mediocre... but two out of the ten will end up being dead on; a little like venture capital investments.”

“Only in our case”, he noted, “we can do a whole lot more experimentation than a VC firm! We’re on the third iteration of the system, and, to date, it’s generated over 56 million predictions; 12 million saved and 44 million retired. We have 7,000 models that are good and 4,000 models that are very good. The server is running in the cloud 24 hours a day, 7 days a week. It’s actually fun to wake up in the morning and see what innovation was created overnight.”

When asked, “what distinguishes the good models from the poor?” Mr. Jones said, “Ahhh. Built in validation testing is part of the secret sauce. Each model is formed using a sparse data set and then analyzed against a very large data set of known data to see if, during the past few years, it might have predicted grossly wrong values. If it was too wrong, we kill it. If it tends to be a good predictor, we allow it to breed with the other good models. This is a very data processing intensive system that would not be possible without the use of XLeatorDB and SQL Server.”

“We can predict the stock price of certain equities 30, 60, 90 even 120 days in advance. Others are too volatile to be accurately predicted, but when we can predict the future with a relatively large degree of certainty, we are actively trading.”

Fusion Venture’s initial efforts used MatLab and Excel before discovering XLeatorDB.

“It wasn’t until July or Aug we started getting the SQL Server stood up. Now I am pretty comfortable that I can let it run for a while and see what it comes up with. We’ve been investing fairly small amounts of money to date but the results have been overwhelming impressive. Over the last nine months, Fusion’s option portfolio is up 75%. Now that we have it automated a little bit more, we hope we can finish the year much better than that.”

Why XLeatorDB?

Fusion Ventures bought a single license of XLeatorDB for \$1,500 and spends about \$500 a month running it full time in the cloud. “It has made us a 15X return, just with play money. XLeatorDB offers 500 times the processing that Excel is capable of, he added. And unlike MatLab it doesn’t require a huge amount of human intelligence to get it working right.”

The next challenge will be scaling out the SQL server in the cloud, he added.

Website: <http://fusion-ventures.com/>