LUSIS

A leading FinTech company looking to leverage the power of Artificial Intelligence and Data Science

LUSIS is a leading French software and IT services provider that launched more than 15 years ago. The company is well known for offering advanced software solutions to the global retail payment industry for critical online transaction processing but it also provides FX brokerage platforms and other trading related services . After launching a dedicated Artificial Intelligence department it has now started to create AI based trading strategies. We asked Fabrice Daniel Head of the AI team at the firm to tell us more about these and some of the other FinTech solutions it now offers.


Fabrice Daniel

What range of FinTech products and services does Lusis offer for Capital Market applications?

Lusis offers a wide range of FinTech products and services for Capital Markets:

- FX trading; which is our core competence
- CFDs, Options Futures and Equities
- Advanced systems and tools including algorithmic trading, market making, backtest engine and trading strategy alerts sent to mobile applications

Our product is based on a micro-service architecture providing high capacity, high availability and great flexibility. We are hardware and middleware independent with the ability to support cloud-based deployments.

Lusis are experts in Artificial Intelligence and Machine Learning. How much impact do you expect these technologies to have in the FX trading environment?

We spent 5 years using data science approaches to analyzing and improving our trading platform. In June 2017 Lusis created a dedicated Artificial Intelligence department because we think AI will change end to end trading, automatic trading, portfolio management and it will impact everything that is related to Capital Market applications. We are especially focusing on Deep Learning because of its incredible power and flexibility for problem resolutions.

Unlike the other Machine Learning approaches, for instance random forest, Deep Learning includes architecture as a concept. Today you are not just managing the number of neurons and layers of the model, and you don't just select a feed forward, recurrent or convolutional model. Many approaches are now using more and more hybrid models mixing different types of Neural Network to create more complex architectures with "building blocks" working together, each resolving a part of the problem.

You have developed solutions that use AI for the creation of trading strategies. How hard was that?

These allow the creation of models capable of discovering patterns by themselves in time series (market prices) to determine future moves. Doing this seems very straight forward and simple to do. However there are many challenges in this task making it very difficult to achieve.

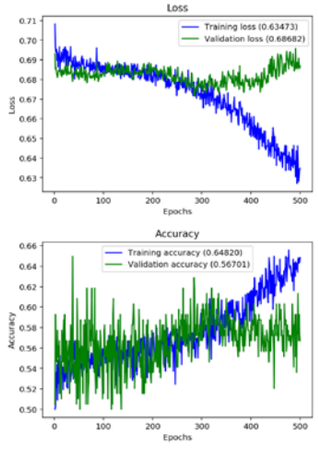
Lusis has created pure AI based trading strategies running on live data. Please tell us a little more about these and how they work?

Lusis experts have a deep knowledge of the specificity of Time Series in the field of Machine Learning. Ignoring these characteristics can lead to many errors and wrong results. In our deep research we have discovered that in the literature, a lot of the results that are presented to support the publications for high accuracy predictions of future market trends could not be reproduced. It appears that some errors were made in the supporting experiments, mostly due to the time series nature of the data that requires very specific attention, especially regarding the training sampling that can give unexpected over-fitted results.

We also found that trying to predict the market trend at any time, in any conditions on any instrument always fails because of the very high proportion of random walk on the market prices. On the other hand we established that when we concentrate the efforts on some specific periods and some market conditions, the randomness proportion reduces enough to be able to increase the prediction accuracy above a pure random guess level.

Can you tell a little bit more about the risk of overfitting?

While this is a very basic concern for every systematic trader we met people who are totally ignoring it. So basically, they create technical trading strategies with parameter optimization without separating an optimization period from a validation period. As a result, they never validate their strategy on unseen data. Doing this, there is no way to make sure that your strategy has not been affected too much from the noise. In this case, going live will deliver disappointment.



The loss and accuracy during Deep Neural Network training

In Machine Learning, the overfitting management is one of the first things people learn, although it's not at all trivial. The most important thought to keep in mind is that there is no free lunch. The good balance between over and under fitting is what we call the bias/variance trade-off. There is no absolute optimal trade-off to retain. Everything depends on the domain and the goals you have set. The most important fact of the bias/variance trade-off is that it must always be considered when you conduct such research.

When applying Machine Learning methods to Trading Strategies we always use three data sets coming from the same time series but without any overlap: a training set used in the learning step, a validation

set used to evaluate the model on unseen data and a test set used to select between different candidate models. It's most important to avoid overusing test sets to fine tune the model as it would increase the risk of overfitting by what is called "implied knowledge transfer". That specific point is often missed.

Using Deep Learning consistently with the guidelines mentioned above has allowed Lusis to create pure AI based trading strategies, running today on live data.

Many e-Forex readers are looking at how Blockchain based technologies can be deployed in the FX and electronic banking space. What work is Lusis doing in this field?

We have various projects implementing Blockchain based technologies. Blockchain based technologies provide three big main assets:

- The decentralized database; often referred to a distributed ledger
- The secured commitment multi-players system without a trusted third
- The concept of smart contract that can be used and deployed in an infinite range of situations

Having said that it is obvious that prime brokerage can make an extensive use of Blockchain based technologies for settlement, reconciliations and payment transfer. This should be the end of the big settlement factories (getting all real-time with no effort) and we are already implementing blockchain consigning for deals directly accessible by counterparty. Smart contracts can be very efficiently used for all OTC products and for investment banking where non-repudiation is a key feature.

How do you leverage the cloud and what advantages does it provide for your clients?

All of our software can be run in a cloud architecture. For Lusis it's tremendous progress as we displace Datacenters, hardware evolutions, connectivity issues and infrastructure. We make extensive use of docker and we get the best of each main provider (Azure, AWS, Google) in order to accelerate the deployment of our solutions.

What delivery model options (SaaS etc.) do clients have for accessing your FinTech services?

Our delivery model is based either on a software license model where the client is managing the operations of the software we deliver, or on an on-demand license service or software as a service (SAAS). Based on the requirements and size of the client we work together to determine the best approach.

What plans do you have to roll out new products and services for FX market participants?

We are working on the creation of very specialized modules built and delivered as micro services. With the use of Docker these micro service modules are easy to install and integrate with any infrastructure. Thus, a market participant can use them through an API, without having to think about a big integration process or changing their existing solutions.
We are also working on implementing cloud-based service for various applications:

- Artificial Intelligence module: ready to use models for predicting the trade flow, the broker expected volume for a day, the short-term trend at specific hours
- Auto-Trading environment including a back-test engine. It's an "all in one" delivered in a ready to use Docker on the cloud managed by Lusis
- Depth of market management engine - API sends a DOM (depth of market) Source, gets back a customized Market Maker DOM