

Swiss start-up and German fund manager to launch AI hedge fund

Benedicte Gravrand, Opalesque Geneva for [New Managers](#):

NNAISENSE, a Swiss start-up that develops artificial intelligence (AI) and machine learning applications, and [ACATIS Investment](#), a German long-term value investment company, have partnered and will launch a European AI hedge fund imminently.

Quantenstein

The AI application that will be used by the fund is called Quantenstein, which has been developed for almost two years and will be presented at the [NextGen Alpha conference](#) in Frankfurt on 30th March.

"What we get is a portfolio manager which is completely automated," Jonathan Masci, one of NNAISENSE's co-founders, tells *Opalesque*.

A discretionary manager comes up with portfolio positions based on what he knows, he explains, and AI tries to mimic that, but following different principles, through a system that uses analytical and time-series data.

"For example, the price or any other information that the company might expose can be turned into a training set, which is usually what you do in machine learning, consisting of inputs, the observed company data, and outputs, what should be predicted based on this observation.

"It's the same for balance sheet data. You get a time series, let's say you are going back to 1986 for any given company, and then you say, given the history of this company, at this point in time I can't predict that this company will be valuable, that this company will outperform the market, for example. And this is one things that the system can learn through the data itself."

Masci, who has a background in machine learning, AI, computer science and has always been fascinated by finance, will manage the program with his team. A team of three at ACATIS will do the rest.

"Teaming up with ACATIS was a strategic decision for us, because they were able to help us in developing the framework and then doing the marketing and addressing at least the major concerns that we receive from investors."

At this stage, the system is able to select in a fully automated way the listed companies to invest in and to pick portfolio weights. It is optimised for Sharpe Ratio, information ratio and can minimise the volatility a little. It is already capable of doing long/short investments too. A pro-forma version of the portfolio started in August 2016 is up about 12% so far. The intention here is to avoid having to rely on gut feeling, he adds.

Although AI hedge funds have [performed relatively well so far](#), there's still a lot of pressure and expectations on the newcomers. Finance, for AI, is not as straightforward as deciding whether a picture is one of a cat or not.

Deep neural networks and AI rely heavily on data in order to recognise patterns and images for example. "But if you go to the finance sector, then all these assumptions are not true anymore," he continues. "For example, the rules of the game change every time, and that means that what you learn today might not be usable tomorrow. So in the end, what we try to do now is to find rules which always work, stable rules to use for investment.

"The application is simply trained from the available data that we have. You are allowed to see only one history, and that's one of the unknowns, which is an important constraint that is true of all systems that try to learn from the past. And this is the biggest challenge that we are facing, because this is really orthogonal to what you were doing in deep learning and machine learning in general, because there you can rely on good data. But here, you get perhaps good data, but we know that history does not repeat itself. So the system has to be smart enough to take decisions which are sort of stable, in a sense that they are not affected by the particular market situation."

So in a sense, the system is making creative decisions. It is not like looking the image of, say, a cat, and decide whether or not it is indeed a cat. In finance, decision making leads to delayed reward; the system has to wait to see if the decision was right or wrong. In the mean time, it may decide to, say, rebalance the portfolio. "So you have to learn how to forecast and make decisions which only in hindsight you can assess whether they were good or bad," he adds.

"And the system is really meant to simulate what the future would be in order to make these decisions. Only at the end, when you train the system right, you go to the historical data and then you try to simulate what the system would be doingâ€¦ But there is nobody telling you that's the proper weighting for that particular company; the system has to learn through interaction with the data."

NNAISENSE

[NNAISENSE](#) is an artificial general intelligence (AGI) and very deep learning start-up with offices in Lugano, Switzerland, and a staff of 15. It was founded in 2015 by a team of five former IDSIA researchers. IDSIA is a Swiss AI lab affiliated to a

couple of universities, that focuses on machine learning, operations research, data mining and robotics.

In 1997, Jürgen Schmidhuber, one of the co-founders and its president, was at the forefront of an RNN (recurrent neural network) called Long Short-Term Memory, now used by the likes of Amazon, Apple and Google. He is known as 'the guy who taught AI to remember'.

Recent applications of RNNs include adaptive robots, handwriting recognition, keyword spotting, music composition, attentive vision, protein analysis, machine translation, speech recognition and stock market prediction.

The other co-founders gained technology firsts in very deep learning, such as Highway networks, a deep network that can be trained over 100 layers, and hold technology records, such as one for deepest recurrent networks.

Currently, NNAISENSE (pronounced 'nascence') is working on industrial applications of deep learning, such as one to detect defects and classify material for a large steel producer, and a one to drive a simulated car using vision, without a teacher.

[Alma Mundi Ventures](#), a Madrid-based venture capital firm that focuses on technology companies, invested \$2m to \$5m in NNAISENSE in January.
