Delivering transparent, uncorrelated liquid alpha

The team behind Peaq Capital discuss the firm's fusion of trading expertise and artificial intelligence with **Ian Tracy**

Boston-based Peaq Capital is an emerging CTA which runs $72m in a multi-strategy system blending counter-trend strategies with the artificial intelligence used in robotic optic pattern recognition.

The firm was founded in 2013 by Peter Harrison, a veteran floor trader and discretionary trading systems expert who, in 1985, became Tudor Investment Corporation's first prop trader under Paul Tudor Jones.

Harrison switched his focus to computerised trading systems in 2004.

After programming for Harrison since 2004, mathematician and systems developer Julian Mulla, who was previously head of research and software development for Emil Van Essen, joined Peaq as CTO in 2014.

Frank Casey, who has 41 years of experience in financial markets, the latter half in alternative investments and portfolio management, is managing director and lead business development at Peaq.

He is otherwise best known as Harry Markopolis's partner in seeking to expose the Bernie Madoff fraud.

IT **Ian Tracy (IT): Peter, given the time you spent on the floor and developing discretionary investment systems alongside some of the greats like Paul Tudor Jones, why did you make the transition to a systematic approach at PEAQ?**

And what advantages does it bring over discretionary fund management?

PH **Peter Harrison (PH):** In 2004, we came to a crossroads, almost a generational opportunity. In 2003, the markets started to shift to electronic and the liquidity started to go to electronic.

It was slow but it gave us the opportunity to say, okay, the next generation is going to be able to find ways to utilise the machines more.

Although the data wasn't quite there '03 and '04 – that didn't come until 2008 – you could see that you were going to have the opportunity to be much smarter than anyone else could be. When I saw that coming together I said okay: 'where do we do it?'

We were starting to be able to see limited markets because if you didn't have the liquidity, you couldn't have an accurate data point of which to figure out an algorithm.

But you saw it was going that way. That is when I came together with Julian in 2004.

What I wanted was a programmer to say: 'Okay, how can I take these markets and move them to a computer much smarter than people'

Now we had the ability to be able to make more simulations than there are grains of sand on earth allows us to be so much smarter.

So how lucky am I to live in a world where the evolution in money management has come around. And we embrace it. It's just so exciting.

IT **How does PEAQ distinguish itself as a systematic manager in the futures space, a space that has become dominated by large, mostly European trend-followers?**

PH Let's look at trend-following systems. It just amazes me that some of our biggest money managers are trend-following systems and yet they only make money 15% or 20% of the time. So. Wow. I want to be on the other side of that.

Well, how do you get to the other side of that?

> "Our process does not have to be unique, but our models really are"
>
> **Julian Mulla, CTO**

We buy the breakdowns and we sell the breakouts, because it's going to be a false break out 80% of the time.

JM **Julian Mulla (JM):** Basically the idea is we develop hundreds and thousands of models, which are really good models.

From these, we want to pick those models that have predictive power, that are going to work in the future.

It is difficult to tell if a specific model historically worked because of luck or if it worked because it really has some predictive power.

We do a very advanced averaging of the modelling. By averaging the models together, we expect a group of them that do not have any predictive power are going to generate signals that will cancel one another.

Only the group of systems that do have predictive power is going to come up with a signal that is biased higher towards the long side or the short side and this is how we distinguish between noise and real predictive power of the systems.

IT **Is there something specific or unique to your investment process that one should know?**

JM Our process does not have to be unique, but our models really are. The [pattern recognition] Pinnacle strategy is unique in the sense it models the relationships between markets, and benefits from the correct modelling of those relationships.

This is a more robust form of prediction compared to predicting the direction of the market.

On the other hand, the countertrend systems employ a very smart way of extracting the predictive signal from looking at a large number of systems, cancelling out the noise the systems that don't have any predictive power are generating. And creates a bias towards the long or the short side only from those systems that actually do have predictive power.

IT **Let's take a deeper dive into what's going on here with each of these systems that make up Peaq, (i.e. your two countertrend systems and your Pinnacle system).**

Can you speak to some of the mathematical underpinnings or mathematical research that has informed the systems you've built here and explain your investment philosophy. In simple terms what is it that you're doing here?

JM We are adapting the most recent research results not only from finance but from a lot of other fields, fields like pattern, handwriting and image recognitions, automatic translation all of these and applying the core ideas to financial modelling.

The strategies and the modelling are actually a cooperation between Peter and his experience with markets and my mathematical and programming skills.

As part of the formalisation, we are also basing our work and a lot of prior research that has been done by bright mathematicians and professionals.

Starting with the concept of predicting relationships and not predicting market direction. Such an approach being a more robust

approach. And a lot of papers actually do reach the same conclusion.

FC **Frank Casey (FC):** As far as Peaq's investment philosophy, I've had the privilege of working with Julian and Peter over the last two years, and watching how well they work together.

Both are extremely humble, that is the first thing. The second thing is they are inquisitive and they are willing to expand their mind and look at all new alternative potentials and to decipher whether they are additive or whether it should be ignored.

It took five years to program the countertrend trading systems. The countertrend strategy is buying the breakdowns and selling the rallies. We understand why we want to do that.

Normal people following trends are probably going to win 15% of the time.

And the risk they assume when they get into the trend is if the trend is already moving, then they have to absorb the risk from this point A to point B at the bottom. And that often wipes them out.

They are intolerant of that risk profile. And so when that actually happens it wipes them out of the trend.

Peter's genius, as a floor trader and, now as a manager of assets, is that he wants to be on the other side of that ledger.

He wants to be picking trades where he has a defined risk parameter and he might win 70% or 80% of the time. That is countertrend in a nutshell.

We have, in each market that we trade, over 300,000 algorithms. Each algorithm is a slight mutation of the other.

So it might look at a seven day moving average versus a 21 day moving average, or some higher math form of a moving average, but the purpose of looking at all these algorithms is that we are attempting to figure out, out of 300,000, the 11,000 that showed profit over forward testing from the year 2000 on.

It's a true forward test, we built this algorithm and we let the computer run. And the computer learns.

And so that is the artificial intelligence component of this thing, or the deep machine learning as we call it.

Now, out of the 11,000 algorithms that were profitable, you do not know if it was dumb luck or if they are predictive.

And that is where it comes into Julian's skill set. Taking what looks like noise, 11,000 algorithms, and batching them and using information from it, that is a higher signal-to-noise ratio, so we have a degree of confidence based upon that signal-to-noise ratio of how much we want to go into a trade.

That is the whole concept of a convergent technology called countertrend systems.

We have two different systems and they don't correlate with one another.

On the Pinnacle (strategy) side of the ledger, the pure math side of it, the divergent system is to capture non-linearity.

And it is like an option payoff. What we are looking for is not just an expansion of volatility.

We benefit in an expanding volatility market. Most managers are actually losing in an expanding volatility market.

Most managers strategies' are convergent and they therefore lose when volatility is in the initial stage of expansion.

However, what we are also looking for, which is something totally unique in the world, is divergence among these things.

Not only are they expanding but we might have a situation where one expands dramatically and the other doesn't. Or goes the other way.

So it is the relative positioning of things within sectors that have natural affinity. That is what we are forecasting.

So every 10 days, we set up on our algorithms and exposure that we believe that we have some degree of confidence by taking it back over 20 years of testing.

We look at 60 days worth of data.

In every 10 days, we are setting up an exposure to divergence. Sometimes it doesn't come and every other 10 days, we begin a reboot.

There is nothing peaked or so important or even optimised in 60 days or 20 years. These are just areas that we have selected that swe believe show robustness.

This divergent strategy does not make any of the bets, the assumptions that other hedge funds use to make money or take to make money.

We do not bet on any of their criteria, their risk criteria. We are using something totally different. It is not a trade. It is a relational exposure that we are trying to capture.

You add all three of these systems, the two convergent (countertrend strategies) and the divergent and you get something that is extremely formidable.

Most managers fall into one category or another. If they are in a convergent strategy and even if they are countertrend, they have found a half a dozen formulas or algorithms that work in most markets.

They might throw one or two out in a given market environment.

We have hundreds of thousands of algorithms and we are using deep machine learning to deduce which of those algorithms are going to offer us the best pay offs.

IT **How do you think about risk and risk management?**

JM We define it in the simplest way. There are a lot of definitions for risk.

With standard deviations of return and things that are a little bit more complex.

Our definition of risk is how much money a specific component can lose in a day.

Now, there is risk in both modelling and also in the execution.

Modelling risk is when you find trading systems that have worked well in history and don't work in the future any longer.

We tried to eliminate this risk by performing a walk forward testing of our methodology.

And walk forward testing is on every day looking only at information available up to that point.

On the other hand, we have execution risk: getting the price that we want in the market.

And in order to achieve that, we have developed our own execution strategies that work the orders in the market.

Another part of risk management is what is being modelled from us.

And on the pinnacle strategy side, we have long and short positions on the portfolio at all times.

Although the portfolio is not risk neutral, this lowers the risk of being caught off guard and a large market move.

On the other hand, in the countertrend systems we use very tight money management controls.

Tight stops and objectives to control the positions that we have in the market. ◘

> "We have, in each market that we trade, over 300,000 algorithms. Each algorithm is a slight mutation of the other"
> **Frank Casey, managing director**

Ian Tracy
Founder of Accelerate Product Partners, a marketing and analytics firm that enables investors to conduct video due diligence on top-tier investment managers.
www.accelerateproduct.com