Applications and Programming

# How artificial intelligence can inform investment decisions: A conversation with Kris Kaufman, CEO of Parallax Financial Research

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Decades before big data became ubiquitous, Parallax Financial Research began using artificial intelligence – inspired by mathematical models used in geophysics – to help its institutional clients value securities and analyze market risk.

Bloomberg recently spoke with co-founder and CEO Kris Kaufman about his unconventional career path from geophysics to financial analysis, and the surprising similarities between earthquakes and market tremors.

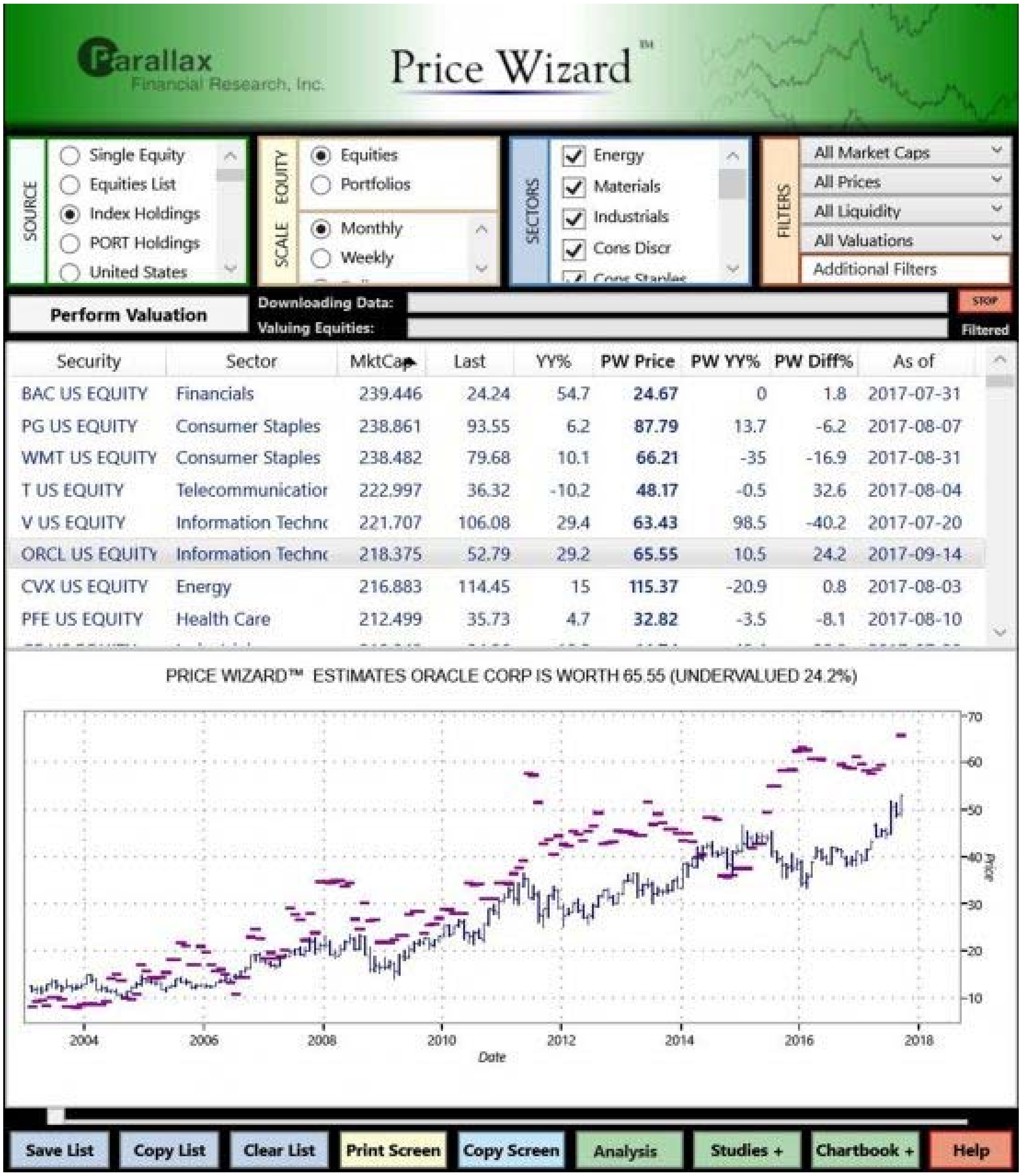
**You started your career as a geophysicist. How did you make the leap to financial analysis?**

As a geophysicist, I built mathematical models to interpret seismic signals. Those methods had many applications. Early in my career, I worked for a firm that analyzed seismic signals from underground explosions in the Soviet Union to determine the yield of its nuclear tests. After the Cold War, we transitioned to the oil industry, building 3D seismic modeling software to improve oil exploration. When Haliburton acquired the firm in the 1990s, I decided to apply some of these modeling techniques to the financial markets. The models produced useful investment forecasts, and a colleague and I formed Parallax.

**How do investors use your models?**

We have two models available in the Bloomberg App portal. One of them, Price Wizard™, is a neural network equity valuation model that has been trained to estimate the current market price for any stock in the world. It looks at a company's fundamental and economic factors relative to its sector and industry. This is key because often fundamentals vary by industry. It's a bit like valuing property. You need to know what zip code you're in before you evaluate whether a property is undervalued or overvalued. One of the side benefits of producing actual prices is that we can find the value of portfolios, Indices, and even ETFs. This is one of the most popular client features. Price Wizard™ was first invented to price IPO's though. We had no expectation that it when a stock was mispriced, it would tend to move toward value over time. This was a nice bonus.

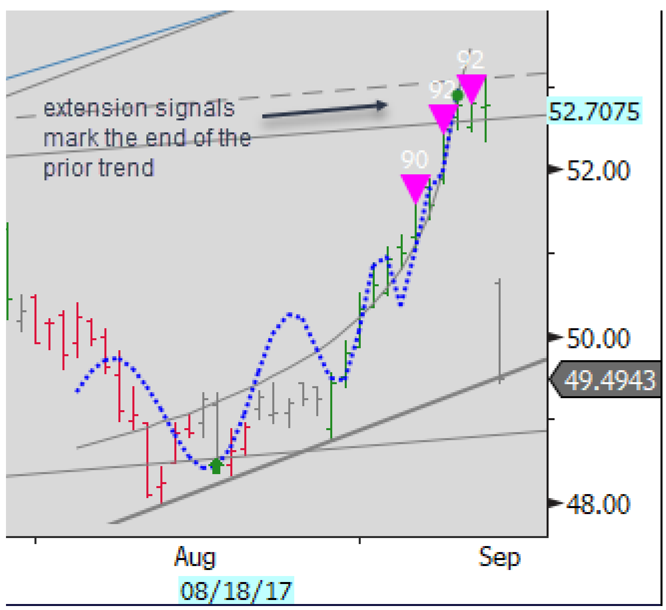
As an example, I mentioned Oracle (ORCL) in a June 16th interview when it was at $44 and our valuation was in the high 50's. Our current valuation as of Sep 14th is $65.55 and it closed at $52.79.




However, Oracle is also a good example of why clients also need our second model, ExtremeHurst™.

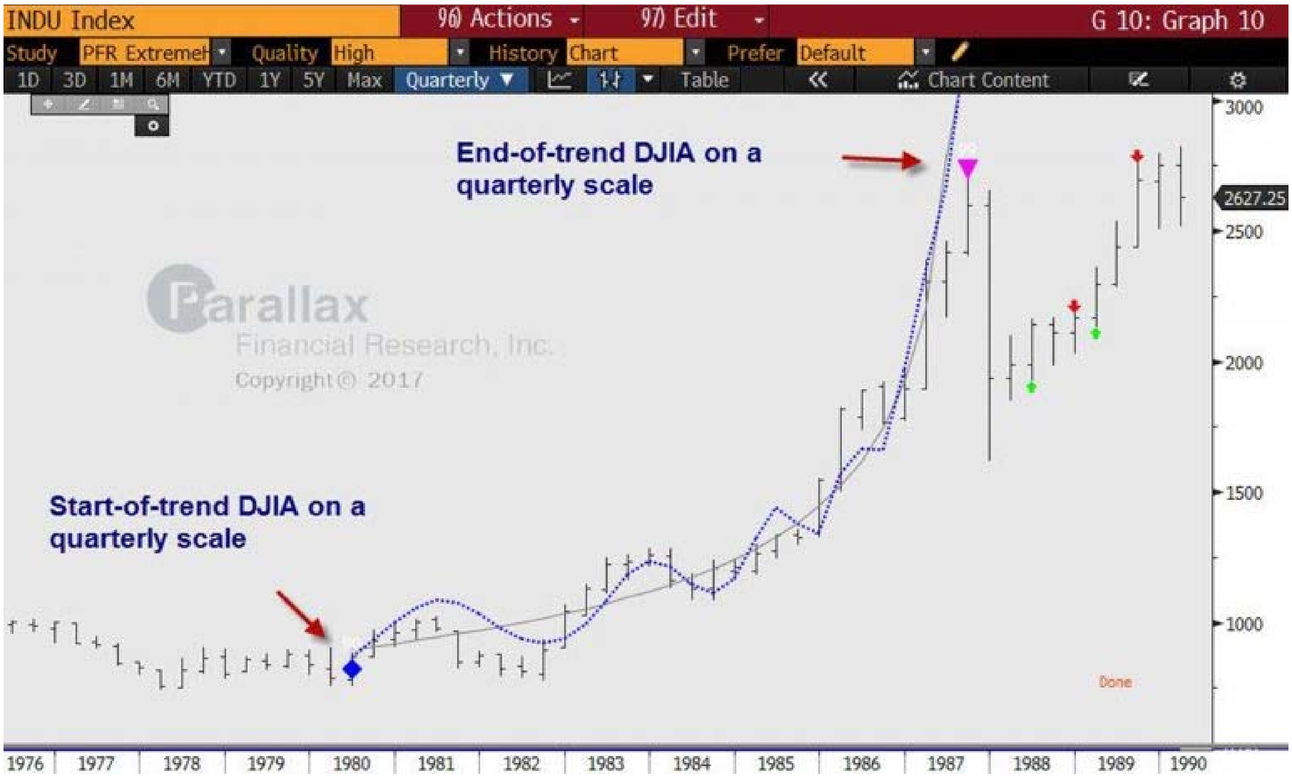
ExtremeHurst™, is a technical model that measures the crowd effect on markets. Prior to an earthquake, stress builds up along a fault to the point that it's near critical failure. Sometimes you have small tremors that relieve part of that stress, and sometimes it continues to build toward a very large event. Bubbles and busts in financial markets are similar. Investor stress builds up, and is either released in small retracements, or very large correction events. When everyone believes the same thing, or when they are vigorously in disagreement, the market becomes unstable, and is somewhat predictable for brief periods. Investors can use this tool to identify when a market is reaching a critical point.

On Sep 14th Oracle had such a critical event. What we call a top extension. These mark the end of a previous trend and the beginning of a retracement. It's a good time to take some profits. This is what it looked like on the chart:




**What's your elevator pitch?**

If I were pitching our software on an elevator, I would say we have two models: one to tell you what to buy and another to tell you when to buy it or exit from it. If there was more time and a computer though, the best strategy is to ask about a security that interests them and then do a live demo that includes historic data and current signals. Nobody believes canned signals, and you really can't blame them. But here two anyway. Among the biggest historic ExtremeHurst™ signals was the quarterly scale tops in 1929 and 1987.




## Has your business model evolved?

We started Parallax by putting out a cycles newsletter, and that led to consulting work with individual clients on what was and wasn't working with their strategies. Although most of our business is still focused on designing custom models for institutional investors, many of our potential clients were interested in just using our software on Bloomberg.  So when Bloomberg invited us to join the new Bloomberg App Portal in 2012, we jumped on it.

**What’s your advice for startups developing financial apps?**
Ease of use is key. If you’re going to put something in the Bloomberg App Portal, for example, it must be really useful and dependable. Clients will be making business decisions based on your tools, so test the technology you are building and be sure it provides a measurable and significant edge for your clients.

Our eyes are often drawn to the best chart signals and away from losers, making the proper and careful application of statistics vital. My best advice is to focus on data preparation. Each chosen predictor should be significant on its own, before being thrown into a neural net with others. Also, don’t expect too much. You cannot predict the closing price of the market tomorrow for instance, but you might be able to tell if it will close higher by a bit more than a random coin toss.

**How have your customer needs changed over the years?**

Our consulting customers often found us after they experienced a problem with their current investment strategy. We were hired to either build an overlay or an entirely new strategy that would help them generate more return with lower risk. We applied the best scientific and mathematical modeling approaches we could to help them achieve their goals. Since the economic crash of 2008 we have seen a shift in our client’s requests toward risk control. Our current consulting clients are much more eager to have complete trading strategies with entries, money management, and stop exits. Macro risk overlays are also in high demand. We have developed variable hedge strategies for two of our RIA clients as well as a very advanced smart S&P 500 option collaring model with another client.

**Fintech has changed nearly every aspect of investing. Has this impacted your models?**

One of the things I take away from being a physicist is the search for fundamental laws – what is the constant? What isn't changing is human nature.

When markets start to move in either direction you get a buildup of investor stress. People who don't want to miss out on the move, or those that are positioned the wrong way experience increasing stress. In fact, even investors who are making money from a move experience stress – the fear of losing their gains.

What you get is an avalanche of buying or selling, and that avalanche has certain features. Again, it resembles seismology. In fact, the similarities are remarkable. What do you get after an earthquake? You get aftershocks, as you do with financial markets. These crowd effects haven't changed over time because human behavior really doesn't change over time.

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