

## ARTIFICIAL INTELLIGENCE INVESTING:

Advancement is achieved not through a competition of human versus machine,  
but a collaboration of human plus machine.

Our friends at PrimeAlpha have asked us at Signum Investments, a San Francisco-based Core US Equity long/short fund manager launched in 2015 that applies quantitative and machine learning techniques to traditional fundamental active management, to write a thought piece for the PrimeAlpha community. We thought it would be interesting to expand upon a section, “Rise of the Machines: Should the Computer run the Portfolio?” of a longer thought piece that we recently previewed with PrimeAlpha.



My name is Mike, and I run a fund that uses Artificial Intelligence to buy Cannabis assets using Cryptocurrencies on the Blockchain.

*Really??*

*No.*

While a few of you readers may have started salivating at the prospect of such a fund, most readers saw this for what it was: a series of silly marketing buzzwords that are currently hot in the press. What is not silly, however, is the fact that such marketing verbiage is rampant across the modern investment management landscape, and is used to describe the quantitative techniques the so-called Market Titans employ— leaving those responsible for diligencing these funds understandably at a bit at a loss. (Hint: A.I. is not a product.) At Signum we feel the time is overdue for a responsible manager to cut through the buzzwords and help sort out the current state of machine learning and artificial intelligence in investing.

## HUMAN VS MACHINE

I’ll go on the record with a prediction: machines will not cause the extinction of the human investment professional, but will rather extend the influence of the best ones.

The **line between human and machine investing is blurring** as fundamental investors adopt tools and approaches long employed by “quants,” and as quants broaden their risk/return framework to rely more on fundamental or thematic judgment to compensate for the limitations of their quantitative models.

We’re witnessing this phenomenon because **investors are embracing the factor-based and quantitative approaches that have delivered excess returns**. Research shows that, over the past 20 years, broad market factors—such as value, growth, quality and momentum— have driven about 65% of an equity manager’s relative returns (Morningstar). Thus, investors are gravitating to quantitative managers because they believe they can thereby get more precise exposure to these “winning” factors and potentially even to as-yet undiscovered factors that correlate to excess returns.

quant /kwänt/ definition:  
shorthand for a person who specializes in the application of mathematical and statistical methods to financial and risk management problems; i.e. uses computers to tell them what to buy and sell; a.k.a. the Rocket Scientists of Wall Street

The word “quantitative” with respect to investing, however, can be divisive for a myriad of reasons that fall into three categories.

1. First, **transparency**: black box managers refuse to show their investing system for fear of copycats, leaving outsiders nervous that a blow-up awaits under the hood.
2. Second, the **scale, speed, and complexity of quantitative processes**: some are rightly concerned that computers at the helm will lead to bigger and more sudden accidents.

3. And third, **skepticism**: quants cannot replicate that unique value that human judgment brings to the investment process.

### Positive Attributes of the Quantitative Approach

In our view, **it is not a competition of human versus machine, but a collaboration of human plus machine**. In the hands of a skilled manager, quantitative techniques can be used with surgical precision to assess the current market state, the dominant factor/style regime, and even to cluster companies by operating model for more accurate relative attractiveness comparisons. This targeted application of **sophisticated techniques reveals information that the human brain is ill-equipped to uncover**. As the lines continue to blur and techniques are “borrowed” from opposing camps, **a new investment approach has emerged—Quantamental**.

## FUNDAMENTAL VS QUANTITATIVE

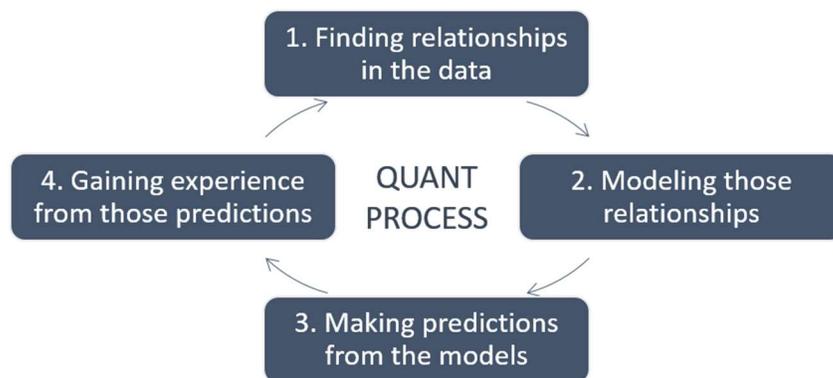
Quantitative and fundamental techniques are not competitors, but rather are two different languages trying to tell the same story.

Quantitative investing is usually considered an opposing style to fundamental investing since it relies on **disciplined computer models rather than research and intuition**. This is a misconception. Quantitative and fundamental *techniques* should not be viewed as competitors, but rather as two different and complementary lenses through which to determine the investability of an equity.

Fundamental *research* is a deep analysis with *intuition* allowing experts to recognize familiar elements in a new situation and to act in a manner that is appropriate to it-- to identify what unique data are relevant from a nearly infinite sea of information. Intuition in this sense is not the same thing as gut instinct and doesn't start with “I feel.”

Quantitative research is also a processed, deep analysis, with its algorithms able to select which of the numerous data items are truly relevant and how they are related—even if the equations describing a system are not known.

Generalized, the quant process is about finding relationships in the data, modeling those relationships, making predictions from the models, and gaining experience from those predictions.



Fundamental analysis—the process of determining the intrinsic value of a company and whether it is mispriced—is incredibly difficult, time-consuming, and expensive. The industry understands this, which is why the Market Titans are saddled with armies of research analysts and bloated costs, requiring them to burden their investors with high fees. **A good Quantamental manager, however, will leverage technology and employ smart quantitative models tempered with human judgment to achieve fundamental analytical goals for a fraction of the cost and in a fraction of the time. Not only does this yield a better investment product, but it also liberates both the manager and their investors from the high fees that have plagued our industry.**

The Quantamental manager blends quantitative and fundamental techniques by complementing their robust quantitative processes with a pragmatic and intuitive fundamental understanding of markets, providing for unique insights and portfolio differentiation.

## OPERATIONS VS ASPIRATIONS

## Rise of the Machines: Should the Computer run the Portfolio?

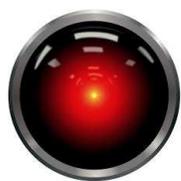
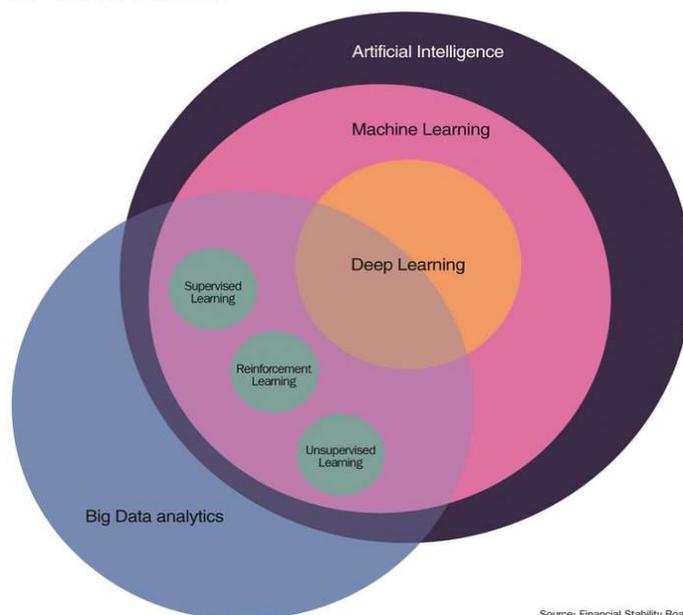
All tasks for which following a recipe leads to a known result, i.e. for which an algorithm can be written and executed, are now done better by computer. Computers are good at making complex calculations (running their algorithms) against finite, fixed rules. Computers don't suffer from important limitations that plague human beings. They're not restricted by biology, they don't get tired, they can crunch numbers for long hours, and they're exceptionally smart while doing repetitive mathematical tasks.

Does this mean computers should manage your portfolio? No. The underlying logic of the system is lacking, which makes investing an entirely different problem than getting from point A to B as in Google Maps. We don't yet know how to endow computers with the kind of common sense understanding of the everyday world that underpins human general intelligence or human nature. Nor have we identified the fixed rules that can explain how the market evolves from one market regime to the next.

**There is an unfortunate assumption that just because computers are faster than humans, they must be smarter. Computers are obviously incredibly powerful tools, but without a sound investment framework and absolutely precise parameters and objectives, they will achieve results indistinguishable from noise that will decay quickly over time.**

Some managers are seeking to use the new software beyond its proven capabilities. One of the biggest buzzwords in finance is "Artificial Intelligence" (A.I.). A.I. is software that can learn from data or experiences to make predictions—even when the equations describing the system itself are unknown. It is the stuff of science fiction that is beginning to overlap with science fact—and therein lies the rub.

## AI Deconstructed



**Users are having trouble distinguishing the fine line between what an A.I. can do versus what in their process it actually does do.** An A.I. can discover connections in the data that would be more complicated or nuanced than a human would find— but **it cannot explain how it reached a particular conclusion to its human creators and users, so there is no way for A.I. fund managers to confirm that the A.I. is extracting some valuable signal from the noise.**

## Spurious Data Relationships

In databases large enough, one can find spurious, fleeting, transient relationships with no grounding in economic theory. Sometimes, the results are just garbage. For example, the money spent on pets in the U.S. has a 99.8% correlation with the number of lawyers in California. (I know that some of you are letting the mental gears turn trying to come up with a plausible underlying reason for this connection. You know who you are...) Not surprisingly, pure A.I. funds are shuttering for performance reasons. After all, the consequences of a bad recommendation for a stock purchase or portfolio allocation in a hedge fund are more substantial than a wrong "recommended for you" from Amazon.

## Why the Rise of the Machine

The easy availability of cheap AWS CPU Cores to spin-up, off-the-shelf equity alpha generation and risk management tools, PhD's to perform data analysis, and more sophisticated quantitative techniques and machine learning tools, have lowered the barrier of entry to asset management while giving the illusion of intellectual and scientific rigor. With the proliferation of quantitatively driven funds, these strategies are having difficulty differentiating their products, and are now relying on marketing the sheer dozens of "quants" they have working for them, regardless of how "quanty", how well-trained, or how competent. In reality, a mountain of data is easy to generate. **Generating data that a portfolio manager can act on with**

**confidence**, however, is an incredibly difficult thing to do. This is not a data science problem, but rather one more intimately core to investing: identifying and precisely defining an **actual persistent edge** that can be harvested in a disciplined manner over time. If one indeed has a truly clever investment product, the machines will generate **actionable data** to augment returns. If, however, those concepts are flawed and the perceived edge was amorphous, spurious, or fleeting before implementing the machines, the precision to which the machines will work out the problem will only maximize the existing errors leading to inconsistent results. No amount of computing power will help.

### Rooting for the Innovative Quantamental Manager

Considering that we can generate actionable data, you should be rooting for the innovative Quantamental manager. The successful implementation of machine learning and quantitative strategies increases the proficiency of the industry overall—and you should be ready to diligence more of it in the future. **The Red Queen Effect** is an evolutionary theory that suggests entities must constantly adapt, evolve, and proliferate in order to survive while pitted against ever-evolving opposing entities in an ever-changing environment. The phenomenon's name is derived from a statement that the Red Queen made to Alice in Lewis Carroll's *Through the Looking-Glass* in her explanation of the nature of Wonderland: “Now, here, you see, it takes all the running you can do, to keep in the same place.” Applied here, this means is that as the overall skills in the entire industry increase on an absolute basis, the standard deviation of that skill across the industry actually narrows. **The emerging Quantamental manager will force other dominant firms to continue to co-evolve, while forcing weaker others into extinction.**

There are inevitable conclusions and some broader truisms at work here.

- First, it is fair to evaluate any investment manager, whether human or machine, by the results they produce given the objectives they seek and the inputs they use.
- Second, and most critical, long/short managers will achieve the best outcomes when they utilize quantitative and machine-learning tools to tackle specific complex tasks based on sound fundamental economic principles— guided by them, the human experts.

In sum, the lines between quantitative and fundamental investing have blurred such that a new style has evolved, Quantamental, providing for unique insights and portfolio differentiation. While scale, speed, and capabilities of computers and algorithms are impressive, human judgment in the design and oversight of the investment process is still required. Quantitative techniques are most powerful when applied to specific, complex tasks; guided by human experts; and based on sound fundamental economic principles. This is the best and most powerful way to leverage technology for an active long/short fund manager.

Reach out to Signum ([info@signuminv.com](mailto:info@signuminv.com)) if you would like the longer more detailed thought piece, which covers the tremendous headwinds created by market volatility (the engine of destruction) and the steps required to maximize an investor's wealth potential. These steps – maximize geometric median returns, utilize active equity long/short as an engine of growth, invest with an emerging manager for a multiple win opportunity, and correctly harness the power of quantitative and machine learning tools– are designed to help investors put the odds in their favor to maximize potential wealth.

#### Special Thank You To Our Contributor:

**Mike Scafati**  
 Managing Partner, CIO  
 Signum Investments, LP  
 P: +1 (415) 472-9957  
 E: [mike@signuminv.com](mailto:mike@signuminv.com)

## SIGNUM INVESTMENTS

Signum Investments is a San Francisco-based Core US Equity long/short fund manager launched in 2015 that applies quantitative and machine learning techniques to traditional fundamental active management.

**Important Disclaimers:** This article (the "Article") is for informational purposes only and does not constitute an offer to sell or a solicitation of an offer to purchase any investment or any securities. This Article does not constitute investment advice and is not intended to be relied upon as the basis for an investment decision, and is not, and should not be assumed to be, complete. Readers should make their own investigations and evaluations of the information contained herein. The information contained herein does not take into account the particular investment objectives or financial circumstances of any specific person or entity who may receive it. Each reader should consult its own attorney, business adviser and tax adviser as to legal, business, tax and related matters concerning the information contained herein. Except where otherwise indicated herein, the information provided herein is based on matters as they exist as of the date of preparation and not as of any future date and will not be updated or otherwise revised to reflect information that subsequently becomes available, or circumstances existing or changes occurring after the date of preparation. Certain information contained in this Article constitutes "forward-looking statements," which can be identified by the use of forward-looking terminology such as "may," "will," "should," "expect," "anticipate," "target," "project," "estimate," "intend," "continue" or "believe," or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events or results may differ materially from those reflected or contemplated in such forward-looking statements. Readers should not rely on these forward-looking statements. Certain information reflects subjective determinations which may prove to be incorrect. There can be no assurance that the estimates or projections will be accurate or that historical trends will continue. In considering the prior performance information contained herein, readers should bear in mind past performance is not necessarily indicative of future results. **All rights reserved. The material may not be reproduced or distributed, in whole or in part, without the prior written permission of PrimeAlpha LLC.**