



A Conversation with Michael Oliver Weinberg, CFA

The Times They Are A-Changin' – A conversation about Autonomous Learning Investment Strategies

An Interview with Michael Oliver Weinberg by Mehrzad Mahdavi, Executive Director, FDP Institute

Recently, FDP Executive Director Mehrzad Mahdavi interviewed Michael Weinberg, founder of Autonomous Learning Investment Strategies (ALIS), regarding current trends in investing, which we refer to as the third wave of investment strategies. The first and second waves were characterized by the discretionary traditional quantitative investing. ALIS, is driven by smaller funds that leverage recent advances in artificial intelligence (AI) and machine learning, the explosion in data availability and inexpensive cloud computing to generate alpha at lower costs.

The focus of this interview, *The Times They Are A-Changin'*, pays homage to Nobel Prize winning poet and song-writer, Bob Dylan. The theme exemplifies the mega trend of disruption in the finance sector driven not just by the Wall Street but by academia and Silicon Valley. Many published articles by AIMA, CAIA, CFAI, P&I and others speak of the disruptive forces of AI/Data Science in the industry; therefore, we will assume readers can reference those for background. For this interview, I have curated the most frequently asked questions and Michael's responses.

Mahdavi: What are your current thoughts or key messages on the direction of hedge funds with respect to Artificial Intelligence?

Weinberg: My current thoughts on AI have not changed. The application of machine learning (ML) to hedge funds, finance and all business for that matter is to use a baseball phrase—in the first inning. Just as ML revolutionized Go, it will revolutionize industry.

I was a research contributor to a World Economic Forum paper on AI, which they include as a key factor in the fourth industrial revolution, and I don't disagree with that. In his book, *AI Superpowers* by Kai Fu-Lee, which though I believe is not unbiased towards the author's home country, nonetheless makes a few valid points regarding the impact of AI on future opportunities in the workplace. I do believe there is a solution for society to co-exist peacefully with AI, and

that will require massive education (and re-education) in Science, Technology, Engineering and Mathematics (STEM). Jim Simons at Renaissance Technologies had the right idea decades ago, long before most of the rest of Wall Street, hiring scientists and mathematicians as investors. The world's future investors are likely to be educated in STEM and investing rather than the status quo, often purely educated in business.

Mahdavi: Are there any material changes or additions to your perspective/key messages? If so, what are they?

Weinberg: I would say more evolution than revolution in my thesis on the future of investing. For example, more than ever, discretionary managers are beginning to appreciate the importance of data. The best discretionary managers have been sourcing alternative data for some years now; however, many others are now starting to appreciate the need to do this. The funds that formerly were not paying attention to alternative data are increasingly hiring data scientists to source and incorporate this data. However, just as many are finding there are at least three primary challenges: 1) It is difficult to find data that has not experienced alpha decay to the point beyond its cost and that has sufficient duration to be statistically significant, 2) shortage of [and growing] professionals that can fill the gap between data scientists and financial professionals and 3) to incorporate Big Data into a discretionary research process. Although systematic managers also are up against the first two challenges, the third is not an issue for them. And as we have stated historically, in the future we believe these managers will have an advantage in the new era of alternative data and machine learning.

Mahdavi: In your Data De Groove article, published by CAIA, you mention that ALIS managers "may philosophically believe that data should be gratis." How do you (and they) square their use of alternative data with growing privacy and ethical concerns?

Weinberg: Data procurement and usage must be entirely ethical. First, no data with Personal Identification Information (PII) may be used by managers. Second, even if there isn't PII data, managers may not integrate multiple data sources to triangulate data and determine PII. Third, data may not be procured in a way that is inconsistent with the data sources requirements of distribution or usage. There's a lot more to it, but this is all to ensure that managers act ethically and without infringing on rights to privacy. To this extent, regarding paid for data,



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Dr. Mahdavi is a technology entrepreneur with focus on breakthrough digital transformation for the Fintech and the energy sectors. He is a recognized expert and frequent keynote speaker on application of AI, IoT, and Cloud computing in financial sector and industries.

Dr. Mahdavi managed major global businesses in the energy sector. He is currently the executive director of the Financial Data Professionals Institute (FDPI), a non-profit organization founded with CAIA. Mehrzad holds a PhD in Nuclear Science and Technology from the University of Michigan a Bachelor of Science in Electrical and Electronics Engineering from the University of Illinois at Urbana-Champaign.



**Michael Oliver Weinberg,
CFA,
Managing Director,
Head of Hedge Funds
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For 25 years Michael has invested directly at the security level and indirectly as an asset allocator in traditional and alternative asset classes. He is a Managing Director, Head of Hedge Funds and Alternative Alpha, at APG. Michael is also an Adjunct Professor of Economics and Finance at Columbia Business School, where he teaches Institutional Investing, an advanced MBA course that he created. Prior to that, Michael was CIO at Protege Partners and MOV37, a portfolio manager at Soros and Credit Suisse and an analyst at Dean Witter. Michael has a BS from New York University and an MBA from Columbia Business School.

The Financial Data Professional Institute (FDPI) was established by the CAIA Association to address the growing need in finance for a workforce that has the skills to perform in a digitized world where an increasing number of decisions will be data and analytics driven. The FDP curriculum introduces candidates to central concepts of machine learning and big data, including ethical and privacy issues, and their roles in various segments of the financial industry to boost and integrate quant knowledge into analytics' skills.



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the best managers we know have their own multi-page checklist that data sources must fill out to ensure the usage meets all ethical and privacy standards. In fact I have been encouraging one of the not-for-profit, non-asset management organizations I'm affiliated with to come up with a list of ethical standards in the procurement and deployment of alternative data for hedge fund managers.

Mahdavi: How transparent are AI/ML strategies to institutional investors?

Weinberg: Transparency of ML strategies ranges from very little to extreme openness. Although some of the world's largest managers are not always the most transparent, some are more transparent than others. Smaller and emerging managers are often quite transparent with non-disclosure or confidentiality agreements because they have to be if they are to attract investors, raise assets and grow their funds and businesses. Some of these managers will even go as far as showing investors the code. Though of course the investors need to be fluent in Python or R, or even better, have a PhD to go through it. Aside from the code, technological elements, a PhD researcher and using some ML to analyze and evaluate systematic managers using ML, the due diligence process is not materially different than it is for a discretionary manager.

Mahdavi: How do you ensure integrity and the investor's ability to see into the 'black box'?

Weinberg: It is funny because investors who are averse to systematic strategies often assert exactly that, "But it is a black box—how do you know what if anything is inside of it?" Our retort is "What's a bigger black box than a human investor's mind?" How does one know what's inside of that? Or that today a discretionary investor states that he or she likes value stocks, but then tomorrow that same investor doesn't change his or her mind and like growth stocks?

The integrity of a systematic fund is no different than the integrity of a discretionary fund. In that respect with both types of funds it's binary. Either there is integrity between the PhD who coded the systematic fund because the program will do what it is coded to do, and there is integrity among the discretionary manager, who will do what he or she said, or there isn't.

With systematic funds, broadly speaking, there are two types. Those that are coded to do certain things, and those where the machine determines what to do based on the data and machine learning. The more it is the former, the more you can

understand what the fund is doing and why. The more of the latter, you understand less of what the fund is doing, but even there, depending on how much data, the dimensionality and the machine learning techniques, you may still have a sense as to why the system is doing what it is doing. Even in the formerly most opaque machine learning techniques, such as deep learning or neural networks, progress is being made in understanding, visualizing and explaining what they are doing and why. For example, we know of and have met with top scientists in Israel with competing theories in explaining neural nets. And there are companies in Silicon Valley that we have met with who are developing pictorial explanations of why neural networks do what they do.

Mahdavi: Who is accountable for any unintended consequences of an algorithm and/or AI gone rogue?

Weinberg: Though there are some high-profile views in the world about AI going rogue and threatening humanity, with AI driven funds this is not likely to be the case. Ultimately these AI driven systems are programmed and may learn from data, both old and new data, but what they do will be a function of a confluence of that, the programming and data. They will have a basis for making decisions. That basis may be right or wrong, good or bad, profitable or unprofitable, but they will not 'go rogue.' In the case of hedge funds using AI, the investors would risk losing their capital if there is "overfit" or other technical issues. But this is unlikely because the better AI driven investment systems all have strict constraints, just as discretionary systems do. These constraints typically include net, gross, sectoral, factor, position, market cap and other limits, as discretionary funds have. Logical constraints typically limit adverse or unintended mismatches and may force returns to be driven by alpha rather than beta. Moreover, if these constraints are set well ex ante, they may result in higher quality returns, i.e. more up than down returns and higher up than down returns and limiting losses, whilst maintaining upside capture.

Mahdavi: How do we close the gap between data scientists and financial professionals to come up with a financial professional of the future?

Weinberg: Shortage of data scientists and talent is real. This has been identified as the main barrier in scale deployment of AI/ML in the financial industry. According to the report by McKinsey, there will be a

major shortage of "translators" to connect the data scientist and financial professionals. To achieve this objective, we need to provide training and education to produce the financial professional of the future. I am on the advisory board of the Financial Data Professional Institute, FDP (fdpinstitute.org). FDP has produced a specialized program and designation, called FDP, that is designed by the financial professional for the financial professionals. These types educational initiatives will address the shortage of talent and enables finance professionals to actively participate in the future of the industry.

Mahdavi: Can ALIS accommodate Responsible Investing (RI)?

Weinberg: There are multiple ways ALIS could accommodate Responsible Investing. Let us start with the basics, exclusion. For starters, the system could exclude companies that manufacture cluster bombs, nuclear weapons and tobacco manufacturers. Similarly, any other undesirable industries could be excluded. Alternatively, ALIS managers may optimize their system such that these excluded industries may be shorted, under the premise that society would be better off if these businesses were no longer economically viable.

An ALIS manager could also optimize a portfolio such that companies that contribute to the United Nations Social Development Initiatives, SDIs are the opportunity set for the longs and companies that do not contribute, or worse are antithetical to the SDIs are either not invested in or are shorted. Yet another way ALIS managers could accommodate RI is through scoring names based on attributes, such as Environmental, Social and Governance, ESG. ALIS managers could long the best ESG companies and not invest in or short the worst. With all of these RI proposals, the ALIS manager would also account for other factors, including fundamental and possibly technical factors.

As Bob Dylan album and song, *The Times They Are-A-Changin'*, the financial markets are going through the disruption over the next few years for better efficiency. We should provide means to re-skill / skill-up the industry to successfully make the transition.

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