



Working with Intelligent Machines (4 of 5)

This is the fourth article in a five part series on AI in Finance. [Access the previous article here.](#)

Discussions of artificial intelligence usually bring up one of three scenarios in people's minds:

1. **The Terminator Scenario:** AI becomes sentient and overthrows humanity in a violent revolution. Machines are dangerous and our enemy.
2. **The Jetsons Scenario:** AI exists in a state of total subservience to humans, like Rosie the robot maid in the Jetsons. Machines are our servants
3. **The Automation Scenario:** AI slowly replaces human workers until there are no jobs left. Society experiences massive upheaval as we adjust to a post-work society. Machines are a replacement for human labor.

Machines will destroy us, serve us, or replace us. Those are the three dominant ways society imagines humanity relating to artificial intelligence.

The Terminator and Jetsons scenarios have been the most widely discussed in fiction and entertainment (hence their names), but it's the automation scenario that now dominates contemporary thinking around AI. Every day brings another breathless prediction that robots will take all our jobs. One of the most prominent advocates of this position is Tesla (TSLA) CEO Elon Musk, who [told the National Governors Association](#):

"There certainly will be job disruption. Because what's going to happen is robots will be able to do everything better than us. ... I mean all of us."

When Musk says "robots will be able to do everything better than us," he makes two key errors. He overestimates robots, and he underestimates humans. AI will not replace humans, and it won't destroy us or be totally subservient to us either. Instead humans and AI will work together¹, combining each other's strengths and compensating for each other's weaknesses to create jobs and achieve results that are presently unimaginable.

The Limitations of AI

As we discussed in "[Cutting Through the Smoke and Mirrors of AI on Wall Street](#)" (and elaborated on in the [second](#) and [third](#) articles of this series), AI has a long way to go before it can compete with human intelligence. Machines may be able to defeat humans in games like Chess and Go, but they can't compete with humans in areas such as logical intuition, much less creativity and innovation. Machines are savants: incredibly skilled at specific tasks but limited in their overall cognition.

The idea that AI will replace all human workers ignores the complexity and variability of most jobs. Sure, you can train a machine to do x, but most jobs require people to seamlessly juggle tasks x, y, and z, often at the same time and in an open environment that is not immutably structured (i.e. a chess board).

Even if AI does advance to match humanity's level of general intelligence, it will still need to learn how to apply that intelligence. Smart machines need even smarter teachers, and humans are the best teachers around.

¹ Harvard Business School features the powerful impact of our research automation technology in the case [New Constructs: Disrupting Fundamental Analysis with Robo-Analysts](#).



Figure 1: Teaching Machines



Sources: [xkcd](#)

Machines are undoubtedly superior to humans at a large number of confined or routine tasks, but they will never “be able to do everything better than us.”

Machines Can Empower Us & Make Us More Human

No one understands the pain of being surpassed by a machine better than Gary Kasparov. When the reigning world chess champion was defeated by IBM (IBM) supercomputer Deep Blue in 1997, Newsweek described it as “[The Brain’s Last Stand](#).”

Today, Kasparov sees his defeat differently. He believes the advancement of artificial intelligence represents a boon to humanity, even if machines do cause some disruption to the labor market. The more that AI replaces routine jobs, the more it frees up humans to dream up jobs that could never have existed in the past, as he wrote in an [essay last year](#) in the *Wall Street Journal*.

“Machines that replace physical labor have allowed us to focus more on what makes us human: our minds. Intelligent machines will continue that process, taking over the more menial aspects of cognition and elevating our mental lives toward creativity, curiosity, beauty and joy. These are what truly make us human, not any particular activity or skill like swinging a hammer—or even playing chess.”

Think of the jobs that exist today that would have been unimaginable 20 years ago. Now think of the jobs that will exist 20 years from now. Just like it would be hard to explain the concept of a social media manager to someone



from 1998, so too is it difficult to comprehend the jobs that will exist in 2038. As Box (BOX) CEO Aaron Levie explained [on Twitter](#):

“AI can seem dystopian because it’s easier to describe existing jobs disappearing than to imagine industries that never existed appearing.”

Humans are wired to fear the unknown. The loss of jobs that already exist to machines frightens us more than the potential jobs those machines will create, even though the new jobs will make use of our talents in ways that are more rewarding and productive.

How We Can Work with Machines

The cycle above—machines taking over human jobs, which then frees those humans to create new jobs—has existed for centuries. Agricultural advancements allowed farmers to move to cities and become artisans and merchants. The Industrial Revolution displaced those artisans and created jobs building railroads and steamships. Throughout history we have made technological advancements that replaced some jobs and created new ones.

What’s different about AI is our relationship to the technology. AI is not a tool where the human is in complete control. AI gets some autonomy. It acts in ways that it’s not explicitly told to and makes recommendations that humans might not anticipate or fully be able to understand. People don’t just need to learn how to use AI, they need to learn how to work cooperatively with it.

Many large financial firms have already shown an understanding that AI is best used as a complement to human labor, not a replacement for it. When BlackRock (BLK) announced last year that it would rely more heavily on algorithms to pick stocks for its funds, much of the [news coverage](#) interpreted the move as machines replacing traditional fund managers.

BlackRock, however, insists that’s not the case. Cofounder Rob Kapito outlined the company’s view on AI at the [Barclays New Frontier Conference](#) last November:

“It’s not going to replace humans. I believe it will be human and machines.”

The numbers bear Kapito’s statement out. Even though the company’s shift to more algorithmic funds led to 36 employees leaving, the firm has actually added nearly 700 employees (5% increase) over the past year. It’s not just tech talent either; BlackRock has placed an emphasis on hiring [liberal arts majors](#). As technology changes the finance industry, employers need to start looking for different skillsets.

[Research shows](#) that cooperation between humans and machines thrives when humans leverage our uniquely human skills: intuition, pattern recognition, and reading implicit signals. Relationships thrive when both parties have a clear and early understanding of what to expect from each other.

AI has the potential to make us more human, not less, when developed with these goals:

- 1. Practice Transparency:** In a [previous article](#), we explained the challenges for humans to work with black boxes. Programmers and subject matter experts (SMEs) need to work together to ensure the abstract goals for the machine are properly and clearly expressed in the code. In practice, achieving this goal requires disciplined adherence to clear, documented processes for communication and code writing that both the programmers and SMEs understand.
- 2. Understand Strengths & Weaknesses:** Machines and humans are most effective together when machines perform tasks that play to their strengths (sorting through large amounts of data, statistical analysis, identifying patterns, etc.) while humans focus on their strengths (putting data in context, interpreting results, understanding priorities, etc.). Get the little things right before adding complexity. Don’t expect too much from your machines or your humans.
- 3. Integrate Diverse Minds:** If there’s one theme we keep coming back to in this series, it’s the need to integrate technological expertise and with subject matter expertise. The companies that are succeeding with AI enable programmers and SMEs to communicate effectively across all levels of the organization.

These steps can help companies reframe AI as way to make humans more productive rather than as a way to replace them. In the [words](#) of famed investor Paul Tudor Jones:

“No man is better than a machine, and no machine is better than a man with a machine.”



This article is the fourth in a five-part series on the role of AI in finance. The first, "[Cutting Through the Smoke and Mirrors of AI on Wall Street](#)" highlights the shortcomings of current AI in finance. The second, "[Opening the Black Box: Why AI Needs to Be Transparent](#)" focuses on how transparency is crucial to both developers and users of AI. The third, "[AI Has a Big \(Data\) Problem](#)" details the difficulty machines have in reading large amounts of unstructured data. The final article will focus on how AI can lead to significant benefits for both financial firms and their customers.

This article originally published on [February 6, 2018](#).

Disclosure: David Trainer and Sam McBride receive no compensation to write about any specific stock, sector, style, or theme.

Follow us on [Twitter](#), [Facebook](#), [LinkedIn](#), and [StockTwits](#) for real-time alerts on all our research.



New Constructs® - Research to Fulfill the Fiduciary Duty of Care

Ratings & screeners on 3000 stocks, 450 ETFs and 7000 mutual funds help you make prudent investment decisions.

New Constructs leverages the latest in machine learning to analyze structured and unstructured financial data with unrivaled speed and accuracy. The firm's forensic accounting experts work alongside engineers to develop proprietary NLP libraries and financial models. Our investment ratings are based on the best fundamental data in the business for stocks, ETFs and mutual funds. Clients include many of the top hedge funds, mutual funds and wealth management firms. David Trainer, the firm's CEO, is regularly featured in the media as a thought leader on the fiduciary duty of care, earnings quality, valuation and investment strategy.

To fulfill the Duty of Care, research should be:

1. **Comprehensive** - All relevant publicly-available (e.g. 10-Ks and 10-Qs) information has been diligently reviewed, including footnotes and the management discussion & analysis (MD&A).
2. **Un-conflicted** - Clients deserve unbiased research.
3. **Transparent** - Advisors should be able to show how the analysis was performed and the data behind it.
4. **Relevant** - Empirical evidence must provide [tangible, quantifiable correlation](#) to stock, ETF or mutual fund performance.

Value Investing 2.0: Diligence Matters: Technology is Key to Value Investing With Scale

Accounting data is only the beginning of fundamental research. It must be translated into economic earnings to truly understand profitability and valuation. This translation requires deep analysis of footnotes and the MD&A, a process that our [robo-analyst technology](#) empowers us to perform for thousands of stocks, ETFs and mutual funds.



DISCLOSURES

New Constructs®, LLC (together with any subsidiaries and/or affiliates, "New Constructs") is an independent organization with no management ties to the companies it covers. None of the members of New Constructs' management team or the management team of any New Constructs' affiliate holds a seat on the Board of Directors of any of the companies New Constructs covers. New Constructs does not perform any investment or merchant banking functions and does not operate a trading desk.

New Constructs' Stock Ownership Policy prevents any of its employees or managers from engaging in Insider Trading and restricts any trading whereby an employee may exploit inside information regarding our stock research. In addition, employees and managers of the company are bound by a code of ethics that restricts them from purchasing or selling a security that they know or should have known was under consideration for inclusion in a New Constructs report nor may they purchase or sell a security for the first 15 days after New Constructs issues a report on that security.

DISCLAIMERS

The information and opinions presented in this report are provided to you for information purposes only and are not to be used or considered as an offer or solicitation of an offer to buy or sell securities or other financial instruments. New Constructs has not taken any steps to ensure that the securities referred to in this report are suitable for any particular investor and nothing in this report constitutes investment, legal, accounting or tax advice. This report includes general information that does not take into account your individual circumstance, financial situation or needs, nor does it represent a personal recommendation to you. The investments or services contained or referred to in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about any such investments or investment services.

Information and opinions presented in this report have been obtained or derived from sources believed by New Constructs to be reliable, but New Constructs makes no representation as to their accuracy, authority, usefulness, reliability, timeliness or completeness. New Constructs accepts no liability for loss arising from the use of the information presented in this report, and New Constructs makes no warranty as to results that may be obtained from the information presented in this report. Past performance should not be taken as an indication or guarantee of future performance, and no representation or warranty, express or implied, is made regarding future performance. Information and opinions contained in this report reflect a judgment at its original date of publication by New Constructs and are subject to change without notice. New Constructs may have issued, and may in the future issue, other reports that are inconsistent with, and reach different conclusions from, the information presented in this report. Those reports reflect the different assumptions, views and analytical methods of the analysts who prepared them and New Constructs is under no obligation to insure that such other reports are brought to the attention of any recipient of this report.

New Constructs' reports are intended for distribution to its professional and institutional investor customers. Recipients who are not professionals or institutional investor customers of New Constructs should seek the advice of their independent financial advisor prior to making any investment decision or for any necessary explanation of its contents.

This report is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would be subject New Constructs to any registration or licensing requirement within such jurisdiction.

This report may provide the addresses of websites. Except to the extent to which the report refers to New Constructs own website material, New Constructs has not reviewed the linked site and takes no responsibility for the content therein. Such address or hyperlink (including addresses or hyperlinks to New Constructs own website material) is provided solely for your convenience and the information and content of the linked site do not in any way form part of this report. Accessing such websites or following such hyperlink through this report shall be at your own risk.

All material in this report is the property of, and under copyright, of New Constructs. None of the contents, nor any copy of it, may be altered in any way, copied, or distributed or transmitted to any other party without the prior express written consent of New Constructs. All trademarks, service marks and logos used in this report are trademarks or service marks or registered trademarks or service marks of New Constructs. Copyright New Constructs, LLC 2003 through the present date. All rights reserved.