

Machines Learning Finance. Will They Change the Game?

OVERVIEW

This year's conference will explore aspects of machine learning (ML) and artificial intelligence (AI) and their implications for the financial system and public policy. Will ML and AI, as some informed observers predict, have a transformative impact on the financial system, the economy, and even society? And if so, are our regulatory and monetary policy frameworks ready for this brave new world?

PROGRAM

Sunday, May 6, 2018

6:00 p.m. General conference reception

7:00 **Dinner and “A Conversation on Machine Learning in Financial Regulation”**
Randal Quarles, Vice Chairman of Supervision, Board of Governors of the Federal Reserve System

Monday, May 7, 2018

7:30 a.m. Breakfast

8:25 **Welcome**
Raphael Bostic, President and CEO, Federal Reserve Bank of Atlanta

8:30 **Policy Session 1: How Do Machines Learn Finance?**
This session will help frame the discussion of the potential impacts of ML by presenting some background on what it is and is not. For example, is ML a fundamentally new set of tools? Or does it represent an accelerated innovation of tools already long in use? Are we on the verge of seeing strong AI where machines can outperform humans on every task? What are the major strengths, weaknesses, and limitations of ML? How do human experts and decision makers interact with ML? And in a financial setting, like the real-time evaluation of the flow of news, how does ML work?

- Moderator: *Francis X. Diebold*, Paul F. and Warren S. Miller Professor of Economics and Professor of Finance and Statistics, University of Pennsylvania
- *Gideon Mann*, Head of Data Science, Bloomberg
- *Ryan Adams*, Professor of Computer Science, Princeton University
- *John P. Cunningham*, Associate Professor, Department of Statistics, Columbia University

10:30 Break

11:00 **Policy Session 2: Machines Learning Regulation (and Vice Versa)**
Machine learning has the potential to change significantly the regulatory environment—for better and worse. This session will discuss how ML is teaching financial firms to

optimize their risk management and comply with regulation more effectively and at lower cost. The session will also examine ways ML helps supervisors enforce existing regulation more effectively. Looking forward, what concerns should supervisors have about potential risks ML poses to the financial system? Can the current regulatory system manage these risks?

- Moderator: *Stacey Schreft*, Deputy Director for Research and Analysis, Office of Financial Research, U.S. Department of the Treasury
- *Scott Bauguess*, Deputy Director, Division of Economic and Risk Analysis, Securities and Exchange Commission
- *William Lang*, Managing Director, Promontory Financial Group
- *John Schindler*, Associate Director, Program Direction Section, Financial Stability, Board of Governors of the Federal Reserve System

12:30 p.m. Luncheon buffet

2:00 p.m. **Research Session 1: “Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics”**

- Presenter: *Chad Syverson*, Eli B. and Harriet B. Williams Professor of Economics, University of Chicago
- Discussant: *Dave Altig*, Executive Vice President and Research Director, Federal Reserve Bank of Atlanta
- Moderator: *Patrick Harker*, President and CEO, Federal Reserve Bank of Philadelphia

3:00 Break

3:30 **Policy Session 3: Learning about an ML-Driven Economy**

As ML and automation spread beyond manufacturing and financial services, the potential for significant structural change has important implications for macroeconomic policy, including monetary policy. But just how big is the likely impact of ML on the economy? Will changes to business models affect statistical measures of macroeconomic performance? If so, when and how can policy makers determine if ML is influencing unemployment and inflation? If macroeconomic policymakers—especially monetary policymakers—conclude that ML is significantly affecting the overall economy, how should they respond?

- Moderator: *Vincent Reinhart*, Managing Director and Chief Economist, BNY Mellon Asset Management North America
- *Rob Kaplan*, President and CEO, Federal Reserve Bank of Dallas
- *Carolyn Evans*, Head Economist and Senior Data Scientist, Intel Corporation
- *Charles Evans*, President and CEO, Federal Reserve Bank of Chicago

5:00 Session adjourns

6:00 Reception

7:00 **Dinner and keynote: “Design, Data and Development: How AI Ethics is Transforming Engineering, Identity and Economics”**

John Havens, Executive Director, IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems

Tuesday, May 8, 2018

- 7:00 a.m. Breakfast
- 7:50 **Welcome back**
Marie Gooding, First Vice President and COO, Federal Reserve Bank of Atlanta
- 8:00 **Keynote: “Digitization of Money and Finance: Challenges and Opportunities”**
Tao Zhang, Deputy Managing Director, International Monetary Fund
- 9:00 **Research Session 2: “Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies”**
- Presenter: *Matt Scherer*, Associate, Littler Mendelson
 - Discussant: *Greg Scopino*, Special Counsel, Division of Swap Dealer and Intermediary Oversight, U.S. Commodity Futures Trading
 - Moderator: *Larry Wall*, Director for the Center of Financial Innovation and Stability, Federal Reserve Bank of Atlanta
- 10:00 Break
- 10:30 **Policy Session 4: Machines Learning Investments**
Machines have been learning finance for decades, and algorithmic, high-frequency trading has received much attention. However, recent developments in data availability and storage, computer speed, and learning techniques might dramatically change and accelerate technology’s participation in the financial system. This session will explore the strengths and weaknesses of using ML to design and execute portfolio strategies. Will ML ultimately replace human analysts in investment decisions? How likely is ML to provide an enduring source of competitive advantage for some investors? Will machines trading against other machines create new types of systemic risk? In reshaping asset management, where will ML go next?
- Moderator: *Chester Spatt*, Pamela R. and Kenneth B. Dunn Professor of Finance, Tepper School of Business, Carnegie Mellon University
 - *Rishi Narang*, Founding Principal, T2AM
 - *Christina Qi*, Partner, Domeyard
 - *Andrei Kirilenko*, Director of the Centre for Global Finance and Technology, Imperial College Business School
- Noon **Closing remarks**
Paula Tkac, Senior Vice President and Associate Director of Research, Federal Reserve Bank of Atlanta
- 12:05 p.m. Luncheon
- 1:00 Adjournment