
JOIM CONFERENCE SERIES
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CAMBRIDGE, MA
FinTech & Big Data

CONFERENCE SUMMARIES



Sanjiv Das

Santa Clara University

FinTech, AI and Deep Learning in Finance

The recent explosion of deep learning in many fields has also extended to Finance. We will explore why deep learning has been so effective and present examples of the application of deep learning to finance. The relationship with the broader area of FinTech will also be discussed.

Jakub Jurek

Wealthfront

Modern Financial Planning

The availability of linking and data aggregation platforms facilitates the delivery of highly personalized financial planning advice characterized by accuracy, immediacy, and optimality. The data indicate meaningful opportunities for improving client welfare, and reveal important shortcomings of the traditional financial industry.

Seoyoung Kim

Santa Clara University & Dan Trepanier,
Xangrila

Violations of Price-Time Priority and Implications for Market Quality

Using a proprietary dataset of limit orders and order confirmations timestamped to the nanosecond (i.e., one-billionth of a second), we explore the timely and important question regarding the consistency and reliability of an exchange's price/time priority in practice. We find a high degree of variability (i.e., jitter) in the time it takes to receive official exchange acknowledgement once an order is placed, and we provide evidence suggesting impaired market quality in the form of unabsorbed end-of-day order imbalance as a result.

Andrew Lo

Massachusetts Institute of Technology

Algorithmic Models of Investor Behavior

We propose a heuristic approach to modeling investor behavior by simulating combinations of simpler systematic investment strategies associated with well-known behavioral biases with functional forms motivated by an extensive review of the behavioral finance literature review with parameters calibrated from historical data. We compute the investment performance of these heuristics individually and in pairwise combinations using both simulated and historical asset-class returns. The mean-reversion or momentum nature of a heuristic can often explain its effect on performance, depending on whether asset returns are consistent with such dynamics. We propose a Markov chain Monte Carlo (MCMC) algorithm for estimating the parameters of these strategies and their implicit weights, and show that this method can successfully infer the relative importance of each heuristic among a large cross-section of investors, even when the number of observations per investor is quite small. We also compare the accuracy of the MCMC approach to regression analysis in predicting the relative importance of heuristics at the individual and aggregate level, and conclude that MCMC predicts aggregate weights more accurately while regression outperforms in predicting individual weights.

Alfred Spector

TwoSigma

Data Science: Opportunities, Limitations, and Perils

Over the last few decades, empiricism has become the third leg of computer science, adding to the field's traditional bases in mathematical analysis and engineering. Resulting data-driven approaches have led to extremely powerful prediction and optimization techniques and hold great promise in many fields, including the optimization of financial systems. However, no new technology arrives without complications. In this

presentation, I will balance the opportunities provided by big data and associated A.I. approaches with a discussion of the various challenges. I'll enumerate ten plus one categories including those which are technical (e.g., necessity of significant training data, resilience, complexity), societal (e.g., difficulties in setting objective functions or understanding causation), and humanist (e.g., issues relating to free will or privacy). My goal is for the presentation to be valuable to conference attendees as it relates to both their vocational and broader societal interests.

Jessica Stauth

Quantopian

Constructing a Meta-Portfolio: In Search of an Optimal Allocation Strategy Across many Independent Investment Algorithms

In this talk we will consider the problem of allocating capital across many self-contained and independent investment algorithms which have been developed by the Quantopian community with the goal of maximizing ex-post Sharpe ratio. In evaluating procedures for constructing the meta-portfolio we must consider estimation risk, varying capacity constraints across algorithms, skill awareness, as well as the cost of rebalancing weight between algorithms. We find that a walk-forward Bayesian optimization approach outperforms both naive procedures such as equal weight or inverse variance allocation, as well as single-objective optimizations such as minimum variance or maximize Sharpe.

Nancy Wallace

University of California Berkeley

FinTech and Discrimination: A Pitfall of the Algorithmic Credit Scoring of Households?

Credit scoring has long been the first step in the underwriting of household loans. Recently, technology-enabled "FinTech" loan companies have sought to drive significant cost reductions

in the underwriting processes, increase speed of credit decisions, and improve scoring precision with consumer-facing innovations, relying on big data and algorithmic underwriting. The use of big data, however, does not come without risks of discrimination, as more data even naively used could easily result in greater statistical, or intentional, discrimination. To study the effect of these underwriting changes, this paper focuses on the housing market, which represents the largest household loan market as well as the largest market for FinTech loans.

Di (Andrew) Wu

University of Michigan

Robo-Discrimination? Human Bias Against Automated Wealth Advisors, and Mitigation Strategies

Human investors—particularly retail investors with limited financial knowledge—tend to have

an irrational bias against using automated wealth management services such as robo-advisors. In a series of controlled experiments, we demonstrate that human subjects systematically prefer their own investment decisions and those of human experts over decisions generated by robo-advisors, despite the clear stochastic dominance by automated decisions, and despite the fact that human experts parrot exactly the same decisions as robo-advisors. Further manipulating the treatment arms, we pinpoint the reason for such biases to (1) information asymmetry and (2) lack of perceived control, and demonstrate that these biases are not likely to be caused by (1) lack of trust and (2) investor overconfidence.