

SoFiE Summer School, Chicago

Machine Learning and Finance: The New Empirical Asset Pricing PROGRAM

July 23, 2018 (noon) - July 27, 2018 (1:15pm)

University of Chicago Campus, Chicago, IL

Saieh Hall (SHFE 021), 5757 S. University Ave., Chicago, IL 60637

Updated on July 17

Monday, July 23

Monday Morning (optional)

- Registration begins at 9 am and goes all the way through 1:30 pm
- University of Chicago Campus tour (Sign up required. Space is limited)

Tour departs from the Admission Building, in the Main Quadrangle. Please stop by SHFE 021 to register first.

Monday Afternoon

Lectures by [Bryan Kelly](#), Professor of Finance, Yale School of Management, and AQR Capital Management, and [Dacheng Xiu](#), Professor of Econometrics and Statistics, and Charles E. Merrill Faculty Scholar, University of Chicago Booth School of Business

- Overview of Asset Pricing: The canonical empirical problems. The motivating economic questions. A brief history of empirical findings.
- Overview of Machine Learning: What is it? Is it appropriate for asset pricing? How does asset pricing differ from domains in which ML has demonstrated success?

Monday Evening

Downtown Chicago Walking Tours: When Art Slams Into Science (Registration required. Space is limited)

Is architecture a science? Or is it an art? We'll discuss this question as we gaze up at Chicago's best skyscrapers and talk about how architecture walks the perfect line between the left brain and the right brain. We'll also talk about the fire and Mrs. O'Leary's cow, peer at Tiffany glass and see one of Chicago's prettiest historic hotels.

Tuesday, July 24

Tuesday Morning

Lectures - Bryan Kelly and Dacheng Xiu

- Linear models: Motivation and common pitfalls. Subset selection and stepwise regression. Forecast combination. Shrinkage (ridge, lasso, empirical Bayes). Dimension reduction (principal component regression, partial least squares). Comparison of selection and shrinkage methods. Generalized linear models. Numerical optimization. Extensions.

Tuesday Lunchtime

Keynote Speaker - [Li Deng](#), [Citadel](#)

Tuesday Afternoon

Rohit Allena, Emory University

- *Comparing Asset Pricing Models with Traded and Non-Traded Factors*

Chuck Boyer, University of Chicago

- *Public Pensions, Political Economy and State Government Debt Yield Spreads*

Eugenio Carnemolla, Swiss Finance Institute & University of Lausanne

Giuseppe Vinci, Rice University

- *Climate Risks and Stock Returns*

Jinfei Sheng, University of California Irvine

- *Asset Pricing in the Information Age: Employee Expectations and Stock Returns*

Tuesday Evening

Architectural Boat Tour on the Chicago River (Sign up required. Space is limited)

The Chicago Architecture Foundation River Cruise is a must for out-of-towners and Chicagoans alike. You'll find out how Chicago grew from a small settlement into one of the world's largest cities in less than 100 years.

Wednesday, July 25

Wednesday Morning

Keynote Speaker - [Cam Harvey](#), Duke University Fuqua School of Business

Lecture, Bryan Kelly and Dacheng Xiu

- Factor models: Overview. Fama-Macbeth. Latent factors. IPCA. Factor selection, risk premium estimation, and testing. Factor zoo.

Wednesday Lunchtime

Victor Duarte, Federal Reserve Bank of Dallas

- *Sectoral Reallocation and Endogenous Risk-Aversion: Solving Macro-Finance Models with Machine Learning*

Maziar Kazemi, Massachusetts Institute of Technology

- *An Information-Theoretic Approach to Estimating Risk Premia*

Wednesday Afternoon

Lecture, Bryan Kelly and Dacheng Xiu

- Factor models (ctd): Overview. Fama-Macbeth. Latent factors. IPCA. Factor selection, risk premium estimation, and testing. Factor zoo.

Keynote Speaker - [Allan Timmermann](#), University of California Rady School of Management, San Diego

Alberto Martin Utrera, Lancaster University

- *A Portfolio Perspective on the Multitude of Firm Characteristics*

Thursday, July 26

Thursday Morning

Lectures - Bryan Kelly and Dacheng Xiu

- Nonlinear Models: Regression Trees (Basics. CART. Estimation. Boosting. Random forests.) Neural Networks (Origins and basics). Estimation (stochastic gradient descent, backpropagation, regularization)

Thursday Lunch

Lecture - [Asaf Manela](#), Professor of Finance, Washington University Olin Business School, Saint Louis

Thursday Afternoon

Valentina Raponi, Imperial College Business School

- *Testing Beta-Pricing Models Using Large Cross-Sections*

Paula Mirela Sandulescu, USI Logano & Swiss Finance Institute

- *Model-Free International Stochastic Discount Factors*

Paul Sangrey, University of Pennsylvania

- *Jumps, Realized Densities, and News Premia*

Cisil Sarisoy, Northwestern University

- *Linear Factor Models and the Estimation of Expected Returns*

Carter Davis, University of Chicago

- *Predictable Downturns*

Thursday Evening

Reception at the [Stevanovich Center](#), 5727 S. University Ave, Chicago (Optional and open to all - No registration required)

Friday, July 27

Friday Morning

Lecture, Bryan Kelly and Dacheng Xiu

- Inference in machine learning.

Ruoxuan Xiong, Stanford University

- *Interpretable Proximate Factors for Large Dimensions*

Nancy Xu, Columbia University & Boston College

- *The Time Variation in Risk Appetite and Uncertainty*

Friday Lunch

Keynote Speaker - [Nick Polson](#), Professor of Econometrics and Statistics, University of Chicago Booth School of Business

LOGISTICS

Public Transportation to and from our Hyde Park Campus:

From Midway Airport to the University of Chicago campus: bus #55 leaves from Midway airport orange line station (head outside to the bus station).

From Midway Airport to Downtown Chicago: take the CTA train at Midway airport (Orange Line)

From O'Hare Airport to the University of Chicago campus or Downtown: please use the [RTA trip planner](#).

From The University of Chicago Campus to Downtown: take bus #6 or the Metra.

[Airport Express](#) is also a good option.

Housing (MUST READ IF YOU'RE STAYING IN A UC DORM)

Summer School participants will be housed in [Granville-Grossman](#), 6031 South Ellis Ave.

Chicago, IL 60637. Rooms will be assigned by the University of Chicago housing services, one gender/floor. Rooms are individual and showers are common.

- Check in date is Sunday, July 22 as of 2pm (no early check-in allowed but late check-ins will be accommodated. There is staff onsite 24/7)
- Check out date is Friday, July 27 up to 10am (no late check-out allowed).

Please note:

- Linens, a lightweight blanket, a pillow, a bath towel and a hand towel are provided
- There is no storage room for luggages prior to check in
- There will be a storage room available for your luggage on Friday, near our classroom
- Lost ID cards will be charged \$30
- **Bring:** an identification card with you for check-in; earplugs as unfamiliar noises can be disruptive; beach flip flops for the showers and if you'd like to go to the beach; gym clothes if you'd like to use the athletics facilities or run along the lake; soap and shampoo.

Weather

Chicago climate is classified as humid continental: temperatures reach anywhere between 80 and 100F (26 to 38C) in the summer, with sometimes cool nights and occasional heavy rains, strong winds and impressive storms. Wear layers and bring an umbrella or a rain jacket.

Please note

Classes will be held in [Saieh Hall](#), SHFE 021, on the University of Chicago main Campus, in Hyde Park. Please, use the main entry on the pedestrian path.

Rideshare services: the best drop off point is at the corner of 58 & S. Woodlawn Ave.

The best train stop is 55-56-57th (exit on 57th.)

Organizing Committee

- Professor Bryan Kelly, Yale School of Management and AQR Capital Management, **Lecturer** in the Summer School
- Professor Dacheng Xiu, Booth School of Business, University of Chicago, **Lecturer** in the Summer School
- Professor Per Mykland, Director, Stevanovich Center for Financial Mathematics

Sponsors

- Stevanovich Center for Financial Mathematics, University of Chicago
- Society for Financial Econometrics (SoFiE)
- Becker Friedman Institute for Economics, University of Chicago

Local Contact

Sylvie Bendier Decety, sbendier@uchicago.edu, 773.834.8563

Reminder: all selected participants are expected to be members of SoFiE, the [Society for Financial Econometrics](#).