

# 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

### 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*

Alberto Martin Utrera, Lancaster University

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

### 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

## 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