

## Justin Sirignano

### Appointments

Assistant Professor, University of Illinois at Urbana-Champaign  
Department of Industrial and Enterprise Systems Engineering

Aug. 2016-

Chapman Fellow, Imperial College London  
Department of Mathematics

2015-2016

### Education

Princeton University, B.S.E. 2006-2010  
Princeton, New Jersey  
Major: Operations Research and Financial Engineering  
Certificate: Applied and Computational Mathematics  
GPA: 3.9/4.0 and graduated *summa cum laude*  
Elected to Phi Beta Kappa, Tau Beta Pi, and Sigma Xi

Stanford University 2010-2015  
Stanford, California  
PhD in Management Science and Engineering  
Research focuses: Machine learning, optimization, applied probability, finance  
GPA: 4.0/4.0

### Publications

- “Large-scale Optimization of Loan Portfolios”. J. Sirignano, G. Tsoukalas, and K. Giesecke. *Operations Research*, 64:6,1239-1255, 2016.
- “Optimization of Secondary-Air Addition in a Continuous One-Dimensional Spray Combustor.” J. Sirignano, L. Rodriguez, A. Sideris, and W. Sirignano. *Journal of Propulsion and Power*, 26.2: 288-294, 2010.
- “Fluctuation Analysis for the Loss from Default.” K. Spiliopoulos, J. Sirignano, and K. Giesecke. *Stochastic Processes and their Applications*, (124): 2322-2362, 2014.
- “Large Portfolio Asymptotics for Loss from Default.” K. Giesecke, R. Sowers, K. Spiliopoulos, and J. Sirignano. *Mathematical Finance*, 25(1), 77-114, 2015, 2015.
- “A Forward-Backward Algorithm for Stochastic Control Problems.” S. Ludwig, J. Sirignano, R. Huang, and G. Papanicolaou. *Proceedings of the First International Conference on Operations Research and Enterprise Systems*. Vilamoura, Algarve, Portugal. 4 – 6 February, 2012.

### Preprints

- “Risk Analysis for Large Pools of Loans”. J. Sirignano and K. Giesecke. Winner of 2014 SIAM Financial Mathematics and Engineering Conference Paper Prize. Minor revision at *Management Science*. Preprint available online.
- “Stochastic Gradient Descent in Continuous Time”. J. Sirignano and K. Spiliopoulos. Preprint available online.
- “Deep Learning for Limit Order Books”. J. Sirignano. Preprint available online.

- “Deep Learning for Mortgage Risk”. J. Sirignano, A. Sadhwani, and K. Giesecke. Preprint available online.
- Invited article on machine learning for *SIAM News* (to be published in late 2017).

## Honors

- Three computational grants for Blue Waters supercomputer (2016-2017).
- SIAM Financial Mathematics and Engineering Conference Paper Prize.
- Lore von Jaskowsky Memorial Prize, School of Engineering and Applied Sciences at Princeton University, for senior thesis research.
- Rose Hills Foundation Engineering Fellowship, Stanford University.
- Travel Award for SIAM Financial Math Conference (2012, 2014, 2016), SIAM.
- US Patent Application 15331825, Method and Apparatus for Large-Scale Loan Portfolio Optimization. Co-inventor with Kay Giesecke (Stanford).

## Teaching

- Started a graduate course on Deep Learning at University of Illinois at Urbana-Champaign. This is a popular graduate course with students from many science and engineering departments. The course has a 25,000 hour allocation for the students to use GPUs.
- Started a graduate course on Machine Learning at the Department of Math, Imperial College London.
- Introduction to Probability and Statistics course for undergraduates at the University of Illinois at Urbana-Champaign.

## Organized Minisymposiums and Conference Sessions

- *Machine learning models and methods in finance* session at INFORMS Annual Meeting, Houston, October 2017
- *Financial engineering* session at INFORMS Applied Probability Meeting, Northwestern University, July 2017.
- *Machine Learning for Finance* minisymposium at SIAM Financial Mathematics Conference, Austin, November 2017.
- *Machine Learning for Finance* session at INFORMS Annual Meeting, Nashville, November 2016.
- *Large-scale Portfolio Risk* session at INFORMS Annual Meeting, Philadelphia, November 2015.

## Conference and Seminar Presentations

- INFORMS Annual Meeting, Houston, October 2017. Invited Speaker.
- Seminar at IIT Department of Applied Mathematics, September 2017.
- INFORMS Applied Probability Meeting, Evanston, July 2017. Invited Speaker.
- Seminar at Northwestern University, April 2017.
- Seminar at UIUC Machine Learning Seminar Series, March 2017.
- Seminar at UIUC Business School, February 2017.
- SIAM Financial Mathematics Conference, Austin, Texas, November 2016.

- Seminar at London Business School, London, June 2016.
- Seminar at Oxford University, May 2016.
- Statistics Seminar at Imperial College London, London, May 2016.
- INFORMS Annual Meeting, Philadelphia, November 2015. Invited Speaker.
- Finance and Stochastic Seminar at Imperial College London, London, October 2015.
- London-Paris Bachelier Workshop on Mathematical Finance, London, September 2015. Invited Speaker.
- IPAM Workshop on Systemic Risk and Financial Networks, Los Angeles, 2015. Invited Speaker.
- SIAM Financial Mathematics and Engineering Meeting, Chicago, 2014. Invited Speaker.
- INFORMS Annual Meeting, San Francisco, 2014. Invited Speaker.
- Joint Mathematics Meeting, Baltimore, 2014. Invited Speaker.
- INFORMS Annual Meeting, Minneapolis, 2013. Invited Speaker.
- Fifth Western Conference on Mathematical Finance, 2013.
- INFORMS Annual Meeting, Phoenix, October 2012. Invited Speaker.
- Financial Mathematics Seminar, Stanford University, 2012.
- SIAM Financial Mathematics and Engineering Meeting, Minneapolis, 2012.
- Annual Meeting of the Canadian Applied and Industrial Mathematics Society, Toronto, 2012. Invited Speaker.
- 5th Financial Risks International Forum, Paris, 2012.