Justin A. Sirignano

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Appointments

Assistant Professor (tenure-track), University of Illinois at Urbana-Champaign 2016-
Department of Industrial and Enterprise Systems Engineering

Chapman Fellow, Imperial College London 2015-2016
Department of Mathematics

Education

Stanford University 2010-2015
PhD in Management Science and Engineering
Dissertation Advisor: Professor Kay Giesecke
Research focuses: Machine learning, optimization, finance
GPA: 4.0/4.0

Princeton University, B.S.E. 2006-2010
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

Publications

- "Large-scale Optimization of Loan Portfolios" (with K. Giesecke and G. Tsoukalas). Forthcoming, *Operations Research*.
- "Large Portfolio Asymptotics for Loss from Default" (with K. Giesecke, K. Spiliopoulos, and R.B. Sowers). *Mathematical Finance*, 2013.
- "Fluctuation Analysis for the Loss from Default" (with K. Giesecke and K. Spiliopoulos). *Stochastic Processes and their Applications*, (124): 2322-2362, 2014.
- "Optimization of Secondary-Air Addition in a Continuous One-Dimensional Spray Combustor" (with L. Rodriquez, A. Sideris, and W. Sirignano). *Journal of Propulsion and Power*, 26.2: 288-294, 2010.
- "A Forward-Backward Algorithm for Stochastic Control Problems" (with S. Ludwig, R. Huang, and G. Papanicolaou). *Proceedings of the First International Conference on Operations Research and Enterprise Systems.* Vilamoura, Algarve, Portugal. $4 - 6$ February, 2012.

WORKING PAPERS

- "Deep Learning for Limit Order Books". Submitted.
- "Risk Analysis for Large Pools of Loans" (with K. Giesecke). Submitted. Winner of 2014 SIAM Financial Mathematics and Engineering Conference Paper Prize.
- "Likelihood Estimation for Large Financial Systems" (with K. Giesecke and G. Schwenkler).
- "Deep Learning for Mortgage Risk" (with A. Sadhwani and K. Giesecke).

Honors

- NSF Grant ($220,000), Division of Social and Economic Sciences: Methodology, Measurement, and Statistics Program. Co-wrote proposal with PhD advisor.
- 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.

Selected Presentations

- Seminar at London Business School, June 2016.
- Seminar at Bank of England, May 2016.
- INFORMS Annual Meeting, Philadelphia, November 2015. Invited Speaker.
- Capital Fund Management-Imperial Workshop, London, September 2015.
- London-Paris Bachelier Workshop on Mathematical Finance, London, September 2015. Invited Speaker.
- Lending Club, San Francisco, 2015.
- Institute for Pure and Applied Mathematics, UCLA, 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.
- INFORMS Annual Meeting, Phoenix, October, 2012. Invited Speaker.
- SIAM Financial Mathematics and Engineering Meeting, Minneapolis, 2012.
- Annual Meeting of the Canadian Applied and Industrial Mathematics Society, Toronto, 2012. Invited Speaker.

Professional Activities

- Co-organizer of *Machine Learning for Finance* minisymposium at SIAM Financial Math Meeting, 2016.
- Organizer of *Large-scale Portfolio Risk* Session for INFORMS Annual Meeting, 2015.
- Chair of the *Credit Risk* session for SIAM Annual Meeting, Minneapolis, 2012.
- Organizer of *Financial Risks* session for INFORMS Annual Meeting, 2014.

Teaching Experience

- Introduction to Machine Learning (Imperial College Math Dept., Spring 2016): Master/PhD level course on machine learning.
- Neural Networks and Deep Learning (University of Illinois at Urbana-Champaign, Fall 2016): Master/PhD level course on deep learning.

Work Experience

- British Petroleum, Natural Gas and Power (NAGP) Trading, Summer 2013. Machine learning for trading in electric power market.

SKILLS Matlab, Python, Torch, Lua, C++, C, R, HDF5, Amazon Web Services

CITIZENSHIP United States of America