Daniel E. Rigobon

CONTACT INFORMATION

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EDUCATION

Princeton University, Princeton, NJ
PhD. Candidate in Operations Research and Financial Engineering, 2018-2023 (Expected)

- Relevant Coursework: Probability in High Dimensions, Stochastic Calculus, PDE Methods for Financial Mathematics, Statistical Foundations of Data Science, Convex and Conic Optimization.
- Research Interests: Algorithmic Fairness, Socioeconomic Networks, Optimal Network Design & Control.
- Cumulative GPA: 3.97

Massachusetts Institute of Technology, Cambridge, MA
B.S. Mechanical Engineering, June 2018

- Minors in Economics, Statistics
- Thesis: *Models of Entrainment of Human Walking*
- Cumulative GPA: 4.8

TEACHING EXPERIENCE

Princeton University

TA for ORF526 (Probability Theory) — Fall 2019, 2021
- Held weekly office hours, planned review sessions, and completed grading.

TA for ORF387 (Networks) — Spring 2020, 2022
- Responsible for weekly office hours, review sessions, and grading.
- Helped structure course material, designed and gave precepts (Spring 2022)

TA for ORF455 (Energy and Commodity Markets) — Fall 2020
- Held weekly office hours and graded students.
- Planned and executed precepts.

TA for ORF473 (Fintech and Data Driven Innovation) — Spring 2021
- Held weekly office hours, planned (and gave) precepts, and graded students.
- Helped design course material, gave several lectures.

STWG (Senior Thesis Writing Group) — Fall 2019 - Spring 2022
- Assisted undergraduate thesis work with workshops, weekly office hours, and guidance throughout their research process.

Garden State Youth Correctional Facility

Teacher for COMP102 (Computer Literacy) — Fall 2021
- First Computer Literacy course taught by Princeton's Prison Teaching Initiative.
- Worked on building engaging projects for students to follow their own interests.

First Republic Bank (FRB), Research and Lifelong Learning
Teacher of Optimization Workshop Oct. 2022

- Designed a high-level introduction to optimization for team leads at FRB.

Research Experience

Princeton University
Ph.D. Student 2018 - Present
Advised by M. Rácz and R. Sircar

- Studying the optimization of network structures to drive consensus-forming (Rácz and Rigobon, 2022).
- Studying models of systemic risk propagation in financial networks (Rigobon and Sircar, Working Paper).
- Proposing a novel framework of procedural algorithmic fairness in learning models.

Fields Institute: Focus Program on Systemic Recovery
PhD Participant April 2021

- Designed a webscraping pipeline to detect business entry and exits in Canada using Google Places API. (Rigobon et al., 2022; Duprey et al. Working Paper)
- Highlighted the tradeoff between efficiency and resilience of socioeconomic systems through Macroeconomic Agent-Based Models.
- Presented results at Fields' Symposium for Systemic Recovery.

State Street Associates
Portfolio Risk and Research Intern Summer 2020

- Studied the relationship between centrality of global financial institutions and volatility.
- Communicated findings to clients through monthly newsletters and short research summaries.
- Contributed to new group mentorship and sponsorship programs in State Street's Global Markets Division.

MIT Media Lab
Research Assistant in 'Human Dynamics' 2017 - 2018
Advised by A. Almaatouq, A. 'Sandy' Pentland, and A. Noriega-Campero

- Analyzed network game data in Python to study effects of social influence.
- Participated in the 'Fragile Families Challenge' of predicting out-of-sample outcomes from social science data using machine learning and data science methods. (Rigobon et al. 2019; Salganik et al, 2020)
- Trained Convolutional Neural Nets on Satellite Imagery to improve targeting of conditional cash transfer programs in Mexico City.

Newman Biomechanics Laboratory
Undergraduate Research Assistant 2016 - 2018
Advised by N. Hogan, J. Ochoa, J. Lee

- Developed an energy-based controller to replicate experimental entrainment behavior in human walking. (Rigobon, 2018; Rigobon et al, 2017)
- Submitted findings for publication and presentation at ASME DSCC 2017.

Honors and Awards

Participant in Extended Problem Solving Workshop on Systemic Recovery, Fields Institute; 2021

President's Fellowship (for interdisciplinary research), Princeton University; 2018

John C. and Elizabeth J. Chato Award (for excellence in Bioengineering), MIT; 2018

Member of Pi Tau Sigma (mechanical engineering honors society), MIT; 2017-2018

AMP Inc. Award (for excellence in 2.002), MIT; 2016

Working Papers

(Publications with * indicate authorship is sorted by contribution)

D.E. Rigobon; *From Utilitarian to Rawlsian Designs for Algorithmic Fairness*; arXiv:2302.03567; 2023.

*T. Duprey, D. E. Rigobon, A. Kotlicki, P. Schnattinger; *Business Closures and (Re) Openings in Real Time Using Google Places*; Bank of Canada; 2022.

M. Rácz, D. E. Rigobon; *Towards Consensus: Reducing Polarization by Rewiring Social Networks*; arXiv:2206.08996; 2022.

D. E. Rigobon, R. Sircar; *Formation of Optimal Interbank Lending Networks under Liquidity Shocks*; arXiv:2211.12404; 2022.

Peer-Reviewed Publications

*T. Duprey, D. E. Rigobon, A. Kotlicki, P. Schnattinger; *Timely Business Dynamics using Google Places*; AEA Papers & Proceedings; 2023 (Forthcoming).

*D. E. Rigobon, T. Duprey, A. Kotlicki, P. Schnattinger, S. Baharian, T. R. Hurd; *Business Closures and (Re) Openings in Real-Time Using Google Places: Proof of Concept*; Journal of Risk and Financial Management; 2022.

B. Jiang, D. E. Rigobon, R. Rigobon; *From "Just in Time" to "Just in Case": Simple Models of Global Supply Chains and Aggregate Shocks*; IMF Economic Review; 2021.

*M. Salganik et al.; *Measuring the Predictability of Life Outcomes with a Scientific Mass Collaboration*; Proceedings of the National Academy of Sciences; 2020.

*D. E. Rigobon, E. Jahani, Y. Suhara, K. AlGhoneim, A. Alghunaim, A. Pentland, A. Almaatouq; *Winning Models for GPA, Grit, and Layoff in the Fragile Families Challenge*; Socius: Sociological Research for a Dynamic World; 2019.

D. E. Rigobon; *Models of Entrainment of Human Walking*; MIT Thesis; 2018.

*D. E. Rigobon, J. Lee, N. Hogan; *Effect of Stochastic Parameter Variation on Entrainment Behavior of a Stable Ankle-Actuated Walking Model*; MIT Undergraduate Research Journal; 2017.

*D. E. Rigobon, J. Ochoa, N. Hogan; *Entrainment of Ankle-Actuated Walking Model to Periodic Perturbations via Leading Leg Angle Control*; ASME Dynamics Systems and Controls Conference; 2017.

Presentations

Timely Business Dynamics using Google Places, Presented by coauthor at AEA Annual Meeting. (January 2023)

Towards Consensus: Reducing Polarization by Rewiring Social Networks, Princeton Institute for Computational Science and Engineering (PICSciE) Graduate Colloquium. (April 2022)

Entrainment of Ankle-Actuated Mechanical Walker, ASME Dynamic Systems and Controls Conference. (October 2017)

Programming Languages

Fluent in: Python, R, LaTeX, MATLAB, HTML, CSS
Familiar with: Java, JavaScript, C++

References

(* indicates references who can supply a letter upon request.)

***Prof. Miklós Racz**, Assistant Professor, ORFE, Princeton University
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***Prof. Ronnie Sircar**, Eugene Higgins Professor, ORFE, Princeton University
sircar@princeton.edu

***Dr. Margaret Holen**, Lecturer, ORFE, Princeton University
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Prof. Mykhaylo Shkolnikov, Associate Professor, ORFE, Princeton University
mykhaylo@princeton.edu

Prof. Alex Pentland, Toshiba Professor of Media Arts and Sciences, MIT
sandy@media.mit.edu

Prof. Abdullah Almaatouq, Douglas Drane Career Development Professor in Information Technology, MIT Sloan
amaatouq@media.mit.edu

Languages and Hobbies

Fluent in Spanish and English; Proficient in French.
Enjoy Ceramics, Music, Cooking, and Philosophy.