(Leo) Hamed Amini

Contact Information

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Academic Appointments

University of Florida, Gainesville, FL — 2022 –

Associate Professor at the Department of Industrial and Systems Engineering
Affiliate Associate Professor, Finance, Insurance and Real Estate Department
Associate Director, Center for Applied Optimization

Georgia State University, Atlanta, GA — 2018 -2022

Associate Professor at the Department of Risk Management and Insurance

University of Miami, Coral Gables, FL — 2015 - 2018

Assistant Professor at the Mathematics Department

Swiss Finance Institute - EPFL, Lausanne, Switzerland — 2011 - 2015

Postdoc at the Swissquote Chair in Quantitative Finance

Education

Ph.D. in Applied Mathematics, École Normale Supérieure - INRIA, Paris — 2007 - 2011

Advisors: Marc Lelarge and François Baccelli

M.S. in Probability and Finance, Paris VI University — 2006 - 2007

(joint École Polytechnique, École Normale Supérieure, ENSAE)

École Polytechnique, Palaiseau, France — 2003 - 2006

B.S. (Diplôme d'Ingénieur) in Applied Mathematics and Computer Science

Visiting Appointments

INRIA Paris, MATHRISK Team *(Invited professor)* — June-July 2021, 2022, 2024

IMSI, University of Chicago, USA *(Invited member)* — March-May 2022

`Semester on "Decision Making and Uncertainty"`

IPAM, UCLA, California, USA *(Invited member)* — March-April 2015

`Semester on "Broad Perspectives and New Directions in Financial Mathematics"`

Isaac Newton Institute, Cambridge, UK *(Invited member)* — August-December 2014

`Semester on "Systemic Risk: Mathematical Modeling and Interdisciplinary Approaches"`

MSRI, Berkeley, California, USA *(Research member)* — January-May 2012

`Semester on "Random Spatial Processes"`

Cornell University, Ithaca, NY *(Visiting scholar)*	December 2011, 2013
Microsoft Research, Redmond, WA, USA *(Visiting scholar)*	April-May 2011
Max-Planck Institut, Saarbrücken, Germany *(Visiting scholar)*	January-March 2011
Imperial College, London, UK *(Visiting scholar)*	April-July 2008
Finance Concepts, Paris, France *(Consulting)*	2007-2008
HSBC, Paris, France *(Quant)*	April-September 2007

Research Interests

Quantitative Risk Management and Financial Regulation
Systemic Risk and Network Models in Finance
Random Structures and Complex Networks
Network Economics and Game Theory
FinTech and Machine Learning

Teaching

Decision Making Under Uncertainty, UF	Spring 2025
Engineering Economy, UF	Fall 2022-2024
Introduction to Financial Technology, UF	Spring 2024
Advanced Engineering Economy, UF	Fall 2023
Risk Assessment Methods, GSU	Spring 2021-2022
Machine Learning in Actuarial Science and Risk Management, GSU	Fall 2020-2022
Financial Engineering, GSU	Spring 2019–2022
Financial Risk and Regulation, GSU	Spring 2019-2020
Risk Modeling, GSU	Fall 2019
Advanced Financial Risk Management, GSU	Fall 2018
Machine Learning in Quantitative Finance, UM	Spring 2018
Stochastic Calculus with Application to Finance, UM	Spring 2018
Introduction to Mathematical Finance, UM	Fall 2017
Quantitative Risk Management, UM	Fall 2017
Introduction to Probability and Statistics, UM	Summer A 2017
Discrete Mathematics, UM	Spring 2017
Introduction to Mathematical Statistics, UM	Spring 2016, 2017
Introduction to Probability Theory, UM	Fall 2015, 2016
Epidemic Modeling & Complex Networks, École Polytechnique	Spring 2013
Exercises in Probability & Statistics and Risk Management, EPFL	2012 - 2014

Publications

Submitted working papers

1. Dynamics of Cascading Losses in Locally Tree-Like Networks
   (with Erfan Salavati)
2. Clustering in Cardinality-Constrained Portfolio Optimization
   (with Amirmohammad Ebrahimi and Hongcheng Liu)

3. Central Limit Theorems for Price-Mediated Contagion in Stochastic Financial Networks
(with Zhongyuan Cao and Agnès Sulem)
4. Ruin-Dependent Bivariate Stochastic Fluid Processes
(with Andreea Minca and Oscar Peralta)
5. Stochastic Graphon Games with Jumps and Approximate Nash Equilibria
(with Zhongyuan Cao and Agnès Sulem)
6. Ruin Probabilities for Risk Processes in Stochastic Networks
(with Zhongyuan Cao, Andreea Minca and Agnès Sulem)
7. Fire Sales, Default Cascades and Complex Financial Networks
(with Zhongyuan Cao and Agnès Sulem)
Invited revision: Mathematics and Financial Economics.
8. Graphon Mean-Field Backward Stochastic Differential Equations with Jumps and Associated Dynamic Risk Measures (with Zhongyuan Cao and Agnès Sulem)
Invited revision: Finance and Stochastics.
9. Duration-Dependent Stochastic Fluid Processes and Solar Energy Revenue Modeling
(with Andreea Minca and Oscar Peralta)
Invited revision: Operations Research.
10. Decentralized Prediction Markets and Sports Books
(with Maxim Bichuch and Zachary Feinstein)
Invited revision: Mathematical Finance.

Refereed journal papers

11. Limit Theorems for Default Contagion and Systemic Risk
(with Zhongyuan Cao and Agnès Sulem)
Mathematics of Operations Research, forthcoming.
12. Blockchain Adoption and Optimal Reinsurance Design
(with Romain Deguest, Engin Iyidogan and Andreea Minca)
European Journal of Operational Research, 318 (1), 341-353, 2024.
13. Clustering Heterogeneous Financial Networks
(with Yudong Chen, Andreea Minca and Xin Qian)
Mathematical Finance, 34 (2), 425-466, 2024.
14. Social Distancing Game and Insurance Investment in a Pandemic
(with Andreea Minca)
Annals of Operations Research, 336, 2009-2036, 2024.
15. Bootstrap Percolation in Inhomogeneous Random Graphs
(with Nikolaos Fountoulakis and Konstantinos Panagiotou)
Advances in Applied Probability, 56(1): 156-204, 2024.
16. Contagion Risks and Security Investment in Complex Networks
Mathematics and Financial Economics, 17, 247-283, 2023.
17. Decentralized Payment Clearing using Blockchain and Optimal Bidding
(with Maxim Bichuch and Zachary Feinstein)
European Journal of Operational Research, 309 (1), 409-420, 2023.
18. A Central Limit Theorem for Diffusion in Sparse Random Graphs
(with Erhan Bayraktar and Suman Chakraborty)
Journal of Statistical Physics, 190 (3), 57, 2023.
19. Optimal Network Compression
(with Zachary Feinstein)
European Journal of Operational Research, 306 (3), 1439-1455, 2023.

20. Epidemic Spreading and Equilibrium Social Distancing in Heterogeneous Networks
(with Andreea Minca)
Dynamic Games and Applications, 12 (1), 258-287, 2022.

21. A Dynamic Contagion Risk Model with Recovery Features
(with Andreea Minca and Agnès Sulem)
Mathematics of Operations Research, 47 (2), 1412-1442, 2022.

22. Systemic Risk in Networks with a Central Node
(with Damir Filipović and Andreea Minca)
SIAM Journal on Financial Mathematics, 11(1): 60–98, 2020.

23. Optimal Equity Infusions in Financial Networks
(with Andreea Minca and Agnès Sulem)
Journal of Financial Stability, 31: 1–17, 2017.

24. Resilience to Contagion in Financial Networks
(with Rama Cont and Andreea Minca)
Mathematical Finance, 26 (2): 329–365, 2016.

25. Uniqueness of Equilibrium in a Payment System with Liquidation Costs
(with Damir Filipović and Andreea Minca)
Operations Research Letters, 44(1):1–5, 2016.

26. To Fully Net or Not to Net: Adverse Effects of Partial Multilateral Netting
(with Damir Filipović and Andreea Minca)
Operations Research, 64(5): 1135–1142, 2016.

27. Inhomogeneous Financial Networks and Contagious Links
(with Andreea Minca)
Operations Research, 64(5): 1109–1120, 2016.

28. Control of Interbank Contagion under Partial Information
(with Andreea Minca and Agnès Sulem)
SIAM Journal on Financial Mathematics, 6(1): 1195–1219, 2015.

29. The Diameter of Weighted Random Graphs
(with Marc Lelarge)
Annals of Applied Probability, 25(3): 1686–1727, 2015.

30. Flooding in Weighted Sparse Random Graphs
(with Moez Draief and Marc Lelarge)
SIAM Journal on Discrete Mathematics, 27(1): 1–26, 2013.

31. Bootstrap Percolation in Power-Law Random Graphs
(with Nikolaos Fountoulakis)
Journal of Statistical Physics, 155 (1): 72–92, 2014.

32. Shortest-Weight Paths in Random Regular Graphs
(with Yuval Peres)
SIAM Journal on Discrete Mathematics, 28 (2): 656–672, 2014.

33. Stress Testing the Resilience of Financial Networks
(with Rama Cont and Andreea Minca)
International Journal of Theoretical and Applied Finance, 15 (1), 2012.

34. Upper Deviations for Split Times of Branching Processes
(with Marc Lelarge)
Journal of Applied Probability, 49(4): 1134–1143, 2012.

35. Bootstrap Percolation in Living Neural Networks
Journal of Statistical Physics, 141: 459–475, 2010.

36. Bootstrap Percolation and Diffusion in Random Graphs with Given Vertex Degrees
Electronic Journal of Combinatorics, 17: #R25, 2010.

Conference proceedings

[C1] S. Chalal, N. H. Amini, G. Guo, H. Amini (2024). Observed Quantum Particles System with Graphon Interaction. *Proc. IEEE Conference on Decision and Control (CDC 2024).*

[C2] Z. Cao, Z. Chen, P. Mishra, H. Amini, Z. Feinstein (2023). Modeling Inverse Demand Function with Explainable Dual Neural Networks. *Proc. ACM International Conference on AI in Finance (ICAIF'23).*

[C3] H. Amini, Z. Cao, A. Sulem (2023). The Default Cascade Process in Stochastic Financial Networks. *Proc. ACM International Conference on AI in Finance (ICAIF'23).*

[C4] H. Amini, Y. Peres (2013). Shortest-weight Paths in Random Graphs. *Proc. 29th European Meeting of Statisticians (EMS'13).*

[C5] H. Amini, N. Fountoulakis, K. Panagiotou (2013). Discontinuous Bootstrap Percolation in Power-Law Random Graphs. *Proc. European Conference on Combinatorics, Graph Theory and Applications (EuroComb'13)*, CRM Series 16, 431–436.

[C6] H. Amini, N. Fountoulakis (2012). What I tell you three times is true: Bootstrap Percolation in Small Worlds. *Proc. Workshop on Internet and Network Economics (WINE'12)*, LNCS 7695, 463–475.

[C7] H. Amini, M. Draief, M. Lelarge (2011). Flooding in Weighted Random Graphs. *Proc. SIAM Workshop on Analytic Algorithmics and Combinatorics (ANALCO'11)*, 1–15.

[C8] H. Amini, M. Draief, M. Lelarge (2009). Marketing in a Random Network. *Proc. Workshop on Network Control and Optimization (NET-COOP'08)*, LNCS 5425, 17–25.

Invited papers and peer-reviewed book chapters

[B1] Clearing Financial Networks: Impact on Equilibrium Asset Prices and Seniority of Claims
(with Andreea Minca)
In: INFORMS TutORials in Operations Research, Pushing the Boundaries: Frontiers in Impactful OR/OM Research, 154-175, 2020.

[B2] Mathematical Modeling of Systemic Risk
(with Andreea Minca)
In: Kranakis, E., Editor, Advances in Network Analysis and its Applications, Mathematics in Industry, Springer Berlin Heidelberg, Vol. 18, 3–26, 2013.

[B3] Stress Testing the Resilience of Financial Networks
(with Rama Cont and Andreea Minca)
In: Finance at Fields, Editor(s): Grasselli, Hughston, World Scientific Publishing Company, Ch. 2, 17–36, 2012.

Fellowship and Funding Awards

- AI Compliance Officer, Co-PI, with Z. Feinstein (PI) and I. Florescu, NSF CRAFT (Center for Research toward Advancing Financial Technologies), 2024 - 2025.
- Multi-Agent Reinforcement Learning in Large Financial Networks with Heterogeneous Interactions, with A. Sulem, Research Award by Institut Europlace de Finance, 2023 - 2024.
- Technologies to Support Global Supply Chains Insurance and Reinsurance, Co-PI, with A. Minca (PI), AXA Research Fund Award, 2020 - 2022.
- Dynamics and Stability of Complex Financial Networks, J. Mack Robinson College of Business, Summer Research Grant, 2022
- AMX doctoral fellowship, French Ministry of Research, France, 2007-2011
- EGIDE fellowship for post-graduate studies, France, 2006-2007
- Fellowship from the École Polytechnique Foundation, 2003-2006

Conferences & Invited Talks

- AMS Spring Southeastern Sectional Meeting, Tallahassee, March 2024
- Finance, Insurance and Real Estate Department, University of Florida, September 2023
- SIAM Conference on Financial Mathematics and Engineering, Philadelphia, June 2023
- AMS Spring Southeastern Sectional Meeting, Atlanta, GA, March 2023
- XXI Latin Ibero-American Conference on Operations Research (CLAIO 2022), Buenos Aires, Argentina, December 2022
- Mathematics Colloquium, Florida State University, October 2022
- Workshop on Systemic Risk and Stress Testing, IMSI Chicago, April 2022
- Department of Industrial and Systems Engineering, University of Florida, February 2022
- INFORMS Annual Meeting, Anaheim, October 2021
- SIAM Conference on Financial Mathematics and Engineering, June 2021
- 8th International Conference on Complex Networks and Applications, Lisbon, December 2019
- INFORMS Annual Meeting, Seattle, October 2019
- Conference on Advanced Mathematical Methods in Finance, Paris, June 2019
- SIAM Conference on Financial Mathematics and Engineering, Toronto, June 2019
- Financial/Actuarial Mathematics Seminar, University of Michigan, Ann Arbor, March 2019
- Combinatorics Seminar, Georgia Tech, Atlanta, February 2019
- Discrete Math Seminar, Georgia State University, Atlanta, October 2018
- AMS Spring Southeastern Sectional Meeting, Nashville, April 2018
- Department of Risk Management & Insurance, Georgia State University, February 2018
- Department of Decision Sciences, HEC Montréal, December 2017
- Workshop on Measurement and Control of Systemic Risk, CRM, Montréal, September 2017
- Stochastic Analysis and Stochastic Finance Seminar, TU Berlin, Germany, July 2017
- SIAM Southeastern Atlantic Section Conference, Florida State University, March 2017
- Winter School on Systemic Risk, Lausanne, January 2017
- Reunion Conference for IPAM's Financial Mathematics, Lake Arrowhead, December 2016
- SIAM Conference on Financial Mathematics and Engineering, Austin, November 2016
- International Conference on Monte Carlo Techniques, Paris, July 2016
- 1st Eastern Conference on Mathematical Finance, WPI, Worcester, March 2016
- XII Simposio de Probabilidad y Procesos Estocásticos, Mérida, November 2015
- Workshop on Random Walks on Random Graphs and Applications, Eindhoven, April 2015
- Workshop on Systemic Risk and Financial Networks, IPAM, UCLA, March 2015
- ORIE Colloquium at Cornell University, March 2015
- Mathematics Colloquia at University of Miami, February 2015
- ORFE Colloquia at Princeton University, February 2015
- Institute for Statistics and Mathematics at WU Vienna, January 2015
- SIAM Conference on Financial Mathematics and Engineering, Chicago, November 2014
- INFORMS Annual Meeting, San Francisco, November 2014
- Workshop on Systemic Risk: Models and Mechanisms, Cambridge, UK, August 2014
- Workshop on Random Graphs, Nice, France, May 2014

- Bachelier Colloquium on Mathematical Finance, Métabief, France, January 2014
- Applied Mathematics Seminar, Cornell University, Ithaca, December 2013
- 29th European Meeting of Statisticians, Budapest, July 2013
- 17th INFORMS Applied Probability Conference, Costa Rica, July 2013
- Conference on Indices of Riskiness and Risk Measures, Zurich, March 2013
- Mathematical Finance Seminar, Université Paris 6, February 2013
- Probability Seminar, École Normale Supérieure de Lyon, January 2013
- Research in Options, Buzios, Rio de Janeiro, December 2012
- Probability Seminar, EPFL, Lausanne, October 2012
- Latsis Symposium on Economics on the Move, ETH Zurich, September 2012
- SIAM Conference on Financial Mathematics and Engineering, Minneapolis, July 2012
- Mathematical Finance Seminar, École Polytechnique, February 2012
- Probability Seminar, Cornell University, Ithaca, December 2011
- Workshop on Econophysics of Systemic Risks and Network Dynamics, Kolkata, October 2011
- 16th INFORMS Applied Probability Conference, Stockholm, Sweden, July 2011
- 7th International Congress on Industrial and Applied Mathematics, Vancouver, July 2011
- Probability Seminar, University of Washington, Seattle, May 2011
- Probability Seminar, Stanford University, May 2011
- SIAM Workshop on Analytic Algorithmics and Combinatorics, San Francisco, January 2011
- Max-Planck-Institut für Informatik, Saarbrücken, Germany, September 2010
- Bachelier Finance Society 6th World Congress, Toronto, June 2010

Advised PhD Students

- Golbarg Nazari (at University of Florida), 2023–
- Amir Ebrahimi (at University of Florida), 2023–
- Kaijiang Wu (co-advised with Jorge Sefair at University of Florida), 2023–
- Élise Devey (co-advised with Agnès Sulem at INRIA Paris), 2023–
- Carlos Nunez (co-advised with Ajay Subramanian at Georgia State University), 2020-2022: General Equilibrium Models in Production Networks
- Prerna Mishra (co-advised with Alireza Aghasi at Georgia State University), 2020-2022: Financial Networks and Contagion: A Deep Learning Framework
- Zhongyuan Cao (co-advised with Agnès Sulem at INRIA Paris), 2020-2023: Systemic Risk, Complex Financial Networks and Graphon Mean Field Interacting Systems

Advised MS Project Students

- Michael Smith (2023)
- Jordan Restrepo (2023)
- Aaron Marquez (2023)
- William Jennings (2023)
- Hector Alvarado Barreto (2021)
- Zhongyuan Cao (2020)
- Damien Ackerer (2012)

Professional Service

Editorials Boards

- Associate Editor, **Mathematical Finance**, 2020 –

Refereeing

- Annals of Applied Probability; Annals of Operations Research; Bernoulli; Combinatorics, Probability and Computing; Econometrica; Electronic Journal of Combinatorics; European Journal of Operational Research; Finance and Stochastics; Geneva Risk and Insurance Review; IEEE Transactions on Network Science; Journal of Applied Probability; Journal of Economic Dynamics and Control; Journal of Financial Stability; Journal of Statistical Physics; Management Science; Mathematical Finance; Mathematics of Operations Research; Operations Research; Quantitative Finance; Random Structures and Algorithms; SIAM Journal on Control and Optimization; SIAM Journal on Discrete Mathematics; Statistics and Risk Modeling; IEEE Transactions on Automatic Control; Physica A: Statistical Mechanics and its Applications; Journal of Systems Science & Complexity; Electronic Journal of Probability; IEEE Conference on Decision and Control; ACM International Conference on AI in Finance.

(Co-) Organizer

- Session on "Blockchain in Finance and Insurance", INFORMS Annual Meeting 2022
- Session on "Systemic Risk and Network Models in Finance", INFORMS Annual Meeting 2021
- Session on "Stochastic Modeling and Financial Impacts of the Coronavirus Pandemic", SIAM Conference on Financial Mathematics and Engineering 2021
- Session on "Risk Management in Blockchain Systems", SIAM Conference on Financial Mathematics and Engineering 2021
- RMI Weekly Research Seminar Series, 2019-2021
- RMI Faculty Research Workshop 2019-2020
- Session on "Financial Risk and Regulation", INFORMS Annual Meeting 2019
- Mini-symposium on "Network Models for Systemic Risk", SIAM Conference on Financial Mathematics and Engineering 2016
- Mini-symposium on "Funding and Market Liquidity in Financial Systems", SIAM Conference on Financial Mathematics and Engineering 2016

Committee Member

- ISE PhD Admissions Committee, University of Florida, 2022–
- ISE Faculty Search Committee, University of Florida, 2023–
- Faculty Affairs Committee for Robinson College of Business, 2019 - 2021
- RMI Faculty Search Committee, Georgia State University, 2018-2020
- RMI PhD Admissions Committee, Georgia State University, 2018-2020
- M.S. Mathematical Finance Admissions Committee, University of Miami, 2015 - 2018

Member of Dissertation Committee

- Yuliang ZHANG (2024): "Financial Contagion and Instability", London School of Economics
- Shokoufeh Pourshahabi (2024): "Quantifying Economic Vulnerabilities Induced by Interdependent Networks", University of Florida
- Qianlong Liu (2021): "Interest Rate Risk Hedging", Georgia State University
- Daniel Quiggin (2019): "Measuring Risk in Networks", Georgia State University