

XINZHE FU

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Massachusetts Institute of Technology
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EDUCATION

Massachusetts Institute of Technology *Sept. 2017 - Current*
Ph.D. Candidate

Laboratory for Information and Decision Systems
Interdisciplinary Doctoral Program in Statistics

- Research Interests: optimization and scheduling in stochastic queueing networks.
- Overall GPA: 5.0/5.0

Shanghai Jiao Tong University (SJTU) *Sept. 2013 - Jun. 2017*
B.S. in Computer Science (with honor)

- Overall GPA: 3.80/4.0 (91.1/100), Major GPA: 3.97/4.0 (95.0/100)
- Research Interests: combinatorial optimization problems in communication networks.

WORK EXPERIENCE

Hedge Fund Analyst Intern – Weiss Asset Management *Jun. 2020 - Aug. 2020*

- Developed statistical trading strategies for equity offerings.
- Designed bidding algorithms for auctions in commodity markets.

Incoming Quantitative Researcher Intern – Five Rings Capital *Jun. 2021 - Aug. 2021*

- Research and analysis of market opportunities, development of trading strategies.

RESEARCH EXPERIENCE

Zeroth-order Optimization in Stochastic Networks *Jun. 2019 - Now*
Laboratory for Information and Decision Systems *Advisor: Prof. Eytan Modiano*

- Investigated utility maximization problems in stochastic networks with zeroth-order feedback.
- Designed optimization algorithms with optimal regret through new techniques that extend traditional zeroth-order convex optimization methods to problems with stochastic constraints.
- Designed optimization algorithms that are efficiently implementable in network settings and handle feedback with queueing delay.

Generalized Routing in Stochastic Networks *Jun. 2019 - Now*
Laboratory for Information and Decision Systems *Advisor: Prof. Eytan Modiano*

- Developed throughput-optimal routing algorithms for stochastic networks with generalized network flows under FIFO queueing discipline.
- Implemented and evaluate the performance of the algorithm on Mininet SDN platform.

Theoretical Analysis of DoS Attacks *Sept. 2017 - Jun. 2019*
Laboratory for Information and Decision Systems *Advisor: Prof. Eytan Modiano*

- Proposed a new paradigm of network interdiction that models DoS attacks where the interdiction is performed by injecting adversarial traffic flow and designed approximation algorithms that compute near-optimal interdiction strategies.
- Proposed a first modeling of DoS attacks in stochastic queueing networks, characterized the theoretical limits of the attacks, and developed optimal attack strategy via Markov-chain theory.

SELECTED PUBLICATIONS

- **Xinzhe Fu** and Eytan Modiano, “Learning-NUM: Network Utility Maximization with Unknown Utility Functions and Queueing Delay”, in *Proc. of ACM Mobihoc*, 2021.
- **Xinzhe Fu** and Eytan Modiano, “Fundamental Limits of Volume-based Network DoS Attacks”, in *Proc. of ACM Measurement and Analysis of Computing Systems (POMACS)*, 2019 and *ACM SIGMETRICS*, 2020.
- Shengzhong Liu, Shuochao Yao, **Xinzhe Fu**, Rohan Tabish, Simon Yu, Ayoosh Bansal, Heechul Yun, Lui Sha and Tarek Abdelzaher, “On Removing Algorithmic Priority Inversion from Mission-critical Machine Inference Pipelines,” In *Proc. IEEE Real-time Systems Symposium (RTSS)*, 2020 (Best Paper Award).
- **Xinzhe Fu** and Eytan Modiano, “Network Interdiction Using Adversarial Traffic Flows”, in *Proc. of IEEE INFOCOM*, 2019.
- **Xinzhe Fu**, Zhongzhao Hu, Zhiying Xu, Luoyi Fu and Xinbing Wang, “Optimal De-anonymization of Social Networks: Quantification and Algorithmic Solution”, in *Proc. IEEE GLOBECOM*, 2017.
- **Xinzhe Fu**, Zhiying Xu, Qianyang Peng, Jie You, Luoyi Fu, Xinbing Wang and Songwu Lu, “ConMap: A Novel Framework for Optimizing Multicast Energy in Delay-constrained Mobile Wireless Networks”, in *Proc. ACM MobiHoc*, 2017.
- **Xinzhe Fu**, Zhiying Xu, Qianyang Peng, Luoyi Fu and Xinbing Wang, “Complexity vs. Optimality: Unraveling Source-Destination Connection in Uncertain Graphs”, in *Proc. IEEE INFOCOM* 2017.
- Hongyu Gong, Luoyi Fu, **Xinzhe Fu**, Lutian Zhao, Kainan Wang and Xinbing Wang, “Distributed Multicast Tree Construction in Wireless Sensor Networks”, in *IEEE Trans. on Information Theory*, 2016.

COURSES AT MIT

- **Mathematics:** 18.1021 Introduction to Functional Analysis, 18.9011 Introduction to Topology, 18.615 Introduction to Stochastic Processes, 18.335 Numerical Methods.
- **Probability and Statistics:** 6.436 Fundamentals of Probability, 6.437 Inference and Information, 6.438 Algorithms for Inference, 9.S914 High Dimensional Statistics, 18.675 Theory of Probability.
- **Algorithm and Optimization:** 6.251 Introduction to Mathematical Programming, 6.252 Non-linear Optimization.
- **System and Application:** 6.867 Machine Learning, 16.393 Statistical Communication and Localization, 6.246 Reinforcement Learning: Foundations and Methods.

HONORS AND AWARDS

- Ho-Ching and Han-Ching Fund Award, MIT 2019
- Outstanding Thesis Award, Shanghai Jiao Tong University (Top 1%) 2017
- Best-in-Session Presentation Award, IEEE INFOCOM 2017
- Meritorious Winner of Interdisciplinary Contest in Modeling 2016

SKILLS

Programming C++, Python.
Tools Network Simulator, MATLAB, Xilinx ISE.