

**Xinyu Wu** Tel: (+1)857-209-1712 Email: [wuxinyusjtu@gmail.com](mailto:wuxinyusjtu@gmail.com) Language: Matlab (major); Python, C++ (minor)

Personal Site: <https://xinyuwusjtu.github.io/wxy/> (more details)

Github Site: <https://github.com/xinyuwusjtu>

## EDUCATION

### Massachusetts Institute of Technology (MIT), Laboratory of Information and Decision Systems (LIDS)

- Ph.D. in Aeronautics and Astronautics & Interdisciplinary Doctoral Program in Statistics (IDPS) Sept. 2020 - Present
- M.S. in Aeronautics and Astronautics Sept. 2018 - Aug. 2020
- **Advisor:** Eytan Modiano **GPA:** 5.0/5.0 **Research Interests:** Network Robustness, Control, and Optimization
- **M.S. Thesis:** An Influence Model Approach to Failure Cascade Prediction

### Shanghai Jiao Tong University (SJTU), Electronic Engineering (GPA: 93.0/100, Rank 1/168) Sept. 2014 - Jun. 2018

- **Selected Courses:** C++ (A+); Data Structure (A+); Algorithm & Complexity (A); ARM Embedded System (A)
- **Thesis:** Theoretical Analysis and Algorithm Design for Social Network De-Anonymization (**Outstanding Thesis, top 1%**)

### Shanghai Jiao Tong University (SJTU), Mathematics (minor) (GPA: 95.4/100, Rank 1/26) Feb. 2016 - Jun. 2018

- **Selected Courses:** Advanced Algebra (A+); Real Analysis (A+); Stochastic Process (A); Numerical Analysis (A)
- **Thesis:** Study of Planar Interpolation Polynomial (A)

## SELECTED PUBLICATIONS

- **Xinyu Wu**, Dan Wu, Eytan Modiano, “An Influence Model Approach to Failure Cascade Prediction in Large Scale Power Systems”, *the 2020 American Control Conference (ACC)*, Denver, USA, Jul. 1<sup>st</sup>-3<sup>rd</sup>, 2020. (extended version under review of *IEEE Transactions on Power Systems*)
- **Xinyu Wu**, Xiaohua Tian, Xinbing Wang, “Large-scale Wireless Fingerprints Prediction for Cellular Network Positioning”, *IEEE International Conference on Computer Communications (INFOCOM)*, Honolulu, USA, Apr. 15<sup>th</sup>-19<sup>th</sup>, 2018. (extended version in *IEEE Transactions on Mobile Computing*, vol. 19, no. 2, pp. 450-465, 2019)
- **Xinyu Wu**, Zhongzhao Hu, Xinzhe Fu, Luoyi Fu, Xinbing Wang, Songwu Lu, “Social Network De-Anonymization with Overlapping Communities: Analysis, Algorithm, and Experiments”, *IEEE International Conference on Computer Communications (INFOCOM)*, Honolulu, USA, Apr. 15<sup>th</sup>-19<sup>th</sup>, 2018.

## RESEARCH EXPERIENCES

### Finite-Buffer Communication System Analysis | MIT | Advisor: Eytan Modiano Sept. 2019 - Present

- Proved sufficient conditions for stability in queue-based finite-buffer systems with both single and multiple commodities.
- Formulated an optimization framework to capture the throughput reduction due to the finite buffer saturation.
- Designed a shortest-path based capacity allocation scheme to achieve most balanced overloading in finite-buffer systems.

### Failure Cascade Prediction and Analysis in Network Systems | MIT | Advisor: Eytan Modiano Nov. 2018 - Sept. 2019

- Proposed a way to estimate the influence among network components by Monte-Carlo approach and quadratic programming.
- Showed the method predicting the failure cascade size within 7% error rate and the final state within 10% error rate for DC/AC power systems with at most ~3000 nodes, using only <3.4% of all the cascade samples of ‘N-2’ initial contingencies.
- Proposed a parallelable way to identify critical components that costs  $O(n^2)$  time, where prior works cost at least  $O(n^{2.373})$ .

### Social Network De-Anonymization | SJTU | Advisor: Luoyi Fu & Xinbing Wang Mar. 2017 - May. 2018

- Developed an optimization framework for de-anonymization based on the mean square error with approximation ratio = 2.
- Put forward a heuristic algorithm based on the convex-concave optimization to solve the de-anonymization problem.
- Identified at most ~90% anonymized users on the Microsoft Academic Graphs with at most 2000 nodes via our mechanism.

### Wireless Fingerprinting Prediction and Localization | SJTU | Advisor: Xiaohua Tian Sept. 2016 - Mar. 2017

- Modeled the fingerprint prediction as a matrix completion problem, and proposed an algorithm based on the Stiefel manifold for prediction based on Singular Value Decomposition and QR Decomposition.
- Designed a sliding-window mechanism to overcome the sparsity of fingerprints in real implementation.
- Showed that 71% and 98% users can be localized within an error of 100m and 300m respectively in a 69.8km<sup>2</sup> urban region.

## HONORS & AWARDS

- Oge Ho-Ching and Han-Ching Fund Award Fellowship, MIT 2020
- Outstanding Winner (INFORMS Award), Mathematical Contest of Modeling (Problem C), only 1 in all 4748 teams 2018
- IEEE INFOCOM Travel Grant, only for student presenters in INFOCOM 2018

## TEACHING EXPERIENCES

### Teaching Assistant, Course 16.36/16.363: Communication Systems & Networks, MIT Spring 2020

- Modulation; Channel Coding; ARQ; CSMA, etc. (Psets & Exams)

### Teaching Assistant, Course CS214: Algorithm and Complexity, SJTU Spring 2018

- Linear Programming; Greedy Algorithm; Amortized Analysis; Graph Algorithm; Approximation Algorithm. (Psets & Exams)