Qianqian **Ma**

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Education

Ph. D Candidate — *Boston, USA*

Boston University, Electrical and Computer Engineering — *Sep. 2017 - Present*

- Research: Distributed optimization and Machine Learning. Advisor: Alex Olshevsky. GPA: 3.6/4.0

Master of Engineering — *Harbin, China*

Harbin Institute of Technology, Electrical Engineering — *Sep. 2015 - Jul. 2017*

- Research: Optimization and Control. Advisor: Guangcheng Ma. GPA: 3.4/4.0

Bachelor of Engineering — *Harbin, China*

Harbin Institute of Technology, Electrical Engineering — *Aug. 2010 - Jun. 2014*

- Major: Automation. GPA: 3.5/4.0

Research Interests

Optimization, Machine Learning, Distributed and networked systems

Skills

Operation System: Windows, Linux (Ubuntu), and MacOS

Languages: Python, MATLAB, C/C++

Software: MATLAB/Simulink, TensorFlow, PyTorch, Multisim, Pspice, Quartus

Research Experience

Optimal Lockdown for Pandemic Stabilization — *Boston, USA*

Research Assistant, Boston University, ECE Department — *Jun.2020-Present*

- Proposed two efficient algorithms to compute the optimal lockdown policy for various epidemic models (SIS, SIR, SEIR, and a new COVID-19 model with symptomatic and asymptomatic individuals)
- Implemented simulations based on available data about COVID-19 break in New York State, and demonstrated a number of previously unknown counter-intuitive phenomenon

Adversarial Crowdsourcing through Robust Rank-One Matrix Completion — *Boston, USA*

Research Assistant, Boston University, ECE Department — *Mar. 2019 - May. 2020*

- Proposed a new rank-one matrix completion algorithm with unknown and arbitrary perturbations
- Apply the proposed algorithms to solve crowdsourcing classification problems with arbitrary adversaries.

Graph Representation Learning — *Boston, USA*

Research Assistant, Boston University, ECE Department — *July. 2019 - Sep. 2019*

- Investigated a graph representation learning framework for wide range of down-stream machine learning tasks
- Provided the theoretical analysis support for the effectiveness of the proposed graph learning framework

Projection Free Online Learning in Low-rank Matrix Completion — *Boston, USA*

Research Assistant, Boston University, ECE Department — *May. 2018 - Sep. 2018*

- Proposed a new projection-free online learning algorithm for low-rank matrix completion problem
- Proved the regret bound for the proposed algorithm and implemented simulation experiments

Structural Controllability and Network Control — *Boston, USA*

Research Assistant, Boston University, ECE Department — *Sep. 2017 - Jan. 2018*

- Provided a new and simplified proof for Lin's method to verify if a control system was structural controllable based on perfect matching method

Fuzzy H_∞ filter design for nonlinear systems with time-varying delay — *Harbin, China*

Research Assistant, Harbin Institute of Technology, Space Control Technology Lab — *Mar. 2016 - May. 2017*

- Established the mathematical model of the nonlinear filtering error system; Constructed three different stability conditions based on different integral inequalities
- Designed corresponding H_∞ filters by means of the conventional PDC methodology and novel imperfect premise matching methodology, respectively

The stability and stabilization analysis of nonlinear system with time-delay *Harbin, China*

Research Assistant, Harbin Institute of Technology, Space Control Technology Lab *Oct. 2015 - Feb. 2016*

- Proposed an improved stability criterion in terms of a new integral inequality for the nonlinear system with distributed time-delay
- Constructed corresponding stabilization criteria through the novel imperfect premise matching approach

The attitude control of the satellite and its semi-physical simulation *Harbin, China*

Research Assistant, Harbin Institute of Technology, Space Control Technology Lab *Jan. 2014 - Jun. 2014*

- Designed a novel attitude control algorithm based on the sliding model theory and feedback linearization approach, and implemented simulation experiments based on the MATLAB/SIMULINK

Publications

1. **Qianqian Ma**, Yang-Yu Liu, Alex Olshevsky, "Optimal Lockdown for Pandemic Stabilization," *Preprint,* 2020
2. **Qianqian Ma**, Alex Olshevsky, "Adversarial Crowdsourcing Through Robust Rank-One Matrix Completion," *2020 Neural Information Processing Systems (NeurIPS)*
3. Lichen Wang, Bo Zong, **Qianqian Ma**, Wei Cheng, Jingchao Ni, Wenchao Yu, Yanchi Liu, Dongjing Song, Haifeng Chen, Yun Fu, "Inductive and Unsupervised Representation Learning on Graph Structured Objects," *2020 International Conference on Learning Representations (ICLR)*
4. Can Qin, Lichen Wang, **Qianqian Ma**, Yu Yin, Huang Wang, Yun Fu, "Opposite Structure Learning for Semi-supervised Domain Adaptation," *arXiv preprint arXiv:2002.02545,* 2020
5. **Qianqian Ma**, Hongwei Xia, Guangcheng Ma, Yong Xia, Chong Wang, "Improved stability and stabilization criteria for T-S fuzzy systems with distributed time-delay," *2017 Data Mining and Big Data (DMBD),* p 517-526, 2017
6. **Qianqian Ma**, Li Li, Guangcheng Ma, Daling Jia, Hongwei Xia, "A new fuzzy H_∞ filter design for nonlinear time-delay systems with mismatched premise membership functions," *IFAC - Papers Online,* v 50, n 1, p 1433-1438, July 2017
7. **Qianqian Ma**, Li Li, Junhui Shen, Haowei Guan, Guangcheng Ma, Hongwei Xia, "Improved fuzzy H_∞ filter design method for nonlinear systems with time-varing delay," *2017 IEEE International Conference on Systems, Man and Cybernetics (SMC),* p 722-727, 2017
8. **Qianqian Ma**, Lili, Hongwei Xia, Mingyang Yang and Guangcheng Ma, "New Results on Stability and Stabilization Analyses for T-S fuzzy Systems with Distributed Time-Delay under Imperfect Premise Matching," *2016 ICICIP, Angkor, Cambodia,* p 143-148
9. Lili, **Qianqian Ma**, Hongwei Xia, Guangcheng Ma and Dali Zhang, "New H_∞ Filter Design Approach for Time-Delay Fuzzy-Model-Based System under Imperfect Premise Matching," *2016 ICICIP, Angkor, Cambodia,* p 5-10

Working Experience

Teaching Assistant *Boston, USA*

ENG EC503 (Learning from Data) *2018fall, 2019Spring*

- A **machine learning** course covering the general theories, algorithms, and applications of machine learning tasks.
- The course focus on the following major classes of supervised and unsupervised learning problems: classification, regression, density estimation, clustering, dimensionality reduction, kernels, robustness regularization, and neural networks

Teaching Volunteer *Yunnan, China*

Ninglang No.1 Senior High School of Yunnan Province *Jul. 2014 - Jul. 2015*

- Worked as a **full-time teacher for 1 year time** in a senior high school which locates in Yunnan province of china. It was a voluntary project for graduate student of HIT

Awards

2016.09 The First Prize of Post-Graduate Students Scholarship Recipient
2016.05 The *May-4th Medal* for Excellent Youth (**top 0.1%**)
2016.03 The *University-level Outstanding Communist Youth member*
2015.09 The First Prize of Post-Graduate Students Scholarship Recipient
2012.10 The *China-Survey* University Students Social Research Scholarship Recipient (**top 2.5%**)
2011.03 The Second Prize of Renmin Scholarship Recipient