Bai Liu

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http://bailiu.me

EDUCATION

June 2019 – Current
Massachusetts Institute of Technology, Cambridge, MA
- Ph.D. Candidate at Laboratory for Information and Decision Systems (LIDS)
- Major: Communications and Networks
- Minor: Machine Learning
- Also in Interdisciplinary Doctoral Program in Statistics (IDPS)
- Expected to graduate between Fall 2022 and Spring 2023

August 2017 – May 2019
Massachusetts Institute of Technology, Cambridge, MA
- Master of Science in Aeronautics and Astronautics
- GPA: **5.0/5.0**

August 2013 – July 2017
Tsinghua University, Beijing, China
- Bachelor of Engineering in Automation (with the highest honor)
- Bachelor of Economics in Economics (second degree)
- GPA: **93/100** Ranking: **1st/118**

COURSES AT MIT

Networks	6.263 Data Communication Networks, 16.363 Communication Systems Engineering, 16.393 Statistical Communication and Localization Theory
Prob & Stat	6.436 Fundamentals of Probability, 6.434 Statistics for Engineers and Scientists, 9.S914 Mathematical Statistics: A Non-Asymptotic Approach, IDS.131 Statistics, Computation, and Applications
Mach. Learn.	6.246 Reinforcement Learning: Foundations and Methods, 6.437 Inference and Information
Optimization	6.251 Introduction to Mathematical Programming, 6.252 Nonlinear Optimization

WORK EXPERIENCE

May 2020 – August 2020
Google, Google Cloud, Intern
- Designed and implemented a data center routing algorithm to balance the network traffic
- Developed a new data loss rate prediction model
- Applied reinforcement learning methods to optimize data center structures

June 2016 – September 2016
Stanford University, Information Systems Laboratory, Research Assistant
- Proposed and rigorously proved original properties of layered Gaussian relay network
- Designed adaptive algorithms to accelerate locating optimal global sub-network

January 2016 – March 2016
Imperial College London, Centre for Transport Studies, Research Assistant
- Introduced a transportation network model with feedback scheme to mitigate traffic congestion
- Established a simulation platform and conducted simualtions using real traffic data

January 2015 – March 2015
Wuxi Huatong Intelligent Transportation Technology Development Co., Ltd., Intern
- Proposed a regional road networks guidance scheme
- Designed and built a comprehensive traffic management web client connected to real-time traffic database

PUBLICATIONS & MANUSCRIPTS

Submitted **Tracking MaxWeight*: Optimal Control for Partially Observable and Controllable Networks**
Bai Liu, and Eytan Modiano.
IEEE/ACM Transactions on Networking.

Submitted **RL-QN: A Reinforcement Learning Framework for Optimal Control of Queueing Systems**
Bai Liu, Qiaomin Xie, and Eytan Modiano.
ACM Transactions on Modeling and Performance Evaluation of Computing Systems. [ArXiv]

November 2021 **Optimal Control for Networks with Unobservable Malicious Nodes**
Bai Liu, and Eytan Modiano.
Performance Evaluation.

September 2019 **Reinforcement Learning for Optimal Control of Queueing Systems**
Bai Liu, Qiaomin Xie, and Eytan Modiano.
57th Annual Allerton Conference on Communication, Control, and Computing.

May 2016 **Global Optimization Framework for Real-time Route Guidance via Variable Message Sign**
Bai Liu, Ke Han, and Jianming Hu [ArXiv]

PATENT & SOFTWARE COPYRIGHT

June 2016 **Global Optimization Framework for Real-time Route Guidance via Variable Message Sign**
Jianming Hu, Xin Pei, **Bai Liu**, *et al*.
Chinese Invention Patent. Publication Number: CN105303856A.

February 2016 **Intelligent Networking Transportation Guidance System Platform V1.0**
Computer Software Copyright. Registration Number: 2016SR252223.

HONORS

July 2017 **Excellent Graduate Award**
The highest honor for undergraduate students

June 2016 **Fellowship of Stanford Undergraduate Visiting Researcher Program**, Stanford University
Top undergraduate research program, only 18 students in China are selected annually.

March 2016 **Qualcomm Scholarship**, Tsinghua University
Awarded to students with excellent scientific potential (top 0.3%).

October 2012 **1st Prize in the National Mathematical Olympiad**, Chinese Mathematical Society (CMS)

October 2012 **2nd Prize in the Chinese Physics Olympiad**, Chinese Physical Society (CPS)

PROGRAMMING SKILLS

Proficient `Python`, `C/C++`, `MATLAB`, LaTeX

Familiar `Mathematica`, `SQL`, `Oracle`