

## EDUCATION

- June 2019 **Massachusetts Institute of Technology**, Cambridge, MA
- Current
  - 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)
  - Advisor: Eytan Modiano
- August 2017 **Massachusetts Institute of Technology**, Cambridge, MA
- May 2019
  - Master of Science in Aeronautics and Astronautics
  - Laboratory for Information and Decision Systems (LIDS)
  - GPA: **5.0/5.0**
- August 2013 **Tsinghua University**, Beijing, China
- July 2017
  - Bachelor of Engineering in Automation
  - Bachelor of Economics in Economics (Second Degree)
  - GPA: **93/100** Ranking: **1<sup>st</sup>/118**
  - Graduated with Outstanding Honor (Top 1%)

## COURSES AT MIT

- 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
- Networks 6.263 Data Communication Networks

## WORK EXPERIENCE

- May 2020 **Google**, Systems Infrastructure, Intern
- August 2020
  - Designed and implemented a data center routing algorithm that helps to balance the network traffic
  - Developed a new data loss rate prediction model that reduces the prediction error by more than 60% compared with the existing model
  - Applied reinforcement learning methods to data center traffic topology optimization and reduces the data loss rate by more than 20% compared with the current topology
- June 2016 – **Stanford University**, Information Systems Laboratory, Research Assistant
- September 2016
- Proposed and rigorously proved six original properties of layered Gaussian relay network
  - Designed adaptive algorithms based on a dynamic programming method that can locate optimal global sub-network exponentially faster
- January 2016 **Imperial College London**, Centre for Transport Studies, Research Assistant
- March 2016
  - Introduced feedback scheme into a transportation network model and applied the linear decision rule and heuristic optimization approach to design optimization algorithm
  - Established a simulation platform and conducted a simulation case study on a real-life test network in China

- January 2015 **Wuxi Huatong Intelligent Transportation Technology Development Co., Ltd.**, Intern  
– March 2015 – Successfully designed a guidance scheme based on regional road networks and implemented simulation  
– Designed and built a comprehensive traffic management system web client connected to real-time traffic database  
– Applied for a patent as the third author (CN105303856A)

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## PUBLICATIONS & MANUSCRIPTS

- 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.*
- August 2016 **Efficiently Reaching the Largest Wireless Capacity with the Fewest Relays**  
[Bai Liu](#), Xiugang Wu, and Ayfer Özgür  
Presented at *Stanford UGVR Program Workshop*. [[Poster](#)]
- May 2016 **Global Optimization Framework for Real-time Route Guidance via Variable Message Sign**  
[Bai Liu](#), Ke Han, and Jianming Hu [[ArXiv](#)]

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## 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.

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## HONORS

- July 2017 **Excellent Graduate Award(s)**  
Won Excellent Graduate Award for three times (Beijing City, Tsinghua University and Department of Automation respectively).
- 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 **1<sup>st</sup> Prize in the National Mathematical Olympiad**, Chinese Mathematical Society (CMS)
- October 2012 **2<sup>nd</sup> Prize in the Chinese Physics Olympiad**, Chinese Physical Society (CPS)

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## PROGRAMMING SKILLS

- Proficient Python, C/C++, MATLAB,  $\text{\LaTeX}$   
Familiar Mathematica, SQL, Oracle