Bai Liu

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🖥 http://bailiu.me

EDUCATION

June 2019 – December 2022
Massachusetts Institute of Technology, Cambridge, MA
- Ph.D. in Communications, Networks and Statistics
- Minor: Machine Learning

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**

WORK EXPERIENCE

December 2022 – Current
Google, ML HPC Networking, Software Engineer
- Optimized collective operations in GPU level to minimize the latency for large scale AI training tasks
- Optimized the NCCL network plugin to achieve higher traffic throughput
- Designed and implemented new algorithms to improve the performance of collective operations

May 2022 – August 2022
Meta (Facebook), Ads Core ML, Intern
- Designed and implemented a new on-device ranking scheme to serve users' real-time interests better
- Developed a new Ads request scheme to fetch Ads faster from the backend
- Conducted global-scale online experiments in the production environment to test the new schemes

May 2020 – August 2020
Google, Fabric Core Team, 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

COURSES AT MIT

Networks 6.263 Data Communication Networks, 6.829 Computer 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

SELECTED PUBLICATIONS

December 2022
Tracking MaxWeight*: Optimal Control for Partially Observable and Controllable Networks
Bai Liu, and Eytan Modiano.
IEEE/ACM Transactions on Networking.

April 2022
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]