BAI LIU

2# Zijing Student Apartment ◇ Tsinghua University ◇ Beijing, 100084, P.R.China
(+86) 18810917624 ◇ liubaichn@gmail.com ◇ http://bailiu.me

EDUCATION

Tsinghua University, Beijing, China *2013.08 - 2017.07 (expected)*

· Bachelor of Engineering in Automation (expected)
· GPA: **93/100** Ranking: **1st/118**

Stanford University, Stanford, CA, USA *2016.06 - 2016.09*

· Research Assistant in the Information Systems Laboratory, Department of Electrical Engineering
· The Undergraduate Visiting Research (UGVR) Program (18 students selected from China)

Imperial College London, London, UK *2016.01 - 2016.02*

· Research Assistant in the Centre for Transport Studies

Core Courses

· **Mathematics**: Probability and Statistics (94/100), Linear Algebra (93/100), Calculus (91/100), Numerical Analysis and Algorithms (93/100), Applied Stochastic Processes (92/100), Introduction to Complex Analysis (99/100)
· **Programming**: C++ Programme Design and Training (94/100), Introduction to Systems Engineering (99/100), Multimedia Technology and Its Applications(99/100), Fundamental Pattern Recognition (94/100), Computer Principles and Applications(93/100)

SCHOLARSHIPS AND AWARDS

2016 & 2015 Fang Chongzhi Scholarship (Highest honor in the Dept. of Automation, 1 out of 560)
2014 China National Scholarship (Highest scholarship set by the government of China, $< 0.1\%$)
2016 Qualcomm Scholarship (Awarded to students with excellent scientific potential, 0.3%)
2016 Tang Lixin Scholarship (Awarded to students with outstanding academic performance, 0.2%)
2016 Cai Xiong Scholarship (Awarded to students with excellent scientific potential, 0.5%)
2012 1st Prize in the National Mathematical Olympiad ($< 0.01\%$)
2012 2nd Prize in the National Physics Olympiad ($< 0.05\%$)

PUBLICATIONS AND MANUSCRIPTS

[1] **Bai Liu**, Jianming Hu, Pan Gao, and Xudong Xie. Dynamic Traffic Guidance Generating Method on Variable Message Sign in Small and Medium-Sized Cities. *14^{th} ITS Asia Pacific Forum*. Full version accepted. Invited to deliver oral presentation.

[2] **Bai Liu**, Ke Han, and Jianming Hu. Global Optimization Framework for Real-time Route Guidance via Variable Message Sign. *Submitted to Transportmetrica A*. Under review.

[3] **Bai Liu**, Xiugang Wu, and Ayfer Özgür. Efficiently Reaching the Largest Wireless Capacity with the Fewest Relays. *In preparation for submission.*

RESEARCH EXPERIENCES

Stanford University, Stanford, CA, USA *2016.06 - Present*
Information Systems Laboratory, Department of Electrical Engineering
Research Assistant, Advisor: **Prof. Ayfer Özgür**

Project: Sub-network Selection of Gaussian Relay Network

· 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

· Designed efficient algorithms for the cases with dynamic parameters
· Established a simulation platform (MATLAB-based, $> 2,000$ lines of codes)
· Accomplished all work independently

Imperial College London, London, UK *2016.01 - 2016.02*
Centre for Transport Studies
Research Assistant, Advisor: **Prof. Ke Han**

Project: Dynamic Transportation Network Modeling
· Introduced feedback scheme into a transportation network model
· Applied the linear decision rule and heuristic optimization approach to design optimization algorithm
· Established a simulation platform (MATLAB-based, $> 3,000$ lines of codes)
· Conducted a simulation case study on a real-life test network in China

Tsinghua University, Beijing, China *2015.08 - Present*
Institute for Interdisciplinary Information Sciences (IIIS)
Research Assistant, Advisor: **Prof. Longbo Huang**

Project 1: Management Scheme of Auto-Driving Vehicles
· Utilized dynamic programming and stochastic networks methods
· Proved the upper bound of the total number of vehicles required for balancing
· Proposed a polynomial-time algorithm to obtain the optimal scheduling policy
· Extended the model to stochastic cases
· Successfully established a model simulation platform (Mathematica-based)

Ongoing project : Auto-Driving Management with Queueing
· Co-advisor: Dongning Guo, Professor in the Department of Electrical Engineering & Computer Science, Northwestern University
· Applied fluid model and introduced queueing theory
· Proposed and proved several properties

Tsinghua University, Beijing, China *2015.01 - 2015.07*
Institute of System Engineering, Department of Automation
Research Assistant, Advisor: **Prof. Jianming Hu**

Project: Dynamic Traffic Guidance Scheme Design
· Successfully designed a guidance scheme based on regional road networks and implemented thorough simulation
· Designed and built a comprehensive traffic management system web client ($> 9,000$ lines of codes)

PATENTS AND SOFTWARE COPYRIGHTS

[1] Jianming Hu, Xin Pei, **Bai Liu**, *et al.* Variable Message Sign Information Release Method of Prediction Model. *Chinese Invention Patent.* Publication Number: CN105303856A. Publication Date: 2016.02.03.

[2] Intelligent Networking Transportation Guidance System Platform [INGSP] V1.0. *Computer Software Copyright.* Registration Number: 2016SR252223. Date: 2016.06.01.

PROGRAMMING SKILLS

Proficient	MATLAB(>20k lines), C/C++(>20k lines), C#(>10k lines), LaTeX
Familiar	Wolfram, SQL, Oracle, Git, Javascript, HTML/CSS

LANGUAGE SKILLS

TOEFL iBT	107/120 (Reading 30, Listening 28, Speaking 23, Writing 26)
GRE	324/340+3.5/6.0 (Verbal 154/170, Quantitative 170/170, Analytical Writing 3.5/6.0)