BAI LIU

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EDUCATION

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

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

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

· The Chinese Undergraduate Visiting Research (UGVR) Program, only 18 students selected from China
· Undergraduate visiting research assistant in Department of Electrical Engineering

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

· Undergraduate visiting research assistant in Centre for Transport Studies

Relative Courses

· **Research**: Student Research Training (99/100), Literature Searching and Utilization (98/100)
· **Mathematics**: Introduction to Complex Analysis (99/100), Probability and Statistics (94/100), Linear Algebra (93/100), Numerical Analysis and Algorithms (93/100), Applied Stochastic Processes (92/100)
· **Programming**: Introduction to Systems Engineering (99/100), Multimedia Technology and Its Applications(99/100), C++ Programme Design and Training (94/100), Fundamental Pattern Recognition (94/100)

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. *14th ITS Asia Pacific Forum*. Full version accepted. Invited to do 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*. Currently under review.

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

[4] Jianming Hu, Xin Pei, **Bai Liu**, *et al.* An Information Distribution Method of Variable Message Sign Based on Prediction Method. *Chinese Invention Patent.* Application ID: 201510768010.4. Date: 2015.11.12.

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

RESEARCH EXPERIENCES

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

Project: Subnetwork Selection of Gaussian Relay Network

· Proposed and rigorously proved six original properties of layered Gaussian relay network
· Designed adaptive algorithms based on dynamic programming method that can find optimal global subnetwork exponentially faster
· Designed efficient algorithms for the cases with dynamic parameters
· Established simulation platform
· Accomplished the whole work independently

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

· Used dynamic programming and stochastic networks methods
· Proved the upper bound of the total number of vehicles required for balancing
· Proposed a polynomial-time algorithm for obtaining the optimal scheduling policy
· Extended the model to stochastic cases
· Successfully established a model simulation platform

Ongoing project : Auto-Driving Management with Queueing

· Co-advisor: Dongning Guo, professor at Department of Electrical Engineering & Computer Science, Northwestern University
· Applied fluid model and introduced queueing theory
· Proposed and proved several properties

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 transportation network model
· Applied linear decision rule and heuristic optimization approach to design optimization algorithm
· Established a simulation platform ($> 3,000$ lines of codes)
· Conducted simulation case study on a real-world test network in China

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 guidance scheme based on regional road networks and made thorough simulation
· Designed and built a comprehensive traffic management system web client ($> 9,000$ lines of codes)

HONORS AND AWARDS

2016 & 2015 Fang Chongzhi Scholarship (Highest honor in the Dept. of Automation, 1 out of 560)
2016 Qualcomm Scholarship (Awarded to students with 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 scientific potential, 0.5%)
2015 Tsinghua Spark Talents Program (Undergraduate High-tech Club) Membership
2014 China National Scholarship (Highest level of scholarship set by the government of China, 2%)
2012 1^{st} Prize of National Mathematical Olympiad ($< 0.01\%$)
2012 2^{nd} Prize of National Physics Olympiad ($< 0.05\%$)

TECHNICAL STRENGTHS

Programming Languages	Proficient in C/C++, Matlab, Mathematica, C#, Web programming
Tools	LaTeX, git, SQL, Oracle

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)