BAI Cong

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· Education Background ·

2016/09--2018/08 **Hong Kong University of Science and Technology (HKUST)** **Master of Philosophy (MPhil)**

Major: Civil Engineering **GPA:** 3.7 / 4.0 **Supervisor: Prof. Yang Hai, Dr. Wang Xiao-Lei**

Main courses: Urban Transportation Networks Analysis (A+), Travel Demand Analysis (A-), Microeconomic Theory (B+), Deterministic Models in Operations Research (A-)

2013/09--2016/05 **Shanghai Jiao Tong University (SJTU)** **Master in Engineering**

Major: Transportation Engineering **GPA:** 2.6 / 3.0 **Supervisor: Prof. Peng Zhong-Ren**

Main courses: Transportation Engineering Theory and Method (A-), Transportation Statistical Analysis and Modeling (A+), Optimal Estimation and System Modeling (A-), Theory and Method in Transportation Planning (A-), Transportation Safety (A)

2009/09--2013/06 **Southwest Jiaotong University (SWJTU)** **Bachelor in Engineering**

Major: Traffic and Transportation **GPA:** 3.6 / 4.0 **Ranking in Department**: 2 / 260

Main courses: Operation Research I/II (90/91), Organization of Train I/II (95/92), Operation Research Urban Rail Traffic Plan and Design (93), Management of Database System (93), Principles of Transportation Planning (91)

· Qualifications and Skills ·

- **IELTS**: an overall score of **7.0** (Listening 8.0, Reading 8.0, Writing 6.5, Speaking 6.0).
- Expert at programming with **Visual Studio (C#)** and secondary development based on **ArcGIS Engine**;
  - Software programming and secondary development based on ArcGIS Engine (two copyrights of computer software).
- Expert at big data processing, analysis and modeling with **MATLAB**, **SQL Server**, **Access** and **Excel**;
  - The **Second Prize** in National Post-Graduate Mathematic Contest in Modeling for **two times**;
  - Pass the National Computer Rank Examination and achieved Grade 4 (highest grade) in Database Engineer.
- Good at developing smartphone App based on **Android** platform (**Java**), and using **ArcGIS**, **AutoCAD**.

· Awards & Honors ·

HKUST	• Postgraduate Studentship (PGS) for 2017/2018 Academic Year • Postgraduate Studentship (PGS) for 2016/2017 Academic Year
SJTU	• **National Scholarship for Graduate Students** (Top 1%, Dec 2014) • **Outstanding Graduates of Shanghai City** (Top 1%, Mar 2016) • Tung OOCL Scholarship (Top 5%, Dec 2015) • Merit Student of SJTU (Top 5%, Oct 2014) • Outstanding League Cadres of SJTU (Only 0.5%, May 2014) • **Second Prize in National Post-Graduate Mathematic Contest in Modeling** (Dec 2013, Dec 2014)
SWJTU	• **National Scholarship for Undergraduate Students** (Top 1%, Nov 2012) • National Endeavor Scholarship for Undergraduate Students (Top 10%, Nov 2011) • **Outstanding Graduates of Sichuan Province** (Top 1%, Jan 2013) • **"Si-Shi-Yang-Hua" Medal** (Highest honor for students at SWJTU, only 0.1%, Nov 2012) • Merit Student of SWJTU (Top 5%, Nov 2010) • **First Prize in National Competition of Transport Science and Technology for Students** (May 2012)

· Publication ·

[1] **Bai Cong***, Yang Hai, Wang Xiao-Lei. Compensation Schemes and Commute Equilibrium for Mixed Ridesharing Program with Autonomous Vehicles (AVs) And Traditional Vehicles (TVs). Working paper.

[2] **Bai Cong**, Wang Xiao-Lei*, Yang Hai, Liu Wei. Ridesharing: Long Term Impacts on Private Car Ownership. Transportation Research Part E: Logistics and Transportation Review. Under Review.

[3] **Bai Cong**, Peng Zhong-Ren*, Lu Qing-Chang, Sun Jian. Dynamic Bus Travel Time Prediction Models on Road with Multiple Bus Routes[J]. Computational Intelligence and Neuroscience, 2015 (2015): 63. **(SCI, 15 citations)**

[4] **Bai Cong**, Peng Zhong-Ren*. A Dynamic Prediction Model for Bus Travel Time Based on Support Vector Machine and Kalman Filtering-Based Algorithm[J]. Computer Engineering and Applications. 2016, 52(3):103-7. **(Chinese Core Journals, 4 citations)**

[5] **Bai Cong**, Peng Zhong-Ren*, Sun Jian. Bus Travel Data Collection and Analysis Based on Smartphone Application[J]. Science Technology and Engineering, 2014, 14(21): 293-296. **(Chinese Core Journals, 4 citations)**

[6] **Bai Cong**, Wang Hong-Wei, Peng Zhong-Ren*. Real-time Monitoring and Emergency Rescue System Development for Dangerous Goods [J]. Science Technology and Engineering, 2014, 14: 298-302. **(Chinese Core Journals, 3 citations)**

· Research Experience ·

2016/12--present **"Cost Allocation and Equilibria in The Ridesharing Program"**

- **Long-term impacts of ridesharing on private car ownership and the driver-rider cost sharing strategies;**

  This study mathematically models the long-term impacts of ridesharing on travelers' vehicle purchase behavior, considering the interactions between the attractiveness of ridesharing, matching probabilities and travelers' mode choices under different car ownership status. When the variance of ridesharing matching probabilities is ignorable, we establish the properties of cost sharing strategies that can slow down the increase of car ownership.

- **Compensation schemes and equilibria for ridesharing with autonomous vehicles and traditional vehicles.**

  We study the morning commute problem with three travel modes: driving alone, traditional vehicles ridesharing (TV-RS) and autonomous vehicles ridesharing (AV-RS). To reach an internal equilibrium and ensure a positive ridership in ridesharing, we propose the appropriate compensation schemes. We establish the user equilibrium (UE) among the three travel modes governed by the bottleneck model, and examined the system optimum (SO) condition.

2014/09--2016/04 **"Dynamic Bus Arrival Time Prediction Methods Based on The Big Data"**

- **Data preprocessing:** Import the raw data into SQL Server and build a database for data extraction; Use ArcGIS for GPS coordinate transformation, and use the Model Builder to identify bus lines;
- **Dynamic models:** Propose dynamic bus arrival time prediction models, i.e., Support Vector Machine (SVM)-Kalman and Artificial Neural Network (ANN)-Kalman models, and compare the results with the pure Kalman/ SVM/ ANN models.

2012/09--2014/09 **"Development of App for Real-Time Traffic Information Collection Research and Travel Mode Detection"**

- **Mobile App Development (Java):** Real-time positioning using Baidu Map SDK, travel information (e.g., speed, acceleration, GPS coordinates, travel mode) collection, SQLite-based data storage, and data uploading;
- **Manage Website Development (C#):** Travel details view and edit, visualization of travel trajectory using Baidu Map, receiving and processing of data files from mobile App, and database management;
- **Travel Mode Detection:** Use Particle Swarm Optimization (PSO)-SVM for travel mode detection where PSO algorithm optimizes the SVM parameters, and compare the prediction results with BP Neural Network (BPNN), Grid Search (GS)-SVM model and Genetic Algorithm (GA)-SVM.

2011/09--2012/06 **"Monitoring and Rescue System Development for Transporting Dangerous Goods Based on ArcGIS Engine"**

- **Transportation Company Monitoring Platform (Software, C#):** Map display and operations dashboard, real-time vehicle location display, alarm, OpenCV-based driver fatigue monitoring, and traveling path recommendation;
- **Emergency Command Center Platform (Software, C#):**Map operations, polluted area simulation based on Gaussian Plume Model, rescue paths recommendation, and crowd evacuation from the polluted area;
- **Vehicle-Mounted Device (Hardware):** Data transmission, real-time positioning, video processing, and alarm.
- **First prize** in National Competition of NACTranS (Video Introduction: https://url.ms/yay67).

· Patents & Copyrights ·

[1] Peng Zhong-Ren, **Bai Cong**, et al. "A Real-Time Traffic Parameter Collection Device Based on Bluetooth and Inductive Loop Technology". **Invention Patent**. 201510249779.5. **Granted** on 2017-09-08.

[2] Peng Zhong-Ren, Wang Zhan-Yong, Wang Dong-Sheng, **Bai Cong**, et al. "Data Collection Method for Air Pollutants in Industrial Park Based on Unmanned Aerial Vehicles". **Invention Patent**. 201510292812.2. **Granted** on 2016-05-25.

[3] **Bai Cong**, Wang Hong-Wei, et al. "The Command Center System for Road Dangerous Goods". **Software Copyright**. 2015SR011355. **Granted** on 2015-01-21.

[4] **Bai Cong**, Xu Ying-Chun, et al. "The Monitoring and Rescue System for Road Dangerous Goods". **Software Copyright**. 2014SR033451. **Granted** on 2014-03-24.

· Internship ·

2013/07--2013/08 **The Second Surveying and Mapping Institute of Zhejiang Province** Hangzhou, Zhejiang, China

- Experimental design and data collection for air pollutant (PM2.5/PM10/SO2) with unmanned aerial vehicles;
- Learning to operate the unmanned aerial vehicles with the flight simulator.

2010/03--2013/06 **Yanghua Studio (Yanghua E Media Center)** Chengdu, Sichuan, China

- Learn the skills of website development (**Software: Visual Studio; Language: C#; .NET framework**) i.e., Official website of the Department of Astronomy at SJTU (http://astro.sjtu.edu.cn/English);
- Training new members, organizing culture activities, arranging working plans, and reporting to supervisor.

· Extracurricular Activity ·

2014/09--2015/07	**Vice President**	Graduate Student Union of School of NAOCE at SJTU
2011/09--2013/03	**Chairman**	Yanghua Studio at SWJTU
2009/09--2010/09	**Class Monitor**	Mao-Yisheng Honors Class at SWJTU