Dingyi ZHUANG

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EDUCATION

McGill University
Montreal, Canada
Master (Thesis) in Transportation Engineering *Sep. 2019- Present*

- **Instructor:** Prof. Lijun Sun
- **Research interest:** Urban Computing, Data Mining, Graph Network
- **CGPA: 3.65**/4

Shanghai Jiao Tong University
Shanghai, China
Bachelor of Science in Mechanical Engineering *Sep. 2015 - July. 2019*

- **Tsien Hsue-Shen Class:** Honors Program in Shanghai Jiao Tong University (top **5%**).
- **Overall GPA: 3.55**/4 (**85.67**/100), **Ranking: 3**/8

Selected Honors & Awards:

- Graduate Excellence Fellowship, McGill University
- First Prize (1/130), Chinese University Students Big Data Innovation Application and Modeling Contest
- Chungtsung Scholarship (10%), Hui-Chun Chin and Tsung Dao Lee Endowment Program Commission
- Eleme Scholarship (5%, twice), Shanghai Jiao Tong University
- Excellent Student (5%), Shanghai Jiao Tong University

PUBLICATIONS

- **D.Y. Zhuang**, J.G. Jin, Y.F Shen, W. Jiang, An empirical study on cycle lane network using bike sharing data: the case of Shanghai, *2018 International Conference on Transportation and Space-time Economics*.
- **D.Y. Zhuang**, J.G. Jin, Y.F Shen, W. Jiang, Understanding the bike sharing travel demand and cycle lane network: the case of Shanghai, *International Journal of Sustainable Transportation*.
- **D.Y. Zhuang**, S.Y. Hao, D.H. Lee, J.G Jin, From compound word to metropolitan station: Semantic similarity analysis using smart card data, *Transportation Research Part C: Emerging Technologies*.
- S.Y. Hao, **D.Y. Zhuang**, D. Zhao, D.H. Lee, A Pseudo-3D Convolutional Neural Network based Framework for Short-term Mixed Passenger Flow Prediction in Large-scale Public Transit, *Transportation Research Board 2020*.
- F.Q. Liu, J.W. Wang, **D.Y. Zhuang**, J.B. Tian, Luis Miranda-Moreno, L.J. Sun. A General Framework Based on Temporally Dynamic Adjacency Matrix for Long-Term Traffic Prediction, *The 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*. (**Under review**)

RESEARCH EXPERIENCE

Dynamic Adjacency Matrix based Framework for Long-Term Traffic Prediction ***Canada***
Master Student, McGill University *Dec. 2019 - Feb. 2020*
Advisor: Lijun Sun, Assistant Professor, McGill University

- Introduced a general framework with Bias Block to improve the performance of seq2seq extreme long-time prediction.
- Used STGCN, DCRNN and GWNet as base model and chose Matrix Factorization, VAR and SVR as the baseline to prove that our model obtain higher accuracy and stronger interpretability.
- Paper submitted to *KDD'2020*

Bayesian Poisson Tensor Factorization for Learning Paratransit Mobility Patterns ***Canada***

Master Student, McGill University *Oct. 2019 - Dec. 2019*

Advisor: Lijun Sun, Assistant Professor, McGill University

- Derived and implemented Bayesian Poisson Tensor Factorization to learn latent patterns of paratransit service for the disabled people in the region-level.
- Discovered multiple peak-time, indifference between weekdays &weekends as temporal patterns and discuss the spatial regularity, to appeal for more researches of improving paratransit.

Pseudo-3D CNN based Framework for Short-term Mixed Passenger Flow Prediction ***Singapore***

Research Student, National University of Singapore *Apr. 2019 - Aug. 2019*

Advisor: Lee Der-Horng, Elected Fellow, Academy of Engineering Singapore

- Proposed a Pseudo-3D Convolutional Neural Network (Pseudo-3DCNN) based model to predict the public transport passenger flow in a network-wide region level.
- Took metro passenger flow, bus passenger flow as well as the transfer flow between metro system and bus system together into consideration instead of merely predicting a single type of passenger flow.
- Presented paper in *Transportation Research Board 2020.*

Understanding Semantic Similarity among Subway Stations Using Smart Card Data ***Singapore***

Research Student, National University of Singapore *Jul. 2018 - Sep. 2018*

Advisor: Lee Der-Horng, Elected Fellow, Academy of Engineering Singapore

- Designed a station2vec approach using word2vec model in natural language processing and proposed to interpret station vectors as compound words to comprehend their mobility and service semantics
- Applied stacked autoencoder on smart card data and topic modeling on Point of Interest data to discover the mobility and service semantics respectively to obtain a deeper similarity between subway stations
- Completed all modeling and coding work independently, and then proposed several urban planning and commercial suggestions based on similarity analysis

Empirical Study on Cycle Lane Network of Shanghai Using Bike Sharing Data ***Shanghai, China***

Team Leader, Chuntsung Program of Shanghai Jiao Tong University *Mar. 2017 - Jun. 2018*

Advisor: Jiangang Jin, Associate Professor at School of Civil Engineering, Shanghai Jiao Tong University

- Designed procedures to scrape data automatically from the bike-sharing application and applied graphic clustering to mine the insight of four different bike-sharing mobility patterns
- Suggested a method to explore cycle lane network based on bike-sharing mobility configurations and proposed policy recommendations accordingly
- Presented paper on TSTE 2018 and published in *International Journal of Sustainable Transportation*.

SELECTED PROJECTS

Chinese University Students Big Data Innovation Application and Modeling Contest *June 2017*

National Level *Shanghai Internet Big Data Engineering Technology Research Center*

- Realized precise portrayal (social behavior and internet habit) of the mobile phone users' portrait
- Extracted 8 million mobile phone users' features from more than 150TB China Telecom data with Hadoop and Spark, and then scraped Points of Interest data around telecom base stations with Python
- Processed Points of Interest data with MapReduce functions in MATLAB to label the service features of base stations

2017 Mathematical Contest in Modeling *Apr. 2017*

International Level *COMAP (Consortium for Mathematics and Its Application)*

- Led a team of three to analyze, modelling and planning on traffic lane network for autonomous vehicles

- Completed modeling, writing and typography with Latex and visualized data with Visio, Python and R

Health Cloud Services of Heart-Watchdog *Apr. 2016 – Apr. 2017*

Campus Level *Shanghai Jiao Tong University*

- Built commercial website of healthcare equipment Heart-Watchdog with HTML5 and CSS
- Launched commercial website on May 1, 2017 (http://heart-watchdog.com/)

SKILLS

- Programming: Python, R, C/C++, HTML
- Tools: MATLAB, Visio, Latex, MySQL, Hadoop, Origin
- Languages: TOEFL: 99/120 (Speaking: 22); GRE: 321+3 (AW)

MISCELLANEOUS

Vice President, Center of Quality Development, Student Union *May 2016-Sept. 2017*

Volunteer, UAES-SJTU Collaboration Agreement Signing Ceremony *Aug. 2017*

Outstanding Volunteer, 122nd Anniversary of Shanghai Jiao Tong University *Apr. 2018*

Hobbies: Reading (history, technology, psychology), Sports (basketball, running)