XIANGYU LI

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EDUCATION

University of California, Berkeley Berkeley, CA, USA
Master of Transportation Engineering Aug. 2022 – Jul. 2023 (expected)

Beijing Jiaotong University Beijing, China
Bachelor of Transportation Engineering Aug. 2018 – Jul. 2022

- GPA: **3.86/4.0**
- Core Courses: Operational Research in Management (95/100), Traffic Safety Engineering (97/100), University Physics (91/100), Urban Public Transportation (95/100), Traffic Management and Control (92/100), Traffic Engineering Theory (92/100), Road and Highway Engineering (90/100), Engineering Mechanics (90/100)

PUBLICATIONS & MANUSCRIPTS

[1] **Li, X.Y.**, Yin, Z.W., Wu, H., Hansen, M. Impact of Intracity Traffic Congestion on People's Choices of Housing, Workplace and Commute: Social Optimal Parsimonious Continuum Approach. *Transportation research part E: Logistics and Transportation Review* (Under review).

[2] Luo, S.D., **Li, X.Y.**, Wu, X.Y., Yin, Z.W., Xu S, & Kang, L.J. (2022). Modeling resident choices of residence, work locations and commutes in a two-city system for optimal urban design. *Journal of Tsinghua University (Science and Technology)*, 62(7), 1186-1194.

[2] **Li, X.Y.**, (2021, November). Finite Element Optimization Analysis of CFRP Reinforced Box Girder Bridge Under Traffic Load. In *2021 4th International Symposium on Traffic Transportation and Civil Architecture (ISTTCA)* (pp. 89-94). IEEE.

[2] **Li, X.Y.**, & Xie, M. (2021). Short-term passenger volume forecast and model analysis of Beijing public transport. In *Fifth International Conference on Traffic Engineering and Transportation System (ICTETS 2021)* (Vol. 12058, pp. 1423-1429). SPIE.

RESEARCH EXPERIENCE

University of California, Berkeley, Dept. of Mechanical Engineering Berkeley, CA, USA
Research Assistant to **Professor Gabriel Gomes** Aug. 2022 – Present
Ongoing Project: Traffic Lights control and path commendation Based on Reinforcement Learning

- Built a city-scale simulation platform based on simulation of urban mobility (SUMO)
- Proposed a traffic light control algorithm based on the deep Q-learning network (DQN) and Actor-to-critic (A2C)
- Proposed a RL agent using A2C to provide real-time path recommendations to commuters on which travel modes and routes to use
- Trained two agents with collaborative designs to minimize the generalized system cost under PM2.5 exposure

Hong Kong Polytechnic University, Dept. of Electronic and Information Engineering Hong Kong
May. 2022 – Aug. 2022
Ongoing project: Cyber-Physical System and Deep Reinforcement Learning-Enabled Driving Behaviour Study in Connected and Autonomous Driving System

- Proposed the construction of the cyber-physical system and Vehicle-to-everything (V2X) communication message design
- Collected driving behavior data based on emergency broadcast message scenarios
- Used proximal policy optimization (PPO) to train self-driving vehicles to adjust the certain scenarios

University of California, Berkeley, Dept. of Transportation Engineering Berkeley, CA, USA
Beijing Jiaotong University, Dept. of Transportation Engineering Beijing, China
Research Assistant to **Professor Mark Hansen** & **Professor Sida Luo** Dec. 2020 – Nov. 2022
Project: Game Theoretical Analysis for a Two-city Economic System

- Designed a system composed of two ring-radial cities connected by a high-speed rail with changing congestion

- Derived the Nash Equilibrium (NE) state of people's work and commute pattern distributions under different government interventions
- Proved several theorems such as no big city residents will choose to work in small city under the NE
- Provided policy implications for government to maximize social welfare based on a real-world two-city system
- Completed two papers in Transportation research part E and Journal of Tsinghua University.

Beijing Jiaotong University, Dept. of Transportation Engineering Beijing, China

Research Assistant to **Professor Yizheng Wu** Dec. 2021 – May. 2022

Project: Individual Particulate Matter Exposure for Urban Commuters

- Collected inhaled PM2.5 per second with a portable monitor under different travel modes (over 100 hours)
- Constructed the quantitative model of particulate matter exposure level
- Analyzed the exposure characteristics of particulate matter in different populations
- Predicted PM2.5 data and build a simulation scenario to put forward suggestions for government
- Wrote a thesis, rated as an Outstanding Undergraduate Graduation Thesis (top 5%)

Massachusetts Institute of Technology, Dept. of Civil Engineering Cambridge, MA, USA

Research Assistant to **Professor Oral Buyukozturk** Jul. 2021 – Aug. 2021

Project: Understanding Influence of Traffic Load on Bridges Using Finite Element Optimization Analysis

- Proposed the finite element model of a real box girder bridge using ABAQUS software
- Analyzed the influence of CFRP pasting directions and layers on the bridge under traffic load
- First-authored paper that was published in ISTTCA 2021

Beijing Jiaotong University, Dept. of Transportation Engineering Beijing, China

Research Assistant to **Professor Wei Guan** Mar. 2021 – Jun. 2021

Project: Forecast of Beijing Public Transport Passenger Volume under the COVID-19

- Collected and fill the public transit (PT) demand data and other associated data in Beijing for the past 40 years
- Applied deep neural network and multivariable linear regression to predict future PT demand influenced by the impact factor of health emergencies
- First-authored paper that was published in ICTETS 2021

AWARDS

Second Prize, 16th National Competition of Transport Science and Technology for University Students

Project: Ventilation Metamaterial Barrier for Traffic Noise Reduction

- Developed a metamaterial to achieve adequate control of low-frequency mechanical waves and solved the problem of noise pollution on traffic roads
- Designed a new split tube resonator of double-sided noise reduction, ventilation, and no reflector
- Applied local resonance mechanism to the noise reduction, which combined theories in acoustics, structural mechanics, and road traffic

COMPUTER SKILLS

Proficient Python, MATLAB, SUMO, Vissim, ArcGIS, Synchro, AutoCAD

Familiar C/C++, TransCAD