Lexing Zhang

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Education

Chang'an University, China (Project 211)   **Sept. 2021-Jul. 2025 (expected)**

- Department of Transportation, School of Transportation Engineering
- B.Eng. in Transportation
- GPA (first six semesters): 87.26/100
- Core courses: System Analysis Engineering (98); Fundamentals of College Computer (96); Carriage of dangerous goods (94); Engineering Surveying (93); Transportation Engineering Theory (93); GIS(geographic information system) (bilingual) (93); Engineering Mechanics (91); Engineering Drawing I (90);

National University of Singapore, Singapore   **Aug. 2024-May. 2025 (expected)**

- Civil and Environmental Engineering, College of Design and Engineering
- Non-graduating (Chinese PU 3+1+1)

Publications & Patents

1. Boyao Peng, **Lexing Zhang**, Enkai Li. Lane Level Joint Control of Off-Ramp and Main Line Speed Guidance on Expressway in Rainy Weather. 103rd Annual Meeting of Transportation Research Board (TRB 2024) (Accepted).
2. Boyao Peng, **Lexing Zhang**, Enkai Li, Yin Feng, Ying Zhang, li Zhong. Free-flow tolling system for expressway with fusion of 5G communication and high-precision positioning technology. The 4th International Conference on Smart City Engineering and Public Transportation (SCEPT2024) (Accepted).
3. Chen Ma, Baixi Shi, Yanqiu Cheng, **Lexing Zhang**, Kuanmin Chen. From Lockdown to Recovery: Modeling the Long-term Effects of COVID-19 on Xi'an's Metro Ridership. 104th Annual Meeting of Transportation Research Board (TRB 2025) (Accepted).
4. Enkai Li, Dong Ding, **Lexing Zhang**, Yang Chen, Rongzhen Li. A New Framework for Subway Passenger Flow Detection Based on Improved Feature Extraction and Fusion. Intelligent Transportation Infrastructure. under review.
5. Wenxuan wang, **lexing zhang**, boyan. Development of a Surrogate Safety Measure for Evaluating Rear-End Collision Risk Perception. Transportation Research Record. under review.
6. Wenxuan Wang, **Lexing Zhang**, Jiale Lei, Yin Feng, Hengxu Hu. Incorporating Traffic History Variables in Time-Series Acceleration Prediction Models for Highway Tunnel Exits Using Attention-Enhanced LSTM Networks. Prepared for the Journal of Intelligent Transportation System.
7. **Lexing Zhang**, Boyao Peng, Tinghuan Liang, Xiaoyun Cheng, Ying Zhang, Shaoxuan Zhu, Wanting Fan, Yi Zhao. National Invention Patent " A free-flow toll collection method and system for expressways". Under review.
8. Boyao Peng, **Lexing Zhang**, Enkai Li, Xiaoyun Cheng, Yin Feng, Li Zhong, Jiajun Zhu, Hengxu Hu, Jiale Lei, Haoyang Wu. National Invention Patent " A kind of induction method and system for the exit vehicle of the highway ramp toll station". Under review.

Academic Experience

Research on the Passing Efficiency of Highway Free Flow Tolling System   **Xi'an, China**

Leader   11/2021 – 11/2022

In this study, we built a free-flow tolling system for motorways and used a cellular automata traffic simulation model to evaluate the capacity of different ratios of the number of manual toll lanes, the number of ETC toll lanes, and the number of Free-flow toll lanes with different traffic volumes.

- Served as the project leader, in charge of supervising the schedule, and took a lot of technical work listed below:
  - Writing cellular automata traffic simulation code for capacity analysis
  - Establishment of an improved cellular automata traffic simulation algorithm and enhancement of the algorithm's adaptability in motorway scenarios
- Expanded the final paper to one conference paper titled *Free-flow tolling system for expressway with fusion of 5G*

communication and high-precision positioning technology and published at the 4th International Conference on Smart City Engineering and Public Transportation (SCEPT2024);

- Published the final results as a patent entitled "A free-flow toll collection method and system for expressways", which is now in the substantive examination stage;

Highway Driving Safety Research Seminar   **Xi'an, China**
Member   12/2022 – 08/2023

In this research, we completed the research seminar and completed the final paper analyzing the driving characteristics of expressway exit area under the condition of rainfall, a control strategy was proposed to provide speed guidance for vehicles leaving the expressway, to reduce road accidents in rainy weather.

- Mentor: Associate Prof. Xiaoyun Chen, Chang'an University.
- Expanded the final paper to one conference paper titled *Lane Level Joint Control of Off-Ramp and Main Line Speed Guidance on Expressway in Rainy Weather* and published at the 103rd Annual Meeting of Transportation Research Board (TRB 2024);
- Responsible for literature search, model building, data collection, and processing, designing speed guidance strategy, giving advice to highway bureau, writing papers in English, etc.

Long-Term and Short-Term Speed Prediction at Tunnel Exits   **Xi'an, China**
Leader   11/2023 –Present

In this study, we establish an optimization algorithm for tunnel exit speed prediction: using driver-style clustering as well as importing environment variables to improve the prediction model accuracy. By conducting experiments on five common deep learning models, the experimental results show that the method possesses a good optimization effect on long-time speed prediction.

- Mentor: Lecturer Wenxuan Wang, Chang'an University.
- Served as the project leader, in charge of supervising the schedule, and took a lot of technical work listed below:
  - Implementing data processing jobs with Python.
  - Deep learning network construction and optimization done using Python.
- Expanded the final paper into a conference paper titled *Incorporating Traffic History Variables in Time-Series Acceleration Prediction Models for Highway Tunnel Exits Using Attention-Enhanced LSTM Networks* and submitted it to the 104th Transportation Research Board Annual Meeting (TRB 2025);

Competitions

- National 1st Prize, The 18th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Works Competition   Oct. 2023
- Honorable Mention, 2024 American Collegiate Mathematical Modeling Contest   Mar. 2024
- Provincial 1st Prize, "Higher Education Society Cup" National Undergraduate Mathematical Contest in Modeling   Nov. 2023
- Provincial 1st Prize, the 1st Shaanxi Provincial College Students Transportation Technology Competition in 2023   Apr. 2023
- Provincial 2nd Prize, the 1st Shaanxi Provincial College Students Transportation Technology Competition in 2023   Apr. 2023
- Provincial 2nd Prize, the 2nd Shaanxi Provincial College Students Transportation Technology Competition in 2024
  (won two awards in total)   Apr. 2024
- Provincial 3nd Prize, the 2nd Shaanxi Provincial College Students Transportation Technology Competition in 2024   Apr. 2024
- University 1st Price, the 13th "Challenge Cup" College Students Extracurricular Academic Science and Technology Works Competition of Chang'an University   Apr. 2023

Scholarships

- National Scholarship   2022-2023 academic year
- Class Academic Merit Scholarship   2022-2023 academic year
- College Contribution Scholarship   2022-2023 academic year
- Course Excellence Scholarship   2022-2023 academic year

Skills

- Software: SPSS, MATLAB, Visio, VISSIM, AutoCAD, Origin.
- Computer skills: Python, familiar with basic machine learning algorithms, and basic data processing skills.
- English Level: CET-4 (531), CET-6 (509), TOEFL (88).