TANG Shiyao

| +86-19923299709 | tangshiyao2024@outlook.com

Education

School of Traffic & Transportation, Beijing Jiaotong University (BJTU) 09/2021-06/2025

Bachelor of Engineering, major in *Traffic and Transportation* GPA: 3.77/4.0, WES GPA: 3.84/4.0

- Core Courses: Calculus (B) Ⅱ (100/100), Introduction to Operations Research (91/100), Big Data Technology Foundation and Application (B) (90/100), Transportation Modelling (93/100), Transportation Economics (95/100), Traffic Engineering (87/100).

- **University of California- Irvine, *Exchange Student*** 03/2024-08/2024

  Cities and Transportation (A) , Freeway Operation and Control (A) Statistical Computing and Exploratory Data Analysis(A+)

  GPA: 4.0/4.0

- **The Hong Kong Polytechnic University, *Exchange Student*** 09/2024-01/2025

  Industrial Engineering Techniques and Methods (A) Planning of Production and Service Systems (A) GPA: 4.0/4.0

Academic and Research Experience

***Core Member,* Thesis project"Mapping Trip Distance Distributions Using Network Embedding and Topological Analysis"** 12/2024-in progress

- Supervised by Prof. Irene Martinez from Delft University of Technology and Prof. Yonglei Jiang from Beijing Jiaotong University
- My research integrates network embedding techniques with topological analysis to map and predict trip distance distributions in urban transportation networks across cities in China and the Netherlands. Using primarily Open Street Map data, I've developed a framework that combines Graph Neural Networks with gravity models to understand how network structure influences travel patterns.

***Core Member,* Project of "Adaptive Test-Time Learning for Driver Fatigue Detection"** 01/2024-02/2025

- Attended this project as an innovation and entrepreneurship training program supervised by Dr. Xinliang Zhou from Nanyang Technological University; proposed a plan for EEG data acquisition and driver fatigue detection that simulates actual driving environments;
- In the context of driver drowsiness recognition based on EEG, used deep learning methods to identify mentality from the EEG signals; learned and understood the original literature, reproduced the code of deep learning;
- Developed an innovative convolutional neural network and combined it with an interpretation technique to process sampling analysis of important features, and further achieve classification;
- Developed Test-Time Adaptation (TTA) for solving critical issues in current cross-driver fatigue detection, designed three DATTF frameworks that contained NTHU-DDD, UTA-RLDDD, and FAHD as public driver fatigue datasets to solve the matched issues that mentioned before;
- Established a subject-specific pattern assessment module that integrated individual characteristics based on similarity metrics, and implemented an adaptive mechanism that dynamically adjusted learning rates based on driver similarities to explore the strategies for overcoming the experimental challenges;
- Introduced Weight and Bias (WandB) to propose experimental tracking, and depended on Matplotlib for data visualization; analyzed the adaptation process and created t-SNE plots for clearly observing the progressive alignment of fatigue patterns among drivers; utilized the final experimental results to testify the feasibility of the applications of the framework in intelligent transportation systems (ITS).
- Submitted to IEEE Transactions on Intelligent Transportation Systems for publication consideration

***Exchange Student*, University of California- Irvine Academic Exchange Program** 03/2024-09/2024

- Attended an academic training program hosted by Beijing Jiaotong University and the University of California-Irvine Division of Continuing Education;
- Followed the college principles of UCI, participated in academic activities, and took courses that would achieve academic credits by both institutes; joined a research project on freight train identification;

- Worked as a research team member in an international project with nearly ten students, studying image visualization and identification of freight trains; extended 1000+ new night vehicle recognition labels, learned processing methods for GIS signals;
- was responsible for the optimization and improvement of night image label recognition models, making image labels collected at night, incorporating new image labels into the model for deep learning, and optimizing model effects and parameters.

***Research Member*, Cambridge University Academic Training Program** 01/2023-03/2023

- Developed a research project on artificial intelligence, which was related to drones and automatic driving technology entitled "Research on Path Planning, Intelligent Navigation and Behavioral Decision Making Algorithms";
- Self-learned Webots stimulative software, collaborated and worked with other team members to complete the final campaign, which was developing a robot emergent delivery system; was responsible for modeling, designing robots, transferring the code into modeling software for robot deployment;
- Established a robots team with different capabilities (shortened the overall service time for urban distribution by 25%) and employed a coordination mechanism to enable these heterogeneous robots to complete transportation tasks while minimizing overall service time (improved task completion efficiency by 40% in a simulated environment);
- Completed a research paper "Review on Short-term Traffic Flow Prediction Methods Under Big Data" as the first author, the paper has been accepted by the International Conference on Mechatronics and Smart Systems.

Internship

***Cloud Control Technology Department Intern,* Western China Internet of Vehicles (Chongqing) Co., Ltd.** 06/2023-08/2023

- Participated in the construction of the Chongqing Intelligent Networked New Energy Vehicle Demonstration Zone Project, as well as site survey, IoV equipment commissioning, arrangement of communication tools, and other matters;
- Assisted in drawing up Vehicle, Road, and Cloud Integration System White Paper 3.0 for the project;
- Collected data on current transportation infrastructure in Chongqing, searched and reviewed relevant research literature both domestically and internationally, and summarized the experiences of other cities in adapting to intelligent connected vehicles;
- Used statistical tools to analyze the collected data; preliminary studied the main challenges faced by intelligent connected vehicles in urban environments;
- Assisted in writing the project progress report, and sorted out all the information on the Internet, as well as the advanced cases and market conditions of the world on vehicle road interconnection.

***Vehicle-Road Coordination Research & Development Intern,* Digital Transportation and Smart City Research Institute, China Merchants Chongqing Communications Technology Research & Design Institute Co., Ltd.** 06/2021-07/2021

- Prepared the implementation plan of the project, read large amounts of literature on international standard and case studies, wrote project proposals and on-site survey reports and submitted them;
- Contributed to the creation of a database compiling over 1,000 relevant international standards and case studies, enhancing the institute's research capabilities.
- Authored 5 compelling project proposals and 3 detailed on-site survey reports, demonstrating strong analytical and writing skills. 2 proposals were selected for further development.
- Presented findings and recommendations to senior management, leading to the approval of a new field simulation in Chongqing for the next phase of the project.

Awards & Honors

- Honor of "Best Diplomatic Presence Award", 2023 "Model APEC" Conference (the unique single award)
- Beijing Municipal Second Prize, "Internet+" Innovation and Entrepreneurship Competition
- School Second Prize, The 2nd Jingcai BJTU College Students' Innovation & Entrepreneurship Competition
- Beijing Municipal Second Prize, "Qingchuang Beijing" Challenge Cup Capital Students' Extracurricular

Academic and Technological Competition

- First Prize, The 13th Innovation & Entrepreneurship Qualification Trials at the Beijing Jiaotong University
- First Prize, The "21st Century Cup" National College English Speaking Competition at the Beijing Jiaotong University (top 5% in Beijing Competition Area)
- First Prize, School Class Scholarship for Academic Excellence (top 1%)
- Second Prize, School Class Scholarship for Academic Excellence (top 3%)
- Second Class Scholarship for Social Practice

Additional Information

- Language Proficiency: Mandarin (native speaker), English (IELTS: 8, GRE:335);
- Skills: Microsoft Office,
  Computer Programming (Python, R, Julia, Matlab),
  Simulation Software (AutoCAD, Vissim, TransModeler, Webots, Civil3D);
  Communication Skills/ Public speaking;
- Hobbies:Guzheng playing, Guqin playing, tennis, volleyball, calligraphy.