# Lanyue Tang

**Research Interest:** Human-Machine Interaction, Artificial Intelligence, Autonomous Vehicle, and Traffic Simulation.

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## EDUCATION

**Tongji University** *Shanghai, China*

*Master of Transportation Planning and Management* *Sep 2021 - present*

- Supervisor: Prof. Jian Sun and Assis. Prof. Lishengsa Yue
- GPA: 4.09/5

**Southeast University** *Nanjing, China*

*Bachelor of Traffic Engineering* *Sep 2017 – Jun 2021*

- GPA: 3.69/4

## PUBLICATION

JOURNAL PUBLICATIONS**:**

**Tang, L.**, Zhang, D., Han, Y., Tian, Y., Yue, L., Sun, J.* (2023), Parallel-Computing-Based Calibration for Microscopic Traffic Simulation Model, Transportation Research Record, Washington, DC.

**Tang, L.**, Yue, L.*, Yuan, J., Sun, J., Fu, A. (2023), CPSOR-GCN: A Vehicle Trajectory Prediction Method Powered by Emotion and Cognitive Theory. **(submitted to Expert Systems with Applications)**

CONFERENCE PUBLICATIONS**:**

**Tang, L.**, Yue, L*, Fu, A. (2023), Interactive Vehicle Trajectory Prediction Considering Abnormal Emotion Based on SOR Cognitive Framework, 2023 7th CAA International Conference on Vehicular Control and Intelligence (CVCI), Oral Presentation.

**Tang, L.**, Han, Y., Zhang, D., Tian, Y., Sun, J.* (2021), Parallel Computing-based Calibration for Microscopic Traffic Simulation Model, Transportation Research Board 101st Annual Meeting (TRB).

Liu, S., Zhang, Q., Wang, P., Feng, B., Huang, C., Zhang, Y., **Tang, L.**, Yue, L., Sun, J. (2023), Enhance SIL Simulation Through Driver Behaviour Modeling at Unprotected Left-turn Scenario for Autonomous Driving SOTIF Analysis, 2023 7th International Conference on Intelligent Traffic and Transportation (ICITT).

Fu, A., Zhang, H., **Tang, L**., Tian, Y. * (2023), Accelerated Verification of Autonomous Driving Systems based on Subset Simulation, Transportation Research Board 103rd Annual Meeting (TRB).

PATENT**:**

**Tang, L.**, Yue, L.*, Yuan, J., Sun, J., Fu, A., A Vehicle Trajectory Prediction Method Considering Driver's Abnormal Emotions. *Chinese Patent*, 2023.

## RESEARCH Projects

**Modeling the influence mechanism of emotions on driving behavior in pre-crash scenarios for ADAS application** *Dec 2022 – Present*

- Proposed a trajectory prediction method that takes into account drivers' abnormal emotions, aiming to solve the problem of false alarms in active safety systems.

- The model takes into account physical motion and cognitive characteristics, and its accuracy is confirmed through building and experimenting with driving simulator environments (based on UE4 and Carla).
- Built a trajectory prediction model (CPSOR-GCN) based on physical GCN, cognitive GCN and LSTM-attention.
- Significantly reduced prediction errors by extracting driver cognitive features, providing an effective means for improving Advanced Driver Assistance System(ADAS).

**Calibration of lane-drop bottleneck micro simulation model accelerated by parallel computing** *Jue 2021 –Jue 2022*

- Developed a microscopic traffic simulation calibration algorithm by applying parallel computing technology, which solved the problems of traditional heuristic algorithms that are time-consuming and inefficient.
- By building a simulation model based on SUMO and parallelizing the genetic algorithm and particle swarm optimization algorithm.
- The calibration time is shortened from 5 hours to less than 1 hour, and the calibration efficiency is increased by 80%.

**Project: Driver Modelling and Scenario Generation – Huawei Technologies Co., Ltd.** *May 2022 – Sep 2023*

*Core member*

- Established a multi-style driver model of left-turn vehicle interaction at the intersection based on the actual collected trajectory data to meet the heterogeneity of drivers in the actual traffic environment.
- Deployed the established driver model in VTD simulation software and provided a test environment that can adjust the heterogeneity of traffic flow for the autonomous driving algorithm.

## HONORS

- "The 3rd Shanghai University Student Traffic and Transportation Science and Technology Competition - Linlong Lighting Cup" *Dec 2023*
- Outstanding Student of the Fifth Yinfu Class *Mar 2023*
- "Zhixing Cup" Shanghai College Student Social Practice Competition, Third Prize *Nov 2022*
- American College Student Mathematical Modeling Competition, Honourable Mention *Mar 2020*
- YunYing Scholarship *Oct 2019*

## SKILLS

- Proficiency with Python and MATLAB.
- Proficient in Carla, Vissim, Sumo, VTD, UE4, and roadRunner.
- Proficiency in PyTorch and TensorFlow possessing a strong grasp of deep learning and machine learning concepts, can address problems such as overfitting and gradient explosion.