Gege Cui

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EDUCATION

Beijing Institute of Technology (BIT) ***Sept 2020 – Jun 2023***
Master of Engineering: *Mechanical Engineering* ***GPA: 3.8 / 4.0***
Relevant Courses: *Mechanical Principles, Modern Sensing and Testing Technology, Microcomputer Principle and Interface Technology, Modern Control Theory*

Beijing Institute of Technology (BIT) ***Sept 2016 – Jun 2020***
Bachelor of Science: *Vehicle Engineering* ***GPA: 3.7 / 4.0***

RESEARCH INTERESTS

- VRU(Vulnerable Road User) Intention Prediction; VRU Risk Assessment; Graph Representation Learning; Graph Convolution Neural Network(GCN); Driving Behavior Model

PROJECT & RESEARCH EXPERIENCE

Research on Cyclist Risk Assessment using Cross Skeleton Interaction based on GCN ***Mar 2022 – Present***
Main Researcher | *Subsidized by National Natural Science Foundation of China & Shanghai Automotive Industry Science and Technology Development Foundation*

- Proposed a framework for risky cyclist identification in shared space with the intelligent vehicle by introducing a cross-skeleton fusion module to explore the interaction between the cyclist and the relative non-motor vehicle; the study found increased efficiency and precision of cyclist risk assessment
- Designed and built an interpretable risk level evaluation module for cyclists by applying data-driven approaches that learn kinematic characteristics as well as interactive features

Personalized Risky Driving Scene Recognition Method using Graph Representation ***Dec 2021 – Present***
Main Researcher | *Subsidized by National Natural Science Foundation of China & Shanghai Automotive Industry Science and Technology Development Foundation*

- Designed a personalized risky driving scene recognition framework that can learn the subjective risk perception tendency of different drivers; realized the dynamic expression of relationships between traffic-condition-related factors in real-time driving scenes; the recognition accuracy is improved by 21.4% than using feature vector representation

Pedestrian Crossing Intention Recognition based on Graph Representation Learning ***Mar 2020 – Present***
Co-Initiator & Researcher | *Subsidized by Science and Technology Innovation Program of Beijing Institute of Technology*

- Created a pedestrian crossing intention recognition framework based on the graph representation learning (GRL) method, improving the intention identification accuracy to 90.29%
- Made use of skeleton information compared to traditional methods using RGB image and optical flow diagram, gaining more insight into the relationship between pedestrian motion and crossing intention

Research on Pedestrian Trajectory and Risk Level Prediction ***Mar 2019 – Present***
Main Researcher | *Subsidized by National Natural Science Foundation of China & Shanghai Automotive Industry Science and Technology Development Foundation*

- Studied the pedestrian data via on-board sensors and verified the interaction information derived from data; employed clustering methods to design a pedestrian risk level prediction model which both decreased dependence on manual poor model generalization and was able to predict risk levels in different time periods and spaces;

PUBLICATIONS

- **G. Cui**, C. Lu*, et al., **Recognition of Cyclist Risky Levels in Shared Space with Intelligent Vehicle: A Graph-based Cross-Skeleton Fusion Method** (working paper, prepare for submission to *IEEE Transactions on Intelligent Transportation Systems, expected completion: Mar. 30th*)
- Z. Zhang, C. Lu*, **G. Cui**, et al., **Prediction of Pedestrian Spatial-Temporal Risky Levels for Intelligent Vehicles: A Data-driven Approach** (under review on *IEEE Transactions on Vehicular Technology, IF=8.089*)
- **G. Cui**, C. Lu*, X. Meng, et al., **Data-Driven Personalized Scenario Risk Map Construction for Intelligent Vehicles**, (accepted on *Automotive Engineering*, in Chinese) *link*
- C. Lu*, **G. Cui**, X. Meng, et al, **Graph Representation Method for Pedestrian Intention Recognition of Intelligent Vehicle** (accepted on *Transactions of Beijing Institute of Technology*, in Chinese)
- C. Lu*, X. Meng, **G. Cui**, et al, **Risk Level Estimating and Modeling of Complex Scenarios for Intelligent**

Vehicles Based on Graph Classification (accepted on *Transactions of Beijing Institute of Technology*, in Chinese)

- X. Hu, G. Xiong, J. Ma, **G. Cui**, et al., **A Non-Uniform Quadtree Map Building Method Including Dead-End Semantics Extraction** (accepted on *Green Energy and Intelligent Transportation*) *link*

PATENTS

- CN Patent 202211023241.9, **G. Cui**, X. Meng, C. Lu*, et al., **"A Fast Prediction Method, System, and Application of Driver's Attention Viewpoint,"** Aug 25, 2022

LEADERSHIP & ACTIVITIES

- The 8th China College Students 'Internet Plus' Innovation and Entrepreneurship Competition (school level), the bronze prize, Group leader (2022)
- Student Team of Scientific Research & Trekking Expedition in Sichuan-Tibet Region, Group leader (2020)
- The 12th Honda China Eco Mileage Challenge, **the 2nd prize** of fuel team, Group leader of the body design group (2018)
- BIT-EPC Racing Team, Vice group leader of body design group (1 year)
- The 6th National College Students Comprehensive Ability Competition for Engineering Training, **the 1st prize**, Group leader (2019)

HONORS & SKILLS

- Second Class Scholarship for Masters, BIT (2021&2022)
- Special Scholarship for Freshmen, BIT (2020)
- Outstanding Student, BIT (2018 & 2019 & 2020 & 2022)
- National Scholarship, Ministry of Education of the People's Republic of China (**top 5%**, 2017)
- **Technologies**: Programming in **Python**. Experience with **MATLAB**, Solidworks, and AutoCAD.
- **Language**: Mandarin (native), English (fluent, IELTS **7.5**)