

# ZHIJIE YI

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## About

I have a background in design and human factors, with extensive experience in experimental design and strong data analysis skills. I specialize in mixed-method research, combining qualitative and quantitative approaches. My current research focuses on monitoring the states of drivers, passengers, and pedestrians and modeling and predicting their behavior using multimodal physiological data, including EEG, eye-tracking, and ECG. Through this, I aim to enhance safety in transportation scenarios.

## Research Interests

- Driver state monitoring and behavior modeling
- Interaction between vulnerable road users and autonomous electric vehicles
- External human-machine interfaces for autonomous vehicles
- Control tower operator interfaces for fleets of autonomous vehicles

## Education

### Beijing Normal University

*Master of design (GPA: 3.6/4.0)*

**09/2022 – 06/2025**

*Beijing, China*

### Hengyang Normal University

*Bachelor of arts*

**09/2015 – 06/2019**

*Hengyang, China*

## Publications

### Journal

- [1] **Zhijie Yi**, Yueteng Yu, Xiang Chang, Xinyu Yang, Mengdi Chu, Junrong Lu, Yiyao Liu, Jingli Qin, Ye Jin, Jialin Song, Guyue Zhou, Jiangtao Gong\*. From Driver to Passenger: Understanding Evaluation Gaps in "Fantastic" Driving Behaviour Delivery. (Submitted to Transportation Research: Part F)
- [2] Xiang Chang\*, **Zhijie Yi\***, Hongling Sheng, Yichang Liu, and Dengbo He. 2025. Multimodal Dataset for Pedestrian-Autonomous Vehicle Interaction Based on On-Road Experiment. (Submitted to Scientific Data)
- [3] Chiju Chao, Yu Chen, Hongfei Wu, Wenxuan Wu, **Zhijie Yi**, Liang Xu, Zhiyong Fu\*. An Emotional Design Model for Future Smart Product Based on Grounded Theory. Systems. 2023; 11(7):377. <https://doi.org/10.3390/systems11070377>

### Conference

- [1] Ye Jin, Ruoxuan Yang, **Zhijie Yi**, Xiaoxi SHEN, Peng Huiling, Xiaolan Liu, Jingli Qin, Li Jiayang, Peizhong Gao, Guyue Zhou, Jiangtao Gong\*. SurrealDriver: Designing LLM-powered Generative Driver Agent Framework based on Human Drivers' Driving-thinking Data[C]//2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2024: 966-971.
- [2] Hongfei Wu, RChiju Chao, **Zhijie Yi**, Zhiyong Fu\*. Improving Knowledge Asymmetry in Group Discussions with Smart Assistants[C]//International Conference on Human-Computer Interaction. Cham: Springer Nature Switzerland, 2024: 138-150.

## Research Experience

### Development of a test for Chinese drivers' risk perception and risk response

**11/2024 – Now**

*The Hong Kong University of Science and Technology(GuangZhou), HIS Lab*

*Supervisor: Prof.Dengbo He*

- Main work: 24 typical traffic risk scenarios are designed in the simulation environment, and a dangerous scenario countermeasure scoring system is established for commercial vehicle drivers for simulation environment training of commercial vehicle drivers.

### Evaluation of heavy truck driver's driving ability under assisted driving

**11/2024 – Now**

*The Hong Kong University of Science and Technology(GuangZhou), HIS Lab*

*Supervisor: Prof.Dengbo He*

- Main work: Smarteye desktop eye tracker, ECG, EDA, RSP and other equipment are used to monitor the status of heavy truck drivers in real road scenes and driving tasks, and to gain a comprehensive understanding of their fatigue level and task load. Based on the data results, the impact of various indicators on fatigue status is modeled.
- Output: A total of eight drivers, more than 180 hours, and more than 13,280 kilometers of real logistics road driving data sets, including drivers' eye movements, electrocardiogram, skin conduction, and breathing data during manual and autonomous driving, as well as the vehicle's own environmental perception data.

### Pedestrian and Autonomous Vehicle Interaction Dataset

**05/2024 – Now**

*The Hong Kong University of Science and Technology(GuangZhou), HIS Lab*

*Supervisor: Prof.Dengbo He*

- Main work: Use eye trackers, EEG, ECG, EDA, RSP and other physiological equipment to collect data on pedestrians' interaction with autonomous vehicles when they cross sidewalks on real roads. Understand pedestrians' observation, decision-making, game-playing and other behavioral patterns.

- Output: A total of 33 pedestrians interacted with self-driving cars at uncontrolled real road intersections for more than 700 minutes. Including EEG, eye movement, ECG, skin conduction, and breathing data.

## Autonomous driving human-computer interaction modeling and design innovation 06/2023 – 01/2024

*Tsinghua University, Institute for AI Industry Research*

*Supervisor: Prof. Jiangtao Gong*

- Background: This study focuses on exploring the gap between driver and passenger perception and driving behavior evaluation from multiple stakeholder perspectives, and provides suggestions and strategies for the design of driving systems in autonomous driving scenarios.
- Main work: Used thematic analysis to code over 90 hours of interview data, Screened more than 217 documents and wrote a review framework, Constructing thesis framework, Deriving interaction models, Write and revised the main content of the paper, Draw all figures for the paper, Video production, The corpus of various driving conditions of 24 drivers was summarized, and the data was cleaned to compile a human driving data set on urban roads.

## Design Futures - Futurescaping generator Research

05/2023 – 11/2023

*Tsinghua University Academy of Fine Arts*

*Supervisor: Prof. Zhiyong Fu*

- Background: As an innovative anticipatory action, the focus of design is turning to a future-oriented perspective. In this direction, it is necessary to analyze culture, images, models and design paradigms to explore how AIGC technology can help people better Design for the future.
- Main work: Use actor network diagrams to visualize more than 40 speculative design cases, Build an AIGC generative design interaction framework, Use chatGPT, midjourney and other tools to simulate the generator prototype, Adjust prompt word parameters and usability testing.

## Research on human-machine empathic interaction of intelligent products

10/2022 – 02/2023

*Tsinghua University Academy of Fine Arts*

*Supervisor: Prof. Zhiyong Fu*

- Background: This study explores whether intelligent assistants can improve the efficiency of group discussions and obtains design suggestions to create more efficient and practical tools for collaborative tasks.
- Main work: Use grounded theory to code user perception corpus of more than 70 smart products, Searched the literature and sorted out more than 20 product emotional models, Use the Wizard of Oz method to organize Organized 4 group experiments workshop. Design scales and questionnaires. Organize validation focus groups.

## Industry Experience

### Applify AI WritingPal

06/2023 – 09/2023

*Intern UX Designer*

*Boston, MA(remote work)*

- Main work: Product interaction design. User interface design. User usability testing

### OPPO

05/2019 – 01/2020

*UX Designer*

*Guangzhou China*

- Main work: User study. Product interaction design. UI interface design. User usability testing.

## Skills

**Quantitative research:** Experimental Design, Questionnaires and Surveys Development

**Qualitative research:** Usability Test, User Interview, Grounded theory, Wizard of Oz Method, Cultural probe

**Languages:** Python, Java, JavaScript, Mandarin(native), English

**Technical Tools:** SAS OnDemand for Academics, Smarteye, EEG (NIC-2), eye tracker (D-LAB), PhysioLAB, GitHub, LaTeX, Figma

## Service

Reviewer of ACM SIGCHI Conference on Human Factors in Computing Systems (CHI2024)

10/2023

Reviewer of ACM SIGCHI Conference on Human Factors in Computing Systems (CHI2025)

10/2024

## Honors & Awards

The 2nd Academic Scholarship For Postgraduate

12/2023

The 3rd Prize, China Creative Challenge Contest

11/2023

The 3rd Prize, Global Service JAM 2023

03/2023