Haitao (Book) Chen

CONTACT INFORMATION

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*Ph.D. student (expected to graduate in Jun 2028) working on human-automation interaction, behavioral data analysis, simulation, and experiment design. Seeking **Summer 2027 research internships**.*

RESEARCH INTERESTS

- **Human–Automation Interaction**: Driving Simulation; Human–Machine Interfaces; Driver Cognition Process
- **Behavioral Modeling & Machine Learning**: Behavioral Prediction; Interpretable Machine Learning
- **Driver Behavioral Interpretation**: Human Decision-Making; Risk Perception; Explainable AI

EDUCATION

Pennsylvania State University, University Park, PA, USA

Ph.D., Industrial and Manufacturing Engineering — Aug 2023 – Jun 2028 (expected)

- Advisor: Dr. Yiqi Zhang
- GPA: 3.70/4.0

Tianjin University, Tianjin, China

B.S., Industrial Engineering (with Honors) — Aug 2018 – Jul 2022

RESEARCH PROJECTS

Human–AV Behavioral Analysis at All-way stop intersections *Lead Researcher*, 2026

- Modeled 2,873 Waymo and Lyft interaction scenarios with XGBoost and SHAP, showing that AVs negotiate right-of-way more defensively than human drivers when their arrival-time advantage is small.

Driver-Initiated Takeover Under Aggression *Lead Researcher*, 2026

- Designed a STISIM simulator study showing that aggression from surrounding vehicles significantly increases drivers' takeover likelihood and makes their vehicle control less stable after takeover.

Mitigating Confusion and Aggression in Mixed Traffic *Lead Researcher*, 2024–2026

- Ran two simulator studies showing that assertive, rule-compliant AV driving styles and V2V communication reduce human drivers' confusion and aggressive driving.

Human-Centered AI for Public Transportation Services *Contributor*, 2026

- Designed a multi-phase survey study of Nashville WeGo bus operators and supervisors (U.S. DOT SMART project) and turned their trust and safety concerns into design recommendations for an AI decision-support system.

Enhancing Situation Awareness under Adversarial Attack in AV *Lead Researcher*, 2025

- Compared 8 AR-HUD takeover interfaces in a simulator study and found that cues highlighting the hazard and the path forward significantly improve driver situation awareness in Level 3 driving under attack.

Technical Skills

- **Driving Simulation**: STISIM (Open Module, Visual Basic), Unity, SUMO
- **Experimental Methods**: Human-subjects study design, IRB protocols, questionnaire design, SAGAT, eye-tracking (Tobii), physiological measures (HRV)
- **Statistical Modeling**: Linear/logistic mixed-effects models, structural equation modeling (SEM), ANOVA
- **Machine Learning**: XGBoost, Random Forest, SHAP, scikit-learn; trajectory analysis of naturalistic driving data (Waymo Open, Lyft Level 5)
- **Languages**: Python, R, Visual Basic, LaTeX

Honors and Awards

- Marcus-Niebel-Schall Graduate Student Scholarship 2026
  (one of five IE Ph.D. students selected department-wide)
- HFES Best Student Paper Finalist ([C1]) 2026
- Harry G. Miller Fellowship in Engineering 2025, 2026
- Penn State Graduate Student International Travel Grant 2025

Publications

Journal Publications

[J1] **Haitao Chen**, Yiqi Zhang. "Mitigating driver confusion and aggression in mixed traffic: Effects of V2V communication and driving style", *Accident Analysis & Prevention*, **236**, 108676, 2026.

[J2] **Haitao Chen**, Zheng Ma, Yiqi Zhang. "Behavioral adaptation in mixed traffic: The roles of AV penetration rate and human driving style", *Accident Analysis & Prevention*, **232**, 108516, 2026.

[J3] **Haitao Chen**, Yiqi Zhang. "Mitigating aggression toward AVs in mixed traffic: Effects of automated driving styles and human driving styles", *Transportation Research Part F: Traffic Psychology and Behaviour*, **116**, 103431, 2026.

Manuscripts In Preparation

[J1] **Haitao Chen**, Yiqi Zhang. "Aggression Toward Automated Vehicles Drives Human Takeover Behavior", *Manuscript in preparation*, 2026.

[J2] **Haitao Chen**, Jiazheng Gao, Aiping Xiong, Yiqi Zhang. "Under Adversarial Attack: Effects of Situation Awareness-Based Augmented Reality HUDs on Driver Situation Awareness in Level 3 Automated Driving Systems", *Manuscript in preparation*, 2026.

[J3] **Haitao Chen**, Zirui Wu, Xianbiao Hu, Yiqi Zhang. "Characterizing Decision-Making Differences Between Automated Vehicles and Human-Driven Vehicles at Unsignalized Intersections", *Manuscript in preparation*, 2026.

Conference Proceedings & Presentations

[C1] **Haitao Chen**, Yiqi Zhang. "When Automated Vehicles Cannot Retaliate: Driver-Initiated Takeover Under Aggression in Mixed Traffic", *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 2026.

[C2] **Haitao Chen**, Jiazheng Gao, Aiping Xiong, Yiqi Zhang. "The Effects of SA-Based Augmented Reality HUDs on Driver Situation Awareness in Level 3 ADS Under Adversarial Attack", *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 2026.

[C3] **Haitao Chen**, Yiqi Zhang. "Mitigating Driver Confusion and Aggressive Driving Behavior in Mixed Traffic Using V2V Communication", *Transportation Research Board (TRB) Annual Meeting*, 2026. (**Peer-Reviewed Conference Presentation**)

[C4] **Haitao Chen**, Yiqi Zhang. "Mitigating Aggressive Driving in Mixed Traffic: The Role of Driving Styles of Automated Vehicles and Human-Driven Vehicles", *Transportation Research Board (TRB) Annual Meeting*, 2025. (**Peer-Reviewed Conference Presentation**)

PROFESSIONAL SERVICES

Peer Review Service:

- Scientific Reports
- Cognition, Technology & Work
- Transportation Research Part F: Traffic Psychology and Behaviour
- IEEE Transactions on Haptics
- IEEE Transactions on Intelligent Transportation Systems
- Advanced Engineering Informatics
- ACM International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI)
- Proceedings of the Human Factors and Ergonomics Society Annual Meeting

Professional Affiliations:

- Transportation Research Board (TRB), Member, 2024–Present
- Human Factors and Ergonomics Society (HFES), Member, 2023–Present

TEACHING AND MENTORING

Instructor:

- **IE 327: Introduction to Work Design** Fall 2026

Teaching Assistant:

- **IE 327: Introduction to Work Design** Spring 2024, Spring 2025, Fall 2025

Undergraduate Research Mentorship:

- **Xinlu Huang**, Enhancing Situation Awareness of Adversarial Machine Learning in Human–AI Collaboration, 2025–2026.
- **Alexander Maldonado**, Enhancing Situation Awareness of Adversarial Attacks in Human–AI Collaboration, 2025–2026.
- **Samir Jacobo Ramos**, Effects of HMI Design on Human–AV Interaction in Mixed Traffic, Jan. 2025–2026.
- **Connor Legge**, Effects of Automated Driving Styles on Driver Decision-Making in Mixed Traffic, Jan.–May 2024.
- **Xinyi Zhou**, Effects of Automated Driving Styles on Driver Decision-Making in Mixed Traffic, Jan.–May 2024.

(Last updated: Nov 2026)