XINGJIAN MA

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Department of Industrial and System Engineering
University of Wisconsin-Madison
Madison, WI, USA

SUMMARY

Second-year Human Factors Ph.D. student with a background in Electrical and Computer Engineering and two years of experience in human-automation research. Skilled in quantitative analysis and modeling with human factors and behavioral/performance metrics.

EDUCATION BACKGROUND

University of Wisconsin-Madison — Madison, WI, US
Doctor of Philosophy, Industrial and System Engineering | GPA: 3.83/4.00 — *Aug. 2023 – Present*

University of Florida — Gainesville, FL, US
Master of Science, Electrical and Computer Engineering | GPA: 3.83/4.00 — *Aug. 2021 – May 2023*

Xidian University — Xi'an, Shaanxi, CN
Bachelor of Engineering, Electronic and Information Engineering | GPA: 3.40/4.00 — *Aug. 2016 – July 2020*

EXPERIENCE

RESEARCH ASSISTANT — University of Wisconsin-Madison
Aug. 2023 – Present

Latency Effects in Highly Automated Trucking — *Sep. 2024 – Present*

- Designed a driving simulation study, recruited participants and conducted human-subject experiments. Examined the impact of latency in remote driving on driver workload, trust, and performance.
- Collected and cleaned driver's self-assessment and input data. Analyzed and modeled variable correlations with latency and breakpoints using statistical analysis and machine learning.

Dynamic Trust and Reliance in Conditional Driving Automation — *Aug. 2023 – Present*

- Designed a driving simulation study to examine how risk level and transparency influence trust calibration (Study 2).
- Utilized modeling techniques to evaluate feature importance and predict reliance behavior based on human factors variables (Study 1).

GRADUATE STUDENT RESEARCH ASSISTANT — University of Florida
June. 2022 – Aug. 2023

Understanding Visual Scanning Behavior in Driving — *Jan. 2023 – Aug. 2023*

- Developed a statistical pattern-based method to extract distinct visual scanning patterns from time-series eye-tracking data. Compared and classified driver gaze movements, enabling automated identification of recurring visual attention behaviors.

Parkinson's Disease and Driving automation — *June. 2022 – Mar. 2023*

- Applied machine learning and computer vision to built event detection models to evaluate driver behavior in automated driving scenarios.
- Implemented vision-based solutions for lane safety monitoring by developing algorithms to detect lane deviations.

PRODUCT MANAGER INTERN — ByteDance Ltd.
Dec. 2020 – May 2021

- Conducted user interviews and surveys with streamers to identify needs, designed 4 software prototypes tailored to segmented user groups and validated functionality through iterative evaluations.
- Coordinated cross-functional teams to align prototypes with feature roadmaps, and executed delivery.

UNDERGRADUATE RESEARCH ASSISTANT Xidian University

June 2019 – Aug. 2019

- Designed experiment based on human anatomy to collect EMG signals from different parts of muscles under different hand gestures.
- Applied signal processing and machine learning techniques to filter noise, segment data, and model patterns for analysis and prediction.

PUBLICATIONS

Peer-Reviewed Journal Papers

1. Xiao, X., **Ma, X.**, McDonald, A. D., & Mehta, R. (2025). What leads to reliance on automated vehicles? An inferential analysis of responses to variable AV performance. *Applied Ergonomics*.

Peer-Reviewed Conference Proceeding Papers

1. Zhang, Y., **Ma, X.**, Mehta, R., & McDonald, A. D. (2025). Explaining trust and proactive takeovers in automated driving: A machine learning analysis with neural and gaze metrics. *Human Factors and Ergonomics Society Annual Meeting*.
2. **Ma, X.**, Zakarian, V., & McDonald, A. D. (2024). Understanding the Workload of Remote Truck Operators with Discrete Event Simulation. [Presentation]. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 68(1), 947-948.
3. **Ma, X.**, Xiao, X., Mehta, R., & McDonald, A. D. (2024). Understanding Reliance Decisions in Automated Vehicles Using Random Forest Analysis. [Presentation]. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 68(1), 910-911.

Presentations & Posters

1. **Ma, X.**, & McDonald, A. D. (2025). The human side of remote truck driving: Latency effects on workload, trust, and driving performance. [Poster]. 2025 Safe Mobility Conference (SMC), Madison, WI, Apr. 2025.
2. Liu, P., Chen, H, **Ma, X.**, & Yu, D. (2025). Large Language Models for surgical simulation and education. [Poster]. ACS Surgeons and Engineers, Chicago, IL, Mar. 2025.
3. **Ma, X.**, Kim, M., Zheng, H., & Giang, W. C. W. (2024). Understanding visual scanning behavior in driving: A review and a new perspective using statistical pattern-based approach. [Poster]. Transportation Research Board (TRB) Annual Meeting, Washington, DC, Jan. 2024.

Under Review

NOTABLE COURSES

Human Factors: Human-Computer Interaction, Human-AI Teaming, Human Factors of Data Science and Machine Learning, Occupational Ergonomics and Biomechanics, Human Performance and Accident Causation, Human Factors in System Design

Statistics and Computer Science: Applied Bayesian Statistics, Design and Analysis of Psychological Experiments, Interactive Data Analytics, Applied Probability Methods in Engineering, Fundamentals of Machine Learning

SKILLS

Programming Languages: R, Python, MySQL, LaTeX.

Data Collection Tools: EEG, EMG, fNIRS, ECG, Eye-tracking, Driving simulator

Software Tools: Axure, Figma, Unity, PsychoPy

Professional Expertise: Human subject experiment design, Driving simulation experiment design, Survey design and distribution, Data collection, Data cleaning, Data visualization, Quantitative and qualitative data analysis, Project management.

SERVICE

HFES Annual Meeting Reviewer *2025*

IEEE Transactions on Human-Machine Systems Reviewer *2025*

University of Wisconsin-Madison HFES Student Chapter Board Member *2023–2025*