Meng Wang

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RESEARCH INTERESTS   Human-Computer Interaction, Machine Learning / Artificial Intelligence, Human Factors

EDUCATION

University of Massachusetts Amherst, Amherst, MA   **Aug. 2021 - Expected Dec 2024**

Ph.D. in Industrial Engineering and Operations Research

- Committee: Shannon Roberts (advisor), Pnina Gershon, David Jensen, Muge Capan

Worcester Polytechnic Institute, Worcester, MA   **Aug. 2016 - May 2018**

M.S. in Data Science - GPA: 3.82/4.0

EXPERIENCE

UMass Amherst, Amherst, MA   **Aug. 2021 - Present**

Graduate Research Assistant

- Applied Vision Transformer models to roadway scene image analysis, investigating the use of Large Language Models (LLMs) to extract contextual features and assess drivers' cognitive load.
- Investigated the relationship between roadway scene images, drivers' workload, and crash likelihood with Deep Learning models.
- Developed and implemented user studies to assess drivers' behavior in interaction with human-machine interfaces and usage of automated vehicles.

Honda Research Institute, San Jose, CA   **Jan. 2024 - May 2024**

Research Intern

- Implemented Vision Transformer models and machine learning algorithms on multi-modal datasets to evaluate drivers' well-being and prosocial behavior.
- Conducted prompt engineering with Large Language Models (LLMs) to enhance the understanding and modeling of prosocial behaviors in drivers.
- Developed a web-based annotation tool to streamline the driver behavior annotation process.

AAA Foundation for Traffic Safety, Washington DC   **May 2022 - Aug. 2022**

Research Intern

- Developed and applied seasonal time series models to quantify the impact of the COVID-19 pandemic on fatal crash rates.
- Employed computer vision models, including panoptic segmentation, on street view imagery to construct a road complexity index.

MIT AgeLab, Cambridge, MA   **Mar. 2020 - Jul. 2021**

Machine Learning Engineer

- Leveraged computer vision and machine learning algorithms to model and analyze drivers' cognitive load, contributing to advancements in driver state monitoring.
- Integrated AWS deployment systems into facial analysis pipelines, significantly enhancing annotation speed and predictive accuracy for driver monitoring systems.

AdaViv (MIT DesignX startup), Cambridge, MA   **Aug. 2018 - Mar. 2020**

Research Scientist

- Developed and trained computer vision models for plant bud detection and implemented unsupervised anomaly detection algorithms to identify plant health issues.
- Engineered an AWS deployment system for automated data retrieval, preprocessing, model training, and result dissemination using SageMaker.
- Led quality control initiatives by designing operational dashboards to monitor data collection and annotation processes.

SELECTED PUBLICATIONS	**Wang, M.**, Wong, N., Mehrotra, S., Roberts, S. C., Kim, W., Romo, A., & Horrey, W. J. (2024). "The effect of human-machine interface modality, specificity, and timing on driver performance and behavior while using vehicle automation." *Accident Analysis & Prevention*, 203, 107606.

Wang, M., Zhang, F., & Roberts, S. C. (2024). "A simulator study assessing the effectiveness of training and warning systems on drivers' response performance to vehicle cyberattacks." *Accident Analysis & Prevention*, 203, 107644.

Wang, M., Mehrotra, S., Wong, N., Parker, J., Roberts, S.C., Kim, W., Romo, A. & Horrey, W.J. (2024). "Human-Machine Interfaces and Vehicle Automation: A Review of the Literature and Recommendations for System Design, Feedback, and Alerts." *Transportation Research Part F: Traffic Psychology and Behaviour*.

Wang, M., Ojuri, B., Roberts, S. C., McDermott, J., & Fisher, D. L. (2023). "Impact of level 2 automation and ADHD symptomatology on young drivers' attention maintenance." *Transportation research part F: traffic psychology and behavior*, 94, 504-516.

Ding, L., Terwilliger, J., Parab, A., **Wang, M.**, Fridman, L., Mehler, B., & Reimer, B. (2023). "CLERA: A Unified Model for Joint Cognitive Load and Eye Region Analysis in the Wild." *ACM Transactions on Computer-Human Interaction*.

Ding, L., Glazer, M., **Wang, M.**, Mehler, B., Reimer, B., & Fridman, L. (2020, October). Mit-avt clustered driving scene dataset: Evaluating perception systems in real-world naturalistic driving scenarios. In *2020 IEEE Intelligent Vehicles Symposium (IV)* (pp. 232-237). IEEE. (selected for oral presentation)

[Under Review] **Wang, M.**, Mehrotra, S., Roberts, S.C., "Analyzing Driver Characteristics and Takeover Behaviors in L2 Automated Vehicles Using Vehicle Kinematic Data and Clustering Algorithms." *Transportation Research Record*, submitted in July 2024.

[Under Review] **Wang, M.***, Paari M.*, Hungund, A., Pamarthi, J., Roberts, S., & Pradhan, A. K., "Investigating training program interactions that predict hazard anticipation skills for novice teen drivers." *Transportation Research Record*, submitted in July 2024.

SERVICES	Conference Reviewer for AutoUI, TRB, HFES.
	Co-chair for the Surface Transportation Technical Group sessions in HFES 2022.
	Teaching Assistant for Human Factors Engineering, 2022.
	Teaching Assistant for Information Retrieval and Social Media, 2018.

HONORS AND AWARDS	Lifesavers Conference Traffic Safety Scholarship, 2023.
	UMass College of Engineering Doctoral Fellowship for Outstanding Students 2022.
	Winner of the Data Science Graduate Qualifying Project for WPI Graduate Research 2018.

MISC.	Programming: Python (Pandas, Sklearn, Tensorflow, Keras, Plotly), R, SQL, LaTeX, Matlab, SAS
	Software: Tableau, Weka, SPSS
	Platforms/Tools: AWS SageMaker, Docker, Linux, GIT