

# Meng Wang

---

## CONTACT INFORMATION

Amherst, MA 01002 USA

*E-mail:* mwang0@umass.edu

## RESEARCH INTERESTS

Driving Behavior, Human Factors, Machine Learning, Computer Vision, Statistical Modeling

## EDUCATION

**University of Massachusetts Amherst**, Amherst, MA

**Aug. 2021 - Present**

*Ph.D. in Industrial Engineering*

- Supervisor: Dr. Shannon Roberts
- Overall GPA: 4.0/4.0

**Worcester Polytechnic Institute**, Worcester, MA

**Aug. 2016 - May 2018**

*M.S. in Data Science*

- Overall GPA: 3.82/4.0
- Core courses: Machine Learning, Data Mining, Deep Learning, Database Management

**Central University of Finance and Economics**, Beijing, China

**Sep. 2012 - June 2016**

*B.S. in Statistics*

- Overall GPA: 88.0/100
- Major GPA: 90.6/100
- Core courses: Mathematical Analysis, Advanced Algebra, Probability, Mathematical Statistics

**University of Nottingham**, Nottingham, UK

**Jan. 2015 - June 2015**

*Statistics (Exchange student) - Grade: A*

- Related courses: Time Series Analysis, Experimental Design, Graph Theory

## EXPERIENCE

**AAA Foundation for Traffic Safety**, DC

**May 2022 - Aug. 2022**

*Research Intern*

- Built seasonal time series models to analyze and quantify the effect of the COVID-19 pandemic on the fatal crashes and related features;
- Explored and applied the computer vision (panoptic segmentation) models on the street view images and defined the road complexity index using the output from the algorithm.

**MIT AgeLab**, Cambridge, MA

**Mar. 2020 - Jul. 2021**

*Machine Learning Engineer*

- Used computer vision and machine learning algorithms to analyze driver's cognitive load;
- Incorporated AWS services to driver's facial analysis pipeline to improve the annotation speed and prediction efficiency.

**AdaViv (MIT DeltaV startup)**, Cambridge, MA

**Aug. 2018 - Mar. 2020**

*Research Scientist*

- Trained computer vision object detection model to detect the buds region in the plants, and developed unsupervised anomaly detection model to detect anomalies on the plants;
- Built an AWS-based model deployment system that can automatically fetch data from S3 pre-process and train data in SageMaker and send predictions to the website;
- Responsible for data quality control, built operational dashboards that can monitor the image quality of data collection sessions and annotation quality of data annotation progress.

**Pfizer Inc.**, Groton, CT

**Jan. 2018 - May 2018**

*Data Analysis Intern*

- Conducted correlation analysis to find important factors that had an impact on the medicine waste ratio, and these substantial factors had a Pearson's Correlation Coefficient from 0.5 to 0.7 and a mutual information score from 0.7 to 0.9;
- Used Neural Networks to predict waste ratio to see which neurons were activated, compared these neurons with the factors found from correlation analysis;
- Built dashboards to help Pfizer monitor those influential features and adjust the dispensing plan accordingly.

**Tencent**, Beijing, China

**Feb. 2016 - Jun. 2016**

*Data Engineer Intern*

- Assisted Financial Branch in managing data from various sources;
- Conducted exploratory data analysis and data visualization to help team members better understand the data.

JOURNAL  
PUBLICATIONS

**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*.

Zhang, F., **Wang, M.**, Parker, J. I., & Roberts, S. C. (2023). "The effect of driving style on responses to unexpected vehicle cyberattacks." *Safety*, 9(1), 5.

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)

CONFERENCE  
PUBLICATIONS

Pamarthi, J., Hungund, A., **Wang, M.**, Sayer, T., Roberts, S. C., & Pradhan, A. "Risk-ATTEND (Risk Anticipation Training to Enhance Novice Driving): Pilot Evaluation of a Risk Anticipation Training Program for Teen Drivers" In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting (2023)*.

Parker, J. I., Zhang, F., **Wang, M.**, & Roberts, S. C. (2022, September). "How do drivers respond to vehicle cyberattacks? A driving simulator study." In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 66, No. 1, pp. 737-741). Sage CA: Los Angeles, CA: SAGE Publications.

**Wang, M.** and Tefft, B., "Comparing Fatal Crashes in the United States During the COVID-19 Pandemic to Forecasts Based on Pre-Existing Trends." In *2023 Transportation Research Board Annual Meeting*.

RESEARCH  
REPORTS

**Wang, M.**, Jah'inaya Parker, N. W., Mehrotra, S., Roberts, S. C., Kim, W., Romo, A., & Horrey, W. J. (2023). "Human-Machine Interfaces and Vehicle Automation: The Effect of HMI Design on Driver Performance and Behavior." (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.

Mehrotra, S., **Wang, M.**, Wong, N., Parker, J., Roberts, S.C., Kim, W., Romo, A. & Horrey, W.J. (2022). “Human-Machine Interfaces and Vehicle Automation: A Review of the Literature and Recommendations for System Design, Feedback, and Alerts” (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.

Tefft, B.C. & **Wang, M.** (2022). “Traffic Safety Impact of the COVID-19 Pandemic: Fatal Crashes Relative to Pre-Pandemic Trends, United States, May–December 2020” (Research Brief). Washington, D.C.: AAA Foundation for Traffic Safety.

## PROJECTS

### **Complexity Level Identification of Roadway Scenes**

**Jan 2023 - Current**

*PhD dissertation project at UMass*

- Initial work stemmed from internship at AAA Foundation of Traffic Safety.
- Incorporate the computer vision models to identify the objects on the roadway scene images and define a road complexity index to quantify;
- Use machine learning models to investigate if there is a relationship between driving behavior and road complexity index.

### **Driver’s Cognitive Load Analysis**

**May 2020 - Jun. 2021**

*Machine Learning project at MIT*

- Introduced individualized normalization to the driver’s cognitive load analysis and improve the classification accuracy to 95%, paper has been submitted to CHI 2020;
- Used Markov chain Monte Carlo to get the parameter set of which the buffer scores have the most significant associations with driver’s cognitive load, and such parameter set achieved a precision and recall score of 0.8 and 0.8.

## SERVICES

Conference Reviewer for HFES 2023 Surface Transportation track.

Co-chair for the STTG sessions in HFES 2022.

Conference Reviewer for AutoUI 2020.

**Teaching Assistant**, University of Massachusetts, Amherst

**Fall 2022**

MIE657 - Human Factors Design Engineering

**Teaching Assistant**, Worcester Polytechnic Institute

**Spring 2018**

DS595 - Special topics: Information Retrieval & Social Media

## HONORS AND AWARDS

UMass College of Engineering Doctoral Fellowship for Outstanding Students, Amherst, MA **2022**.

1st Place, Research Innovation Exchange competition (GRIE) 2018 in Data Science GQP category (Among 10 teams), Worcester, MA **2016**

Excellent Community President Prize, Beijing, China **2014**

The Soong Ching Ling Scholarship for Outstanding High School Students, Guangzhou, China **2012**

## MISC.

Programming: Python (Pandas, Sklearn, Tensorflow, Keras, Plotly), R, SQL, LaTeX, Matlab, SAS  
Software: Tableau, Weka, SPSS

Platforms/Tools: Amazon SageMaker, Docker, Linux, GIT

Languages: Native in Chinese, fluent in English