YUNSHENG MA

201-626-8236 | yunsheng@purdue.edu | linkedin.com/in/yunsheng-ma | maysonma.github.io

EDUCATION

Purdue University West Lafayette, IN
Ph.D., Research Field: Autonomous Driving, Transportation Engineering Jan. 2023 – Present

New York University New York, NY
Master of Science, Computer Science Sep. 2020 – May 2022

Harbin Institute of Technology Weihai, China
Bachelor of Engineering, Computer Software Engineering Sep. 2016 – May 2020

University of California, Berkeley Berkeley, CA
Visiting Students, Electrical Engineering and Computer Sciences Aug. 2018 – May 2019

PUBLICATIONS

Papers Under Review (*denotes co-first authors)

Y. Ma, R. Du, A. Abdelraouf, K. Han, R. Gupta, and Z. Wang. "Driver Digital Twin for Online Recognition of Distracted Driving Behaviors." 2023

C. Cui*, **Y., Ma***, X. Cao, W. Ye, Z. Wang. "Receive, Reason, and React: Drive as You Say with Large Language Models in Autonomous Vehicles." 2023

In Conference Proceedings (*denotes co-first authors)

Y. Ma*, J. Lu*, C. Cui, S. Zhao, X. Cao, W. Ye, Z. Wang. "MACP: Efficient Model Adaptation for Cooperative Perception." In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision* (**WACV**), 2024.

Y. Ma, W. Ye, X. Cao, A. Abdelraouf, K. Han, R. Gupta, Z. Wang. "CEMFormer: Learning to Predict Driver Intentions from In-Cabin and External Cameras via Spatial-Temporal Transformers." *IEEE 26th International Conference on Intelligent Transportation Systems* (**ITSC**), 2023.

C. Cui, **Y. Ma**, J. Lu, Z. Wang. "Radar Enlighten the Dark: Enhancing Low-Visibility Perception for Automated Vehicles with Camera-Radar Fusion." *IEEE 26th International Conference on Intelligent Transportation Systems* (**ITSC**), 2023.

Y. Ma, L. Yuan, A. Abdelraouf, K. Han, R. Gupta, Z. Li, Z. Wang. "M^{2}DAR: Multi-View Multi-Scale Driver Action Recognition With Vision Transformer." In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2023.

L. Yuan, **Y. Ma**, L. Su, Z. Wang. "Peer-to-Peer Federated Continual Learning for Naturalistic Driving Action Recognition." In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2023.

W. Ye, **Y. Ma**, X. Cao, K. Tang. "Mitigating Transformer Overconfidence via Lipschitz Regularization." In *Proceedings of the Thirty-Ninth Conference on Uncertainty in Artificial Intelligence* (**UAI**), 2023.

S. Zhao*, **Y. Ma***, Y. Gu, J. Yang, T. Xing, P. Xu, R. Hu, H. Chai, and K. Keutzer. "An End-to-End Visual-Audio Attention Network for Emotion Recognition in User-Generated Videos." In *Proceedings of the AAAI Conference on Artificial Intelligence* (**AAAI**), 2020, **Oral Presentation**.

Workshop Presentations (*denotes co-first authors)

W. Ye*, **Y. Ma***, Xu Cao."Uncertainty Estimation in Deterministic Vision Transformer." AAAI Workshop on Uncertainty Reasoning and Quantification in Decision Making (**UDM-AAAI**), 2023.

Y. Ma, Z. Wang. "ViT-DD: Multi-Task Vision Transformer for Semi-Supervised Driver Distraction Detection." NeurIPS Workshop on Machine Learning for Autonomous Driving (**NeurIPS ML4AD**), 2022.

WORK EXPERIENCE

Digital Twin Lab, Purdue University   Aug. 2022 – Present
Research Assistant   Advised by Dr. Ziran Wang

> **Foundation Models for Autonomous Driving:** Proposed a new perspective for improving decision-making and enabling human-like interaction in autonomous vehicles by leveraging Large Language Models.
>
> **BEV Perception:** Proposed a novel MACP framework to enable a single-agent pre-trained model with cooperation capabilities. It achieves SOTA performance in both simulation and real-world cooperative perception benchmarks, with fewer tunable parameters and reduced communication cost. Works have been published in **ITSC**.
>
> **Driver Digital Twin:** Proposed novel multi-view spatial-temporal Transformers for driver intention prediction, driver action recognition, and temporal action localization. Works have been published in **CVPRW** and **ITSC**.

Didi Chuxing   June 2019 – Sep. 2019
Research Engineer Intern   Advised by Dr. Pengfei Xu

> **Video Emotion Recognition:** Proposed a Visual-Audio Attention Network (VAANet) that integrates spatial, channel-wise, and temporal attentions into a 3D convolutional neural network. It achieved SOTA performance on both the VideoEmotion-8 and Ekman-6 datasets. Work published at **AAAI**.

TEACHING EXPERIENCE

NYU CSCI-GA.3033 Design and Analysis of Algorithms   Spring 2021
Teaching Assistant   Instructor: Prof. Manuel Charlemagne

PROFESSIONAL ACTIVITIES

As a Workshop/Challenge Organizer

Co-Chair of *WACV 2024 Workshop on Large Language and Vision Models for Autonomous Driving* (**LLVM-AD**), Waikoloa, Hawaii.

Co-Organizer of the **MAPLM** Challenge: *A Large-Scale Vision-Language Benchmark for Map and Traffic Scene Understanding*.

As a Reviewer

Reviewer of *IEEE Internet of Things Journal* (**IoT-J**)

Reviewer of *IEEE Transactions on Intelligent Vehicles* (**T-IV**)

Reviewer of *Workshop on Large Language and Vision Models for Autonomous Driving* (**LLVM-AD**)   2024

Reviewer of *International Conference on Intelligent Transportation Systems* (**ITSC**)   2023

Reviewer of *ACM/IEEE International Conference on Cyber-Physical Systems* (**ICCPS**)   2023

Reviewer of *IEEE International Conference on Mobility: Operations, Services, and Technologies* (**MOST**)   2023

Reviewer of *International Conference on Machine Learning* (**ICML**)   2022

As a Volunteer

Volunteer of *Conference on Uncertainty in Artificial Intelligence* (**UAI**)   2023

Volunteer of *AAAI Conference on Artificial Intelligence* (**AAAI**)   2023

Assistant Moderator of *TRB Conference on Innovations in Travel Analysis and Planning*   2023

Webmaster of *IEEE Technical Committee on Internet of Things in Intelligent Transportation System*   2022 – Present

FELLOWSHIPS & AWARDS

Conference on Next-Generation Transportation Systems, *Outstanding Speaker Award*   2023

AAAI Student Scholarship Grant   2023

NeurIPS ML4AD Travel Grant, sponsored by *Waymo*   2022

TECHNICAL SKILLS

Programming: Python, C/C++

Packages: PyTorch/Tensorflow, Lightening, Hugging-Face, LangChain, OpenAI-Gym, OpenCV

Tools: Git, LaTeX, SQL