

Jinghui Yuan

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CURRICULUM VITAE HIGHLIGHTS

- **Current Position:** R&D Staff Member, Applied Research for Mobility Systems (ARMS) Group, Oak Ridge National Laboratory (ORNL).
- **Research Focus:** AI-enabled transportation; CAV/ADS/ADAS safety and energy evaluation; VIL/XIL testing and real-time co-simulation; high-fidelity digital twins; distributed AI signal control, vehicle-signal coordination, and eco-driving; trustworthy reinforcement learning, CAV cybersecurity, and agentic/LLM scenario generation.
- **Research Leadership and Funding:** PI/Co-PI for \$15M+ in DOE, NHTSA, and UT-ORII projects spanning integrated control, XIL safety evaluation, digital twins, distributed AI signal control, trustworthy RL, cybersecurity, and standardized CAV energy/emissions testing.
- **Scholarly Output, Innovation, and Recognition:** 41 peer-reviewed journal articles; one book chapter; 3,700+ citations (h-index 29); nine invited talks; lead-author *Nature Communications* paper conditionally accepted; papers in press at *Accident Analysis & Prevention* and *IEEE T-ITS*; multiple granted U.S. patents; DOE *Real-Twin* software; 2026 BTSD Early Career Award; 2026 R&D 100 Award.
- **Deployment and Agency Engagement:** Led or supported real-world deployments and evaluations in Chattanooga, Hawaii, and Nashville; partnered with government, academia, and industry; translated research into demonstrations, deployable software, and operational outcomes.
- **Teaching and Mentorship:** Guest lecturer in ITS, CAVs, and AI in transportation; mentor to graduate students and interns, including 2026 DOE SULI intern focusing on vision-language-model research.
- **Professional Leadership and Service:** Associate Editor, *IEEE Transactions on Intelligent Vehicles* and *IEEE Open Journal of Intelligent Transportation Systems*; IEEE Senior Member; advisory panel member for the REPS U.S.DOT UTC and TRB BTSCRP; conference organizer/session chair; reviewer for *Nature Communications* and leading transportation/AI journals.

ACADEMIC AND PROFESSIONAL APPOINTMENTS

Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA

- R&D Staff Apr 2024 – Present
- R&D Associate Staff Feb 2022 – Mar 2024
- Postdoctoral Research Associate Jun 2021 – Jan 2022

University of Central Florida, Orlando, Florida, USA

- Postdoctoral Research Scholar Aug 2019 – May 2021
- Graduate Research Assistant Aug 2016 – Aug 2019

Tongji University, Shanghai, China

- Graduate Research Assistant Aug 2013 – Jul 2016

EDUCATION

University of Central Florida, Orlando, Florida, USA

- Ph.D. in Civil Engineering (Transportation) Aug 2016 – Aug 2019
 - Dissertation: Arterial-Level Real-Time Safety Evaluation in The Context of Proactive Traffic Management
 - Advisor: Prof. Mohamed Abdel-Aty
 - Focus: Real-time crash risk prediction, intelligent transportation system, big data analytics, deep learning.

Tongji University, Shanghai, China

- M.Eng. in Transportation Planning and Management Sep 2013 – Jun 2016
 - Thesis: Traffic Safety Oriented Research on the Planning and Management of Suburban Arterials
 - Advisor: Prof. Xuesong Wang

Central South University, Changsha, Hunan, China

- B.Eng. in Civil Engineering Sep 2009 – Jul 2013
 - Advisor: Prof. Limin Peng

RESEARCH INTERESTS

- Safe, Efficient, and Sustainable Connected and Automated Vehicles
- Artificial Intelligence in Intelligent Transportation Systems

- Vehicle-in-the-Loop Testing and Advanced Driver Assistance Systems (ADAS)
- Traffic Safety, Real-Time Crash Risk Prediction and Evaluation
- High-Fidelity Digital-Twin and Driving Simulator

RESEARCH PROJECTS

OAK RIDGE NATIONAL LABORATORY

- [14] **(Principal Investigator)** SAVED: Scenario-Based Assessment and Validation of Energy Impacts of Cooperative Driving Automation for Heavy-Duty Vehicles (\$4,500,000)
U.S. Department of Energy. Aug 2026 – Present
- [13] **(Principal Investigator)** Eco-Corridor: Scalable Deployment of Integrated Eco-Driving and Multi-Modal Signal Priority for Connected Transit and Freight on Urban Corridors (\$2,400,000)
U.S. Department of Energy. Aug 2026 – Present
- [12] **(Co-Principal Investigator)** Multi-Agent AI System for Resilient and Energy Efficient Regional Transportation Operations (\$2,500,000)
U.S. Department of Energy. Aug 2026 – Present
- [11] **(Co-Principal Investigator)** DASiC-NEXT: Assured Human-AI Collaboration for Resilient and Trustworthy Traffic Signal Operations (\$1,000,000)
U.S. Department of Energy. Aug 2026 – Present
- [10] **(Co-Principal Investigator)** Characterizing and Evaluating Crash Avoidance and Driving Automation Technologies Through X-in-the-Loop Testing (\$950,000)
National Highway Traffic Safety Administration, NHTSA. Jan 2024 – Present
- [9] **(ORNL Principal Investigator)** Towards Trustworthy Reinforcement Learning for Responsible Intelligent Transportation Systems (\$200,000)
The University of Tennessee-Oak Ridge Innovation Institute (UT-ORII). Sep 2024 – Present
- [8] **(Principal Investigator)** SMART Mobility 2.0: Integrated Control of Vehicle Speeds and Traffic Signals for Reducing Congestion and Energy Use (\$3,150,000)
U.S. Department of Energy. Jun 2022 – Sep 2024
- [7] **(ORNL Principal Investigator)** Enhancing the Security of Connected and Automated Vehicles Ecosystem (\$200,000)
The University of Tennessee-Oak Ridge Innovation Institute (UT-ORII). Sep 2022 – Sep 2024
- [6] **(Senior Researcher)** Real-Twin (1.0 and 2.0): A Unified Scenario Generation Capability for Mobility Research (\$4,000,000)
U.S. Department of Energy. Mar 2022 – Present
- [5] **(Tech Lead)** Real-Twin/Real-Sim Deployment: High-Fidelity 3D Digital Twin Scenario Library Generation for Energy-Efficient Mobility Systems (\$4,500,000)
U.S. Department of Energy. Jun 2024 – Present
- [4] **(Tech Lead)** Distributed Artificial-Intelligence (AI)-based Signal Control (DASiC) (\$1,500,000)
U.S. Department of Energy. Oct 2024 – Present
- [3] **(Senior Researcher)** Development of Standardized Test Procedures for Connected and Automated Vehicle Energy Consumption and Emissions (\$3,750,000)
U.S. Department of Energy. Sep 2025 – Present
- [2] **(Senior Researcher)** Safety Impact of Camera Monitoring Systems as Replacement for Rear Vision Mirrors on Commercial Motor Vehicles(\$700,000)
U.S. DOT Federal Motor Carrier Safety Administration. May 2023 – Mar 2024
- [1] **(Senior Researcher)** Applying Artificial Intelligence (AI) Based Signal Coordination and Controls for Optimized Mobility for the Nimitz Highway and Ala Moana Boulevard Arterial in Honolulu (\$2,200,000)
U.S. Department of Energy. Aug 2021 – Sep 2024

UNIVERSITY OF CENTRAL FLORIDA

- [11] **(Co-Principal Investigator)** ATTAIN: Intersection Signal Prediction and Corridor Traffic Management Based on Big-Data Analytics and Cutting-Edge Technologies (\$500,000)
Federal Highway Administration (FHWA) ATCMTD. Oct 2020 – May 2021

- [10] **(Co-Principal Investigator)** NCHRP 22-48: Development of Crash Prediction Models for Short-Term Durations (\$650,000)
Transportation Research Board of the National Academies. Jul 2020 – May 2021
- [9] Crash Predictions for Expedited Detection (CPED) (\$294,942)
U.S. Department of Transportation Safety Data Initiative. Sep 2020 – May 2021
- [8] Improving Multimodal Traffic Safety for Multi-Lane Arterials (\$440,000)
Florida Department of Transportation. Feb 2020 – Apr 2022
- [7] Connecting the East Orlando Communities Project-Phase I
Federal Highway Administration (FHWA) ATCMTD. Aug 2019 – Aug 2020
- [6] Investigation of Driving Behavior at Alternative Intersection Designs and Safety Improvement: A Driver Simulator Study (\$125,627)
U.S.DOT University Transportation Center (SAFER-SIM). Aug 2019 – Apr 2021
- [5] Study of Intersection Turning Movement Estimation (\$100,000)
Florida Department of Transportation. Sep 2018 – Aug 2019
- [4] Pre-Deployment Study for the Connecting the East Orlando Communities Project
Federal Highway Administration (FHWA) ATCMTD. Feb 2018 – Feb 2019
- [3] Evaluation of Innovative Alternative Intersection Designs in the Development of Safety Performance Functions and Crash Modification Factors (\$486,640)
Florida Department of Transportation. Aug 2017 – May 2020
- [2] Integrated Freeway/Arterial Active Traffic Management (\$499,861)
Florida Department of Transportation. Feb 2017 – Oct 2019
- [1] Operational and Safety-Based Analyses of Varied Toll Lane Configurations
U.S.DOT University Transportation Center (SAFER-SIM). Aug 2016 – Aug 2017

HONORS & AWARDS

- 2026 BTSD Early Career Award – Transportation, Buildings and Transportation Science Division (BTSD), Oak Ridge National Laboratory Aug 2026
- 2026 R&D 100 Award, "Eco-VTrac: A Real-Time Energy Optimization System for Vehicles and Traffic Signals" (Principal Investigator), R&D World Aug 2026
- Supplemental Performance Award (FY2023, FY2024, FY2025), Oak Ridge National Laboratory Aug 2023 – Nov 2025
- Best Poster Award, The 19th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (IEEE MASS 2022) Oct 2022
- DOE OTT Energy I-Corps Cohort 14 (Entrepreneurial Lead of Team 171 Real-Twin) Mar 2022
- Best Paper Award (Second Place), China Journal of Highway and Transport Dec 2019
- Stage III Winner in the USDOT's Solving for Safety Visualization Challenge, U.S. Department of Transportation Nov 2019
Lead algorithm developer.
- Excellence Award, U.S.DOT University Transportation Center (SAFER-SIM) Oct 2019
- UCF College of Graduate Studies Presentation Fellowship, University of Central Florida Nov 2018
- UCF College of Graduate Studies Presentation Fellowship, University of Central Florida Nov 2017
- FRONTRUNNER 5000 Top Articles in Outstanding Journals of China, Institute of Scientific and Technical Information of China Oct 2017
- ORC Doctoral Fellowship, University of Central Florida Aug 2016
- Graduate Scholarship, Tongji University Sep 2013
- First Place of National Structural Design Competition, Central South University Nov 2011

PUBLICATIONS Google Scholar Citations: 3710; h-index: 29

BOOK CHAPTER

- [1] Xu, H., **Yuan, J.**, Zhou, A., Xu, G., Li, W., Ban, X. J., Ye, X. Generative Artificial Intelligence-Powered Multi-Agent Paradigm for Smart Urban Mobility: Opportunities and Challenges for Integrating Large Language Models and Retrieval-Augmented Generation with Intelligent Transportation Systems. *Urban Human Mobility*, 123-137.

PEER-REVIEWED JOURNALS

- [41] Luo, X., Xu, G., Saroj, A., **Yuan, J.**, Kadav, P., Shao, Y., and Wang, C., 2026. Agentic Traffic Intelligence: Augmented Human-In-The-Loop Scenario Generation for Microscopic Traffic Simulation. *Artificial Intelligence for Transportation*, 6: 100057.
- [40] **Yuan, J.***, LaClair, T., Wang, C., Li, W., Lim, H., Kadav, P., Berres, A., Xu, H., Ekti, A., Wang, H., Sanyal, J., Zhang, G., 2025. Integrated Traffic Signal and Vehicle Speed Control for Improving Energy Efficiency and Reducing Congestion. *Nature Communications (Conditionally Accepted)*.
- [39] Goulet, N., **Yuan, J.**, Cook, A., Beck, J., Wang, C., Chen, J., Chen, H., Li, E., 2025. Vehicle-in-the-Loop Testing for the Safety of Advanced Driver Assistance Systems: A Review. *Accident Analysis and Prevention (In Press)*.
- [38] Das, D., Han, X., Zhou, A., Hogue, D., Di Russo, M., **Yuan, J.**, Qiao, Z., Shen, S., Johnson, D., Stutenberg, K., Cook, A., Wang, C., Ma, J., Liu, H., 2025. Distributed Testing for Transportation Research: Real-Time Cloud-Based Co-Simulation of Heterogeneous Cooperative Driving Systems with V2X Communication. *IEEE Transactions on Intelligent Transportation Systems (In Press)*.
- [37] Xu, H., **Yuan, J.***, Berres, A., Shao, Y., Wang, C., Li, W., LaClair, T., Sanyal, J., and Wang, H., 2024. A Mobile Edge Computing Framework for Traffic Optimization at Urban Intersections Through Cyber-Physical Integration. *IEEE Transactions on Intelligent Vehicles*, 9(1), 1131-1145.
- [36] Moore, A., **Yuan, J.**, Ou, S., Torres, J. R., Sujana, V., and Siekmann, A., 2023. Key Considerations in Assessing the Safety and Performance of Camera-Based Mirror Systems. *Safety*, 9(4), 73.
- [35] Shi, Y., Wang, Z., LaClair, T.J., Wang, C., Shao, Y., and **Yuan, J.**, 2023. A Novel Deep Reinforcement Learning Approach to Traffic Signal Control with Connected Vehicles. *Applied Sciences*, 13(4), p.2750.
- [34] Mahmoud, N., Abdel-Aty, M., Cai, Q., and **Yuan, J.**, 2022. Estimating cycle-level real-time traffic movements at signalized intersections. *Journal of Intelligent Transportation Systems*, 26(4), pp.400-419.
- [33] Wang, X., Zhang, Q., Yang, X., Pei, Y., and **Yuan, J.**, 2022. Traffic safety analysis and model updating for freeways using Bayesian method. *Journal of Transportation Safety & Security*, (2022): 1-23.
- [32] Abdel-Aty, M., Wu, Y., Zheng, O. and **Yuan, J.**, 2022. Using closed-circuit television cameras to analyze traffic safety at intersections based on vehicle key points detection. *Accident Analysis & Prevention*, 176, p.106794.
- [31] Cheng, Z., **Yuan, J.**, Yu, B., Lu, J., and Zhao, Y., 2022. "Crash Risks Evaluation of Urban Expressways: A Case Study in Shanghai". *IEEE Transactions on Intelligent Transportation Systems*, (2022).
- [30] Abdelraouf, A., Abdel-Aty, M., **Yuan, J.**, 2021. "Utilizing Attention-Based Multi-Encoder-Decoder Neural Networks for Freeway Traffic Speed Prediction". *IEEE Transactions on Intelligent Transportation Systems*, (2021).
- [29] Li, Y., Li, M., **Yuan, J.**, Lu, J., Abdel-Aty, M., 2021. "Analysis and prediction of intersection traffic violations using automated enforcement system data". *Accident Analysis & Prevention*, 162 (2021): 106422.
- [28] Abdelrahman, A., Abdel-Aty, M., **Yuan, J.***, and Al-Omari, M.E.M., 2021. "Systematic Safety Evaluation of Diverging Diamond Interchanges Based on Nationwide Implementation Data". *Transportation Research Record*, 2675(9), pp.961-971.
- [27] Wang, X., Pei, X., Yang, M., and **Yuan, J.**, 2021. "Meso-level hotspot identification for suburban arterials". *Accident Analysis & Prevention*, 156 (2021): 106148.
- [26] **Yuan, J.***, Abdel-Aty, M., Fu, J., Wu, Y., Yue, L., and Eluru, N., 2021. "Developing Safety Performance Functions for Freeways at Different Aggregation Levels Using Multi-State Microscopic Traffic Detector Data". *Accident Analysis & Prevention*, 151: 105984.
- [25] Mahmoud, N., Abdel-Aty, M., Cai, Q., and **Yuan, J.**, 2021. "Predicting cycle-level traffic movements at signalized intersections using machine learning models". *Transportation Research Part C: Emerging Technologies*, 124: 102930.
- [24] Islam, Z., Abdel-Aty, M., Cai, Q., and **Yuan, J.**, 2021. "Crash data augmentation using variational autoencoder". *Accident Analysis & Prevention*, 151: 105950.

- [23] Li, P., Abdel-Aty, M., and **Yuan, J.**, 2020. "Using bus critical driving events as surrogate safety measures for pedestrian and bicycle crashes based on GPS trajectory data". *Accident Analysis & Prevention*, 150: 105924.
- [22] Gong, Y., Abdel-Aty, M., **Yuan, J.**, and Cai, Q., 2020. "Multi-objective reinforcement learning approach for improving safety at intersections with adaptive traffic signal control". *Accident Analysis & Prevention*, 144: 105655.
- [21] Yue, L., Abdel-Aty, M., Wu, Y., **Yuan, J.**, and Morris, M., 2020. "Influence of pedestrian-to-vehicle technology on drivers' response and safety benefits considering pre-crash conditions". *Transportation Research Part F: Traffic Psychology and Behaviour*, 73: 50-65.
- [20] Yue, L., Abdel-Aty, M., Wu, Y., and **Yuan, J.**, 2020. "An Augmentation Function for Active Pedestrian Safety System Based on Crash Risk Evaluation". *IEEE Transaction on Vehicular Technology*.
- [19] Cai, Q., Abdel-Aty, M., **Yuan, J.**, Lee, J., Wu, Y., 2020. "Real-time crash prediction on expressways using deep generative models". *Transportation Research part C: emerging technologies*, 117: 102697.
- [18] **Yuan, J.***, Abdel-Aty, M., Yue, L., and Cai, Q., 2020. "Modeling Real-Time Cycle-Level Crash Risk at Signalized Intersections Based on High-Resolution Event-Based Data". *IEEE Transaction on Intelligent Transportation Systems*.
- [17] Xing, L., He, J., Abdel-Aty, M., Wu, Y., **Yuan, J.**, 2020. "Time-varying analysis of traffic conflicts at the upstream approach of toll plaza". *Accident Analysis & Prevention*, 141: 105539.
- [16] Zhang, S., Abdel-Aty, M., **Yuan, J.**, Li, P., 2020. "Prediction of Pedestrian Crossing Intentions at Intersections Based on Long Short-Term Memory Recurrent Neural Network". *Transportation Research Record: Journal of the Transportation Research Board*, (2020): 0361198120912422. (Selected in the 2024 promotional issue of the TRR Journal because it was among the top-cited papers)
- [15] Yue, L., Abdel-Aty, M., Wu, Y., Zheng, O., and **Yuan, J.***, 2020. "In-depth approach for identifying crash causation patterns and its implications for pedestrian crash prevention". *Journal of Safety Research*, 73: 119-132. (One of the most cited articles from the Journal of Safety Research published since 2021)
- [14] Li, Y., Abdel-Aty, M., and **Yuan, J.**, Cheng, Z., Lu, J., 2020. "Analyzing Traffic Violation Behavior at Urban Intersections: A Spatial-Temporal Kernel Density Estimation Approach Using Automated Enforcement System Data". *Accident Analysis & Prevention*, 141: 105509.
- [13] Formosa, N., Quddus, M., Ison, S., Abdel-Aty, M., and **Yuan, J.**, 2020. "Predicting real-time traffic conflicts using deep learning". *Accident Analysis & Prevention*, 136: 105429. (The 8th most cited articles from the Accident Analysis and Prevention published since 2021)
- [12] Li, P., Abdel-Aty, M., and **Yuan, J.**, 2020. "Real-Time Crash Risk Prediction on Arterials Based on LSTM-CNN". *Accident Analysis & Prevention*, 135: 105371. (The second most cited articles from the Accident Analysis and Prevention published since 2021)
- [11] Xing, L., He, J., Li, Y., Wu, Y., **Yuan, J.**, and Gu, X., 2020. "Comparison of different models for evaluating vehicle collision risks at upstream diverging area of toll plaza". *Accident Analysis & Prevention*, 135: 105343.
- [10] Cai, Q., Abdel-Aty, M., Sun, Y., Lee, J., and **Yuan, J.**, 2019. "Applying a deep learning approach for transportation safety planning by using high-resolution transportation and land use data". *Transportation Research Part A: Policy and Practice*, 127: 71-85.
- [9] **Yuan, J.***, Abdel-Aty, M., Gong, Y., and Cai, Q., 2019. "Real-Time Crash Risk Prediction Using Long Short-Term Memory Recurrent Neural Network". *Transportation Research Record: Journal of the Transportation Research Board*, 2673 (4): 314-326. (The third-most cited article in 2020 from the TRR journal)
- [8] **Yuan, J.***, Abdel-Aty, M., Cai, Q., and Lee, J., 2019. "Investigating Drivers' Mandatory Lane Change Behavior on the Weaving Section of Freeway with Managed Lane: A Driving Simulator Study". *Transportation Research Part F: Traffic Psychology and Behavior*, 62: 11-32.

- [7] Gu, X., Abdel-Aty, M., Xiang, Q., Cai, Q., and **Yuan, J.**, 2019. "Utilizing UAV Video Data for In-depth Analysis of Drivers' Crash Risk at Interchange Merging Areas". *Accident Analysis & Prevention*, 123: 159-169.
- [6] **Yuan, J.***, Abdel-Aty, M., Wang, L., Lee, J., Yu, R., and Wang, X., 2018. "Utilizing Bluetooth and Adaptive Signal Control Data for Real-Time Safety Analysis on Urban Arterials". *Transportation Research Part C: Emerging Technologies*, 97: 114-127.
- [5] **Yuan, J.*** and Abdel-Aty, M., 2018. "Approach-Level Real-Time Crash Risk Analysis for Signalized Intersections". *Accident Analysis & Prevention*, 119: 274-289.
- [4] Cai, Q., Saad, M., Abdel-Aty, M., **Yuan, J.**, and Lee, J., 2018. "Safety impact of weaving distance on freeway facilities with managed lanes using both microscopic traffic and driving simulations". *Transportation Research Record: Journal of the Transportation Research Board*, 2672 (39): 130-141.
- [3] Wang, X., **Yuan, J.**, Schultz, G., and Fang, S., 2018. "Investigating the safety impact of roadway network features of suburban arterials in Shanghai". *Accident Analysis & Prevention*, 113: 137-148.
- [2] Wang, X., and **Yuan, J.**, 2017. "Safety Impacts Study of Roadway Network Features on Suburban Highways". *China Journal of Highway and Transport*, 30 (4): 106-114.
(In Chinese, 2019 Best Paper Award (Second Place), China Journal of Highway and Transport)
- [1] Wang, X., **Yuan, J.**, and Yang, X., 2016. "Modeling Research of Crash Types at Signalized Intersections Base on the Random Effect Model". *Journal of Tongji University (Natural Science)*, 44 (01): 81-86.
(In Chinese, FRONTRUNNER 5000 Top Articles in Outstanding S&T Journals of China)

PATENTS & COPYRIGHTS

- [7] Wang, C., Xu, G., Saroj, A., Luo, X., **Yuan, J.**, and Shao, Y., 2025. "Real-Twin." *U.S. Department of Energy (DOE) software*.
- [6] **Yuan, J.**, Li, W., Wang, C., LaClair, T., Xu, H., Berres, A., Lim, H., Shao, Y., Wang, H., Ekti, A., and Sanyal, J. "Energy-Efficient Vehicle and/or Traffic Light Control." U.S. Patent Application No. 18/920,355; Publication US 2025/0131819 A1 (filed 2024; published 2025).
- [5] Xu, H., **Yuan, J.**, Wang, C., LaClair, T., Berres, A., Li, W., Shao, Y., Wang, H., and Sanyal, J. "Eco-Pilot-Energy-Efficient Vehicle Speed Advisory Through Vehicle-to-Infrastructure Communications." U.S. Patent No. 12,673,678 B2 (filed 2024; granted 2026).
- [4] Wang, X., Pei, Y., and **Yuan, J.** "A Meso-Level-Based Accident Prediction Method and Storage Medium for Suburban Arterial Roads." Chinese Patent CN113920725B (filed 2021; granted 2022).
- [3] Wang, H., Zhang, G., Wang, C., Shao, Y., Li, W., Athiban, A., and **Yuan, J.** "Artificial Intelligence Closed Loop Control for Traffic Signals of Multiple Intersections." U.S. Patent Application No. 18/819,850; Publication US 2025/0078655 A1 (filed 2024; published 2025).
- [2] Abdel-Aty, M., Zheng, O., Wu, Y., and **Yuan, J.** "Real-Time Traffic Safety Management System." U.S. Patent No. 11,908,317 B2 (filed 2021; granted 2024).
- [1] "Real-Time Proactive Traffic Safety Management UCF System Including Operator and Decision-Making Components." Software and user manual copyright, UCF CPY No. 34291.

INVITED TALKS

- [9] "Advancing Safety Evaluation of ADAS and Automated Vehicles through Vehicle-in-the-Loop (VIL) Testing". *IEEE ITSS Standards Committee Webinar Series*, Online. Oct 2025
- [8] "Navigating the Future: Data-Driven AI for Safe and Sustainable Vehicle and Mobility Systems (SVM)". *Colorado State University Department of Systems Engineering*, Fort Collins, Colorado, U.S. Mar 2025
- [7] "Beyond the Business Card: Building Real Career Connections". *Invited Talk at ORNL Energy Science and Technology Directorate Career Forum*, Knoxville, Tennessee, U.S. Jan 2025
- [6] "Social-Aware Eco-Driving in a Mixed Connected and Automated Vehicle Environment Using Hybrid Deep Reinforcement Learning". *Invited Talk at IRF Global R2T Conference*, Orlando, Florida, U.S. Dec 2024
- [5] "Enhancing Electric Vehicle Efficiency at Intersections via Connectivity: A Roadmanship-Aware Eco-Driving Strategy". *Invited Talk at ASCE ICTD 2024*, Atlanta, U.S. Jun 2024
- [4] "Navigating the Future: Data-Driven AI for Safe and Sustainable Vehicle and Mobility Systems (SVM)". *University of Oklahoma School of Civil Engineering and Environmental Science*, Norman, Oklahoma, U.S. May 2024
- [3] "Automatic ATSPM Detector Mapping". *FDOT District Five*, Orlando, U.S. Sep 2020

- [2] “Arterial-Level Real-Time Crash Risk Prediction Using Deep Learning”. *The 1st International Conference on Smart Tourism, Smart Cities and Enabling Technology*, Orlando, U.S. May 2019
- [1] “Approach-Level Real-Time Crash Risk Prediction at Signalized Intersection by Incorporating Bluetooth, Weather, and Adaptive Signal Control Data”. *University of Central Florida 2018 Graduate Research Forum*, Orlando, U.S. Apr 2018

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Conference/Workshop Organizer

- Session Chair (Moderator), “Advancing Large Language Models for Safer and Smarter Transportation Systems”, International Conference on Transportation & Development (ICTD 2025), ASCE 2025
- Co-Organizer, International Workshops on Computational Transportation Science (IWCTS) 2024, ACM SIGSPATIAL 2024
- Session Chair (Moderator), “Promoting Vehicle Automation Fueled by Equitable Financing and Technology Innovations”, International Conference on Transportation & Development (ICTD 2024), ASCE 2024

Membership

- Advisory Panel Member, The Research and Education for Promoting Safety (REPS) Tier 1 University Transportation Center, Howard University 2025 – Present
- Advisory Panel Member, TRB’s Behavioral Traffic Safety Cooperative Research Program (BTSCR) Project BTS-47: Assessing Effects of Speed Camera Programs on Pedestrian and Bicycle Crashes. 2025 – Present
- Chapter Secretary, IEEE Transportation Electrification Council-East Tennessee Chapter 2024 – Present
- Member, IEEE Vehicular Technology Society Committee on Autonomous Vehicles 2024 – Present
- Associate Committee Member, ASCE Transportation & Development Institute Artificial Intelligence Committee 2021 – Present
- Program Committee member, International Workshops on Computational Transportation Science (IWCTS), ACM SIGSPATIAL 2022 – 2024
- Younger Committee Member, ASCE Transportation & Development Institute Transportation Safety Committee 2019 – Present
- **Senior Member**, Institute of Electrical and Electronics Engineers (IEEE) 2024 – Present
- Member, American Society of Civil Engineers (ASCE) 2017 – Present
- Member, Institute of Transportation Engineers (ITE) 2017 – Present
- Member, Chinese Overseas Transportation Association (COTA) 2017 – Present

Referee

- Nature Communication 2025 – Present
- IEEE Transactions on Intelligent Transportation Systems 2021 – Present
- IEEE Transactions on Neural Networks and Learning Systems 2024 – Present
- IEEE Transactions on Vehicular Technology 2024 – Present
- IEEE Transactions on Intelligent Vehicles 2023 – Present
- IEEE Intelligent Transportation Systems Magazine 2023 – Present
- IEEE Transactions on Geoscience and Remote Sensing 2021 – Present
- IEEE Internet of Things Journal 2024 – Present
- Journal of Control and Decision 2022 – Present
- Transport Policy 2021 – Present
- Accident Analysis and Prevention 2017 – Present
- Transportation Research Part F: Psychology and Behavior 2018 – Present
- Transportation Research Part C: Emerging Technologies 2022 – Present
- Transportation Research Record: Journal of the Transportation Research Board 2018 – Present
- Journal of Intelligent Transportation Systems: Technology, Planning, and Operations 2019 – Present
- Traffic Injury Prevention 2018 – Present
- Journal of Advanced Transportation 2019 – Present
- Transportmetrica A: Transport Science 2018 – Present
- Journal of Transportation Safety & Security 2017 – Present
- Journal of Traffic and Transportation Engineering 2017 – Present
- Safety 2020 – Present

- Advances in Mechanical Engineering 2017 – Present
- Transportation Research Board Annual Meeting 2017 – Present
- ASCE International Conference on Transportation & Development 2018 – Present
- COTA International Conference of Transportation Professionals 2017 – Present
- Automated Vehicle Symposium 2018 – Present

Editorship

- Associate Editor, IEEE Transactions on Intelligent Vehicles 2026 – Present
- Associate Editor, IEEE Open Journal of Intelligent Transportation Systems 2026 – Present
- Editorial Board Member, Future Transportation 2021 – Present
- Guest Editor, Journal of Advanced Transportation, Special Issue on Emerging Technologies in Traffic Safety Risk Evaluation, Prevention, and Control 2019
- Review Editor, Frontiers in Future Transportation 2021 – Present

TEACHING & ADVISING EXPERIENCE

Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA

Mentor

- Joshua Aninyei, University of Tennessee, Knoxville Summer 2026
 - LaneLLM: Fine-Tuned Vision Language Model for Lane-Level Intersection Topology
- Parth Kadav, Western Michigan University Summer 2024
 - Social-Aware Eco-Driving in a Mixed Connected and Automated Vehicle Environment Using Hybrid Deep Reinforcement Learning
- Ankur Shiledar, Ohio State University Summer 2023
 - Enhanced Safety of Heavy-Duty Vehicles on Highways through Automatic Speed Enforcement – A Simulation Study
- Parth Kadav, Western Michigan University Summer 2023
 - Integrated Control of Vehicle Speeds and Traffic Signals for Reducing Congestion and Energy Use

University of Central Florida, Orlando, Florida, USA

Guest Lecturer

- CGN 5341: Interdisciplinary Introduction to Smart Cities' Applications Fall 2020
 - Lecture: Smart Transportation (Transportation Systems Management and Operations (TSMO))
 - Lecture: Smart Transportation (Deep Learning Based Traffic Prediction and Visualization)
 - Lecture: Smart Transportation (Connected and Automated Vehicles)
 - Lecture: Smart Transportation (Shared (Micro) Mobility)
- TTE 4274: Transportation System Engineering Fall 2020
 - Lecture: Artificial Intelligence in Transportation

Advisory Committee Member

- Lishengsa Yue Summer 2020 - Fall 2020
 - Master Thesis: Understanding E-Bicycle Overtaking Strategies by Using Inverse Reinforcement Learning
- Zubayer Islam Fall 2020 - Spring 2021
 - Ph.D. Dissertation: Using Machine Learning Algorithms in Critical Traffic Engineering Applications
- Ma'en Mohammad Ali Al-Omari Summer 2020 - Spring 2021
 - Ph.D. Dissertation: Evaluation of Unconventional Signalized Intersections on Arterial Roads and a Proposition for a Novel Intersection Design

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