YINA WU

Associate Professor (Research Track),
Department of Civil, Environmental & Construction Engineering,
University of Central Florida
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EDUCATION

Doctor of Philosophy, Civil Engineering (Transportation), University of Central Florida, Florida, USA

December 2017

Dissertation: Improving Safety under Reduced Visibility Based on Multiple Countermeasures and Approaches including Connected Vehicles (Advisor: Dr. Mohamed Abdel-Aty)

Master of Science, Civil Engineering (Transportation), University of Central Florida, Florida, USA

December 2014

Thesis: A Comparative Analysis of Different Dilemma Zone Countermeasures at Signalized Intersections based on Cellular Automaton Model (Advisor: Dr. Mohamed Abdel-Aty)

Bachelor of Engineering, Transportation Engineering, Beijing Jiaotong University, China

June 2012

ACADEMIC AND RESEARCH EXPERIENCE

Associate Professor (Research Track), Department of Civil, Environmental & Construction Engineering, University of Central Florida, Spring 2020 – Present

PI or Co-PI for multiple research projects:

- Phase III - ATTAIN: Intersection Signal Prediction and Corridor Traffic Management Based on Big-Data Analytics and Cutting-Edge Technologies, Funded by FDOT, ***co-PI***, 2020-2022
- Crash Predictions for Expedited Detection (CPED), Funded by USDOT, ***co-PI***, 2020-2021
- Phase II - ATTAIN: Improving Vulnerable Road Users' Safety Based on Computer-Vision Technologies and High-fidelity Hybrid Traffic Forecasting Tool for Urban Transportation Networks using Emerging Datasets, Funded by FDOT, ***co-PI***, 2020-2022
- Investigate the effects of V2X technologies for automated vehicles using virtual simulation and driving simulator experiments, Funded by SAFER-SIM, ***PI***, 2020-2021

Involve in the following project:

- NCHRP 22-48: Development of Crash Prediction Models for Short-Term Durations, 2020-2022

Postdoctoral Scholar, Department of Civil, Environmental & Construction Engineering, University of Central Florida, Spring 2018- Fall 2019

PI or Co-PI for multiple research projects:

- Investigating the Effects of Smartphone-based P2V Warning using Driving Simulator Experiments, Funded by SAFER-SIM, ***PI***, 2019-2020

- Assessing the Effectiveness of Connected Vehicle Technologies based on Driving Simulator Experiments, Funded by SAFER-SIM, ***PI***, 2018-2019
- Evaluation of Managed Lane Facilities in a Connected Vehicle Environment, Funded by SAFER-SIM***, Co-PI***, 2018-2020

Graduate Research Assistant, Department of Civil, Environmental & Construction Engineering, University of Central Florida, spring 2014- fall 2017

Conducted research related to reduced visibility, Traffic safety, Connected and Automated Vehicles, Simulation, etc. Involved projects as follows:

- The Impact of Connected Vehicle Market Penetration and Connectivity Levels on Traffic Safety in Connected Vehicles Transition Period, Funded by SAFER-SIM, 2017-2018
- A Driving Simulator Investigation of Road Safety Risk Mitigation under reduced Visibility, Funded by SAFER-SIM, 2017-2018
- Phase III: Real Time Monitoring and Prediction of Reduced Visibility Events on Florida's Highways, Funded by Florida Department of Transportation, 2016-2017.
- Phase II: Real Time Monitoring and Prediction of Reduced Visibility Events on Florida's Highways, Funded by Florida Department of Transportation, 2015-2017
- Operational and Safety-Based Analyses of Varied Toll Lane Configurations, Funded by SAFER-SIM, 2016-2017
- A Comprehensive Investigation of Visibility Problems on Highways: Developing Real Time Monitoring and Prediction System for Reduced Visibility and Understanding Traffic and Human Factors Implications, Funded by the UTC National Center for Transportation System Productivity and Management, 2014-2015
- Integration of Microscopic Big Traffic Data in Simulation-Based Safety Analysis, Funded by SAFER-SIM, 2014-2016

PROFESSIONAL EXPERIENCE

PROFESSIONAL SOCIETY MEMBERSHIPS & ACTIVITIES

- Editorial board Member, Accident Analysis & Prevention 2020- present
- Guest Editor, Sustainability, Special Issue "Accident Prevention and Risk Management for Safe and Sustainable Transportation" 2020-2021
- Committee member, TRB road weather committee 2020- present
- Young member, ASCE Transportation & Development Institute Transportation Safety Committee 2019- present

Journal Reviews

- Reviewer, Accident Analysis and Prevention. 2014-present
- Reviewer, Transportation Research Record 2016-present
- Reviewer, Transportation Research Part C 2017-present
- Reviewer, Transportation Injury Prevention 2017-present

- Reviewer, Journal of Traffic and Transportation Engineering 2018-present
- Reviewer, Journal of Journal of Transportation Safety & Security 2018-present
- Reviewer, IEEE Transactions on Intelligent Transportation Systems 2018-present
- Reviewer, Journal of Advanced Transportation 2019-present
- Reviewer, Transportmetrica A: Transport Science 2020-present
- Reviewer, International Journal of Transportation Science and Technology 2020-present
- Reviewer, The Journal of Visualized Experiments 2020-present
- Reviewer, IEEE Access 2020-present

TEACHING AND MENTORING EXPERIENCE

Teaching Experience

- Fall 2020, TTE 4274 Transportation Systems Engineering

Advisory Committee Member, University of Central Florida

- Master's thesis: Lishengsa Yue (2020). Understanding E-Bicycle Overtaking Strategies by Using Inverse Reinforcement Learning
- Master's thesis: Ahmed Abdelrahman (2020). Safety and Operational Evaluation of Displaced Left-Turn Intersections
- Ph.D. dissertation: Mdhasibur Rahman (2020). Evaluation of Safety and Mobility Benefits of Connected vehicles by considering V2V, V2I, and V2P Technologies
- Master's thesis: Morgan Morris (2019). Assessing Pedestrian Safety Conditions on Campus and Technical Solutions
- Master's thesis: Jiazheng Zhu (2018). Investigating and Facilitating the Transferability of Safety Performance Functions
- Master's thesis: Kamol Chandra Roy (2018). Understanding Crisis Communication and Mobility Resilience during Disasters from Social Media

PUBLICATIONS

Papers Published/Accepted for Publication

1. Rahman, M., Abdel-Aty, M., **Wu, Y.,** 2020, Transportation Research Part C: Emerging Technologies, Safety and Mobility Benefits of Connected and Automated Vehicles on Freeway: A Multi-Vehicle Communication System *(accepted)*
2. Yue, L., Abdel-Aty, M., **Wu, Y**., Yuan, J., & 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.
3. Zhang, S., Abdel-Aty, M., **Wu, Y.,** & Zheng, O. 2020. Modeling pedestrians' near-accident events at signalized intersections using gated recurrent unit (GRU). Accident Analysis & Prevention, 148, 105844.
4. **Wu, Y.**, Abdel-Aty, M., Wang, L., & Rahman, M. S. 2020. Combined connected vehicles and variable speed limit strategies to reduce rear-end crash risk under fog conditions. Journal of Intelligent Transportation Systems, 24, 494-513.

5. **Wu, Y.***, Abdel-Aty, M., Cai, Q., Zheng, O., Zhang, S., 2020. Automated safety diagnosis based on unmanned aerial vehicle videos and deep learning algorithm. Transportation Research Record: Journal of Transportation Research Board
6. 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 transactions on vehicular technology, 69(11), 12459-12469.
7. Abdel-Aty, M., **Wu, Y**.*, Saad, M., & Rahman, M. S. 2020. Safety and operational impact of connected vehicles' lane configuration on freeway facilities with managed lanes. Accident Analysis & Prevention, 144, 105616.
8. 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.
9. Xing, L., He, J., Abdel-Aty, M., **Wu, Y**., and Yuan J., 2020, Time-varying Analysis of Traffic Conflicts at the Upstream Approach of Toll Plazas, Accident Analysis & Prevention (accepted)
10. Yue, L., Abdel-Aty, M., **Wu, Y**., Zheng, O., & Yuan, J. 2020. In-depth approach for identifying crash causation patterns and its implications for pedestrian crash prevention. Journal of Safety Research.
11. Xing, L., He, J., Li, Y., **Wu, Y**., Yuan, J., Gu, X., 2020. Comparison of different models for evaluating vehicle collision risks at upstream diverging area of toll plaza, Accident Analysis & Prevention, 135, 105343.
12. **Wu, Y**., Abdel-Aty, M., Zheng, O., Cai, Q., Yue, L. 2019. Developing a crash warning system for the bike lane area at intersections with connected vehicles technology. Transportation Research Record: Journal of Transportation Research Board, 2673, pp.47-58
13. Yue, L., Abdel-Aty, M., **Wu, Y.**, Farid, A., 2019. The Practical Effectiveness of Advanced Driver Assistance Systems at Different Roadway Facilities: System Limitation, Adoption and Usage. IEEE Transactions on Intelligent Transportation Systems
14. Park, J., Abdel-Aty, M., **Wu, Y**. and Mattei, I., 2018. Enhancing In-Vehicle Driving Assistance Information under Connected Vehicle Environment. IEEE Transactions on Intelligent Transportation Systems.
15. **Wu, Y**., Abdel-Aty, M., Park, J. and Zhu, J., 2018. Effects of crash warning systems on rear-end crash avoidance behavior under fog conditions. Transportation Research Part C: Emerging Technologies, 95, pp.481-492.
16. Yue, L., Abdel-Aty, M., **Wu, Y.** and Wang, L., 2018. Assessment of the safety benefits of vehicles' advanced driver assistance, connectivity and low level automation systems. Accident Analysis & Prevention, 117, pp.55-64.
17. **Wu, Y**., Abdel-Aty, M., Cai, Q., Lee, J. and Park, J., 2018. Developing an algorithm to assess the rear-end collision risk under fog conditions using real-time data. Transportation Research Part C: Emerging Technologies, 87, pp.11-25.
18. **Wu, Y**., Abdel-Aty, M., Park, J. and Selby, R.M., 2018. Effects of real-time warning systems on driving under fog conditions using an empirically supported speed choice modeling framework. Transportation Research Part C: Emerging Technologies, 86, pp.97-110.

19. **Wu, Y**., Abdel-Aty, M. and Lee, J., 2018. Crash risk analysis during fog conditions using real-time traffic data. Accident Analysis & Prevention, 114, pp.4-11.

    Top cited paper in Accident Analysis and Prevention

20. **Wu, Y**., Abdel-Aty, M., Ding, Y., Jia, B., Shi, Q. and Yan, X., 2018. Comparison of proposed countermeasures for dilemma zone at signalized intersections based on cellular automata simulations. Accident Analysis & Prevention, 116, pp.69-78.

21. Zhang X., Ma, H., **Wu, Y.**, Pablos, P., Wang, W., 2014. Applying cloud computing technologies to upgrade the resource configuration of laboratory course: The case of quality engineering education platform. International Journal of Engineering Education

Technical Report Publications

1. **Wu, Y**., Abdel-Aty, M., and Yue, L., 2020, Assessing the Effectiveness of Connected Vehicle Technologies based on Driving Simulator Experiments. SAFER-SIM final report
2. Abdel-Aty, M., **Wu, Y**., Saad, M., and Rahman, M. S., 2019, Evaluation of Managed Lane Facilities in A Connected Vehicle Environment. SAFER-SIM final report
3. Abdel-Aty, M., Cai, Q., **Wu, Y.**, Hasan S., Li, P., Yuan, J., & Morris, M., 2019. Pre-Deployment Study for Connecting the East Orlando Communities Project (Task 3 Deliverable). Florida Department of Transportation
4. Abdel-Aty, M., Wang, L., and **Wu, Y**., 2018, The Impact of Connected Vehicle Market Penetration and Connectivity Levels on Traffic Safety in Connected Vehicles Transition Period. SAFER-SIM final report
5. Abdel-Aty, M., Park, J., **Wu, Y**., and Zhu, J., 2017. A Driving Simulator Investigation of Road Safety Risk Mitigation under Reduced Visibility. SAFER-SIM final report
6. Abdel-Aty, M., Oloufa, A., Eluru, N., Park, J., **Wu, Y**., and Zhu, J., 2017, Phase III: Real Time Monitoring and Prediction of Reduced Visibility Events on Florida's Highways, Funded by Florida Department of Transportation. Final Report. Florida Department of Transportation
7. Abdel-Aty, M., Carroll, K., **Wu, Y.,** Cai, Q., Shi, Q., and Selby R. 2016. Evaluation of Real-World Toll Plazas Using Driving Simulation. SAFER-SIM final report
8. Abdel-Aty, M., Shi, Q., Wang, L., **Wu, Y.,** Radwan, E., & Zhang, B. 2016. Integration of microscopic big traffic data in simulation-based safety analysis. Final Report of University Transportation Centers Program.
9. Abdel-Aty, M., Oloufa, A., Eluru, N., Park, J., **Wu, Y**., and Lee, J., 2016, Phase II: Real Time Monitoring and Prediction of Reduced Visibility Events on Florida's Highways, Funded by Florida Department of Transportation. Final Report. Florida Department of Transportation

REFEREED CONFERENCE PROCEEDINGS

1. **Wu, Y**., Abdel-Aty, M., Cai, Q., Zheng, O., Zhang, S., 2020. Automated safety diagnosis based on unmanned aerial vehicle videos and deep learning algorithm. Transportation Research Board 99th Annual Meeting, Washington, D.C.

2. Saad, M., Abdel-Aty, M., **Wu, Y.**, Rahman, S., 2020. Safety and operational impact of connected vehicles' lane configuration design on freeway facilities with managed toll lanes. Transportation Research Board 99th Annual Meeting, Washington, D.C.
3. Rahman, S., Abdel-Aty, M., **Wu, Y.**, Saad, M., 2020. Traffic safety and operational benefits of connected and automated vehicle on expressways: application of rea-world validated CAV data. Transportation Research Board 99th Annual Meeting, Washington, D.C.
4. Cai, Q., Abdel-Aty, M., Yuan J., Lee J., and **Wu, Y**. 2020. Applying a Deep Learning Method to Balance Data for Real-Time Crash Prediction on Expressways. Transportation Research Board 99th Annual Meeting, Washington, D.C.
5. Saad, M., Abdel-Aty, M., Lee, J., **Wu, Y**., & Rahman, M. S. 2019. Safety Analysis of Managed Toll Lanes Considering Connected Vehicles. In International Conference on Transportation and Development 2019: Smarter and Safer Mobility and Cities (pp. 52-61). Reston, VA: American Society of Civil Engineers.
6. Yue, L., Abdel-Aty, M., & **Wu, Y.** 2019. The Crash Avoidance Effectiveness of Advanced Driver Assistance Systems in Real-World Environment. In International Conference on Transportation and Development 2019: Smarter and Safer Mobility and Cities (pp. 41-51). Reston, VA: American Society of Civil Engineers.
7. **Wu, Y.**, Abdel-Aty, Ou, Z., Cai, Q., and Yue, L., 2019. Developing a crash warning system for the bike lane area at intersections with connected vehicles technology, Compendium of papers CD-ROM, Transportation Research Board 98th Annual Meeting, Washington, D.C.
8. **Wu, Y**., Abdel-Aty, Wang, L., and Rahman M., 2019, Improving flow and safety in low visibility conditions by applying connected vehicles and variable speed limits technologies, Compendium of papers CD-ROM, Transportation Research Board 98th Annual Meeting, Washington, D.C.
9. **Wu, Y**., Abdel-Aty, M., Park, J. and Zhu, J., 2018. Effects of Connected-Vehicle Warning Systems on Rear-End Crash Avoidance Behavior under Fog Conditions. Compendium of papers CD-ROM, Transportation Research Board 97th Annual Meeting, Washington, D.C.
10. Park, J., Abdel-Aty, M., **Wu, Y.** and Mattei, I., 2018. Optimization of In-Vehicle Warning and Assistance Information Design under Reduced Visibility in Connected Vehicle Environment. Compendium of papers CD-ROM, Transportation Research Board 97th Annual Meeting, Washington, D.C.
11. **Wu, Y**., Abdel-Aty, M., Park, J., 2017, Developing a rear-end crash risk algorithm under fog conditions using real-time data, 2017 5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS)
12. **Wu, Y**., Abdel-Aty, M., Park, J., Selby, R., 2017. Analysis of the impact of fog warning systems on driver behavior under reduced visibility conditions using a driving simulator. Compendium of papers CD-ROM, Transportation Research Board 96th Annual Meeting, Washington, D.C.
13. **Wu, Y**., Abdel- Aty, M., Cai, Q., Lee, J., Park, J., 2017. Rear-end collision risk algorithm under fog conditions based on kinematics analysis. Compendium of papers CD-ROM, Transportation Research Board 96th Annual Meeting, Washington, D.C.
14. **Wu, Y**., Abdel-Aty, M., Lee, J., 2016, Crash Risk Analysis under Fog Conditions on Full Access Controlled Highways Using Real-Time Traffic Data, Compendium of papers CD-ROM, Transportation Research Board 95th Annual Meeting, Washington, D.C.

15. **Wu, Y.,** Abdel-Aty, M., Jia B., 2015, Spatial and Temporal Risk Information Analysis Based on Cellular Automaton Simulation Model, 2015 Road Safety & Simulation International Conference.

AWARDS AND HONORS

- **Winner** (team award), Prince Michael International Road Safety Awards 2019
- **Winner** (team award), USDOT Visualization Challenge 2019
- **APHA Scholarship**, American Public Health Association 2017