Osama A. Osman

Lead Expert *of Intelligent Transportation Systems| Tatweer MEA | Abu Dhabi, UAE*

Chief Scientist | *Center for Urban Informatics and Progress | University of Tennessee at Chattanooga | United States of America*

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Professional Experience

2024 ~ current — **Lead Intelligent Transportation Systems Expert**
Tatweer MEA, Abu Dhabi, UAE
Spearheading efforts to incorporate innovation into smart mobility and traffic engineering solutions in the Emirate of Abu Dhabi. Identifying and creating business opportunities to strategically drive mobility advancements through emerging technologies and sustainable infrastructure. Managing partnerships and collaborating with Abu Dhabi Mobility – Integrated Transportation Center to identify and implement programs aiming at improving the future of smart mobility in Abu Dhabi through the application of connectivity, automation, and AI-driven solutions.

2021 ~ current — **Chief Scientist**
University of Tennessee at Chattanooga
Center for Urban Informatics and Progress, Chattanooga, Tennessee
Advising the center leadership on strategic planning and partnership decisions, identifying needs to grow funding streams, leading the development of project management plans, and supervising the team to deliver high-quality products supporting ITS applications and AI-driven solutions.

2023 ~ 2024 — **Strategic Growth Lead**
Leidos, Inc., Reston, VA, USA
Spearheading strategic planning and advisory services for ITS and transportation projects. Developing and implementing business strategies that aim to increase funding streams for ITS and smart city initiatives and promote the company growth in ITS work. Forming and managing partnerships and collaborating with stakeholders and government officials to identify and implement innovative solutions for urban development and digital infrastructure deployments.

2022~ 2023 — **Sr. Transportation Engineer and Project Manager**
Leidos, Inc., Reston, VA, USA
Leading the Federal Highway Administration's Projects on Connected and Automated Vehicles for freight trucks and multimodal transportation solutions. Supervising a multidisciplinary team of engineers to develop and test Intelligent Transportation Systems (ITS) and AI-driven solutions supporting connected and automated freight trucks and transit buses. Leading partnership formation and supporting relevant business development activities focusing on smart mobility solutions

2020 ~ — **Founding Director**

2021 University of Tennessee at Chattanooga
Smart Simulation, Analytics, and Modeling in Intelligent Transportation Systems Laboratory

2019 ~ 2021 **Tenure Track Assistant Professor**
University of Tennessee at Chattanooga
Department of Civil and Chemical Engineering, Chattanooga, Tennessee
Leading the intelligent transportation systems portfolio in the College of Engineering, establishing a new program on smart cities, designing and implementing advanced ITS and AI-driven solutions to improve traffic management and control in the City of Chattanooga. Was successful in leading partnerships with various agencies and securing, managing, and closing projects with a value over $16M.

2018 ~ 2019 **Research Associate**
Virginia Polytechnic Institute and State University
Center for Sustainable Mobility
Virginia Tech Transportation Institute, Blacksburg, Virginia
Leading research projects, supervising graduate students, performing advanced data analytics, evaluating research plans in the areas of connected and autonomous vehicle technology, developing programming interfaces and algorithms for traffic management and control as well as for connected/autonomous vehicle simulation, developing proposals to seek funding from federal and state agencies, and overseeing lab and field testing of transformative vehicular technologies. Example projects and studies include:

- Dynamic Feedback-Based Multimodal Trip Planning and Routing (funded by Ford Smart Mobility)
- Detection and Characterization of Risky Driving Behavior in Connected/Automated Vehicle Environments.

2016 ~ 2018 **Research Associate**
Louisiana State University
Department of Civil and Environmental Engineering, Baton Rouge, Louisiana
Managing several research projects, managing the research budget, managing the driving simulator lab, assistance in supervising and advising graduate and undergraduate students, seeking external funding opportunities and developing research proposals. Example projects include:

- Promoting Economic Development in the Baton Rouge Area, LA: Improving the Performance of the Transportation System through Supply-Oriented, Demand-Oriented and Economic Measures for Mitigating Traffic Congestion;
- Development of Guidelines for Ramp Metering Implementation and Performance Evaluation on I-12;
- Highway Work Zone Construction Safety Research and Training: A Driving Simulator Study;
- Performance Evaluation of Video Detection Systems for Turning Movement Counts at Signalized Intersections;
- Exploring Naturalistic Driving Data for Distracted Driving Measures;
- Exploring Naturalistic Driving Study (NDS) Data and Roadway Information Database (RID) for Emerging Applications in Traffic Safety

2011 - 2015 **Graduate Research Assistant**
Louisiana State University
Civil and Environmental Engineering Department, Baton Rouge, Louisiana
Working on several research projects related to traffic operation and control, intelligent transportation systems, and traffic safety. Specific tasks included data collection, data analysis, development of simulation models, coding, and assistance in final reports development. Example projects included:

- Development of a Simulation Test Bed for Connected Vehicles using the LSU Driving Simulator;
- Development of an Optimal Ramp Metering Control Strategy for I-12 in Baton Rouge, Louisiana;
- Real Time Driver Information for Congestion Management, A synthesis project;
- Modeling the effect of gusty hurricane wind force on vehicles using LSU driving simulator
- Measuring the Effectiveness of Ramp Metering Strategies on I-12 in Baton Rouge, Louisiana;
- Establishing an Intelligent Transportation Systems (ITS) Lab at Louisiana Transportation Research Center (LTRC);

2011 - 2012 **Graduate Teaching Assistant**
Louisiana State University
Civil and Environmental Engineering Department, Baton Rouge, Louisiana
Assisting in teaching the Surveying lab for the Plane Surveying and Measurements course (CE 3500)
Specific role included giving pre-lab instructions on the assigned surveying tasks to the students, guiding and directing the students throughout the lab time, and providing post-lab assistance through office hours.

2006 - 2011 **Teaching Assistant**
Cairo University
Cairo, Egypt
Assisting in teaching Highway Engineering (PBW401), Highway and Airport Engineering (elective course), Transport Planning and Traffic Engineering (PBW 301), Applied Statistics (CIV102), and Surveying (PBW 101)
Specific role included teaching practical sessions, providing post-session assistance to students through office hours, and guiding and directing senior students in their graduation projects

2006 - 2011 **Transportation Engineer**
Civil and Environmental Engineering Group (CEEG)
Cairo, Egypt
Participating in the design of many high profile projects that have been carried out by CEEG in association with Renardet S.A. Consulting Engineering (In Sultanate of Oman) and other international consultants. The work was performed for numerous clients from the private sector and the government in the sultanate of Oman, Saudi Arabia, Republic of Yemen, and Africa. Projects included:

- Roadway Geometric Design (total of 7 projects in Yemen and Oman)
- Airports Geometric Design (total of one project in Saudi Arabia)

- Feasibility Study Projects (total of one project in Yemen)
- Traffic Operation and Impact Studies (total of 13 projects in Yemen, Oman, Saudi Arabia, Adis Ababa, and Egypt)

2006 – 2009 **Pavement Quality Control Engineer**
Highway and Airport Engineering Laboratory
Cairo University
Cairo, Egypt
Managing the quality control experiments for several high profile highway and airport paving projects.

Education

Ph.D. Civil and Environmental Engineering (December, 2015)
Louisiana State University, Baton Rouge, Louisiana
- Transportation Engineering
- GPA 4.0
- Dissertation: Connected Vehicles Technology: User and System Performance Characteristics

M.S. Civil Engineering (May, 2010)
Cairo University, Cairo, Egypt
- Transportation Engineering
- GPA 3.7
- Thesis: Modeling and Macroscopic Simulation of Traffic Streams on Multi-Lane Highways

B.S. Civil Engineering (May, 2006)
Cairo University, Cairo, Egypt
- Highway and Airports Engineering
- GPA 3.9 (Honors degree; ranked 2nd in class)

Research Grants and Proposals - Total Awarded Grants ($24.4M)

*(Notes: Collaborative with *University of Alabama in Huntsville; **Oklahoma State University; #Appointed as PI Effective Sep. 2017)*

2024-2026
1. "SMART- Interoperable Connectivity for Improving City-Wide Operations and Safety," Funded by the United States Department of Transportation, $1,991,454, **Role (Co-PI).**

2023-2026
2. "Advanced Artificial Intelligence Research for Equitable Safety of Vulnerable Road Users," Funded by the Federal Highway Administration, $1,441,232, **Role (Co-PI).**
3. "Road Features for Automated Driving Systems Readiness Framework, Inventory, and Condition Assessment Development," Funded by the Federal Highway Administration, $499,868.7. **Role (Task Lead)**.
4. "Traffic Signal Change and Clearance Interval Pooled Fund Study – Conduct Methodology Research - Phase II," Funded by the Federal Highway Administration, $517,875, **Role (Task Lead)**

2022-
5. "Research Into Automated Port Operations and Automated Commercial

2024 Motor Vehicle Operations – Phase II," Funded by the Federal Highway Administration and Intelligent Transportation Systems Joint Programs Office of the United States Department of Transportation, $2,633,818, **Role (Project Manager).**

2022-2025
6. "End-to-End Decision Support System for Integrated Smart Electric Grid and Transportation System Management," Funded by the United States Department of Transportation, $9,200,000, **Role (Lead PI from UT Chattanooga).**
7. "Development of Port Community Information System (PCIS) Proof of Concept (POC) System," Funded by the United Stated Department of Transportation, $1,200,000, **Role (System Development Lead – Co-PI).**

2022-2023
8. "Developing a Framework for Analysis, Modeling, and Simulation (AMS) of Automated Trucks," Funded by the Federal Highway Administration, $450,000, **Role (PI)**

2021-2022
9. "Research Into Automated Port Operations and Automated Commercial Motor Vehicle Operations – Phase I," Funded by the Federal Highway Administration and Intelligent Transportation Systems Joint Programs Office of the United States Department of Transportation, $1,821,000, **Role (Project Manager).**

2020-2023
10. "CCRI: New: RUI: Testbed as-a Service: A Sandbox for Fostering Smart and Connected City Research & Development," Funded by the National Science Foundation, $1,374,885, **Role (Co-PI).**
11. "A defense-in-depth approach for operable and safe connected vehicles," Funded by the Oak Ridge National Laboratory and the US Department of Energy, $275,000, **Role (Co-PI).**
12. "Development of an Integrated Human-in-the-Loop Simulation Platform for Smart City Applications," Funded by the Center of Excellence in Applied Computational Science and Engineering, $99,998, **Role (PI).**
13. "Developing an Energy-Conscious Traffic Signal Control System for Optimized Fuel Consumption in Connect Vehicle Environments," Funded by the U.S. Department of Energy, $1,893,168, **Role (Co-PI).**

Resigned for Accepting Job at VTTI

2018-2019
14. **Osman, O. A. (PI)** and J. Codjoe, "Investigating and Analyzing Factors Affecting Lane-Capacity Variations in the Roadway Network in Baton Rouge, LA," Funded by the Transportation Consortium of South-Central States (Tran-SET UTC) and Louisiana Transportation Research Center, $90,000.
15. **Osman, O. A. (PI)** and J. Codjoe, "Truck Crash Causation in Louisiana," Funded by the Transportation Consortium of South-Central States (Tran-SET UTC) and Louisiana Transportation Research Center, $50,000.
16. *Ishak, S. and **O. A. Osman (Co-PI)**, "Crash Risk Assessment and Quantification Using the SHRP2 Naturalistic Driving Study Data," Funded by the Louisiana Transportation Research Center, $100,000.

Finalized

2017 – 2019
17. ***Osman, O. A. (PI)** and S. Ishak, "Development of Guidelines for Ramp Metering Implementation and Performance Evaluation on I-12," Louisiana Transportation Research Center, $199,947.

2017 –
18. **Ahmed, S., **O. A. Osman (Co-PI)**, and J. Codjoe, "Promoting Economic

2018 Development in the Baton Rouge Area, LA: Improving the Performance of the Transportation System through Supply-Oriented, Demand-Oriented and Economic Measures for Mitigating Traffic Congestion," Transportation Consortium of South-Central States (Tran-SET UTC), $210,000.

2017 19. **#Osman, O. A. (PI)**, "Development of a Simulation Test Bed for Connected Vehicles using the LSU Driving Simulator," Louisiana Transportation Research Center, $150,000.

2016 20. Ishak, S. and **O. A. Osman** (Co-PI), "Exploring Naturalistic Driving Study (NDS) Data and Roadway Information Database (RID) for Emerging Applications in Traffic Safety," National Center for Intermodal Transportation for Economic Competitiveness, $50,000.

Publications

*(Note: * Contributed Equally to the Work)*

Peer Reviewed Articles

2023

1. Palit, J., R., and **O. A. Osman** (2023). Application of LiDAR Data for Deep Learning Based Near Crash Prediction at Signalized Intersection. In the Journal of Transportation Technologies
2. Palit, J., R., and **O. A. Osman** (2023). Travel Patterns and Street Networks: A Novel Visualization Methodology of City-Level Traffic Flows and Network Usability. In the Journal of Transportation Technologies.

2022

3. Gavric, S., D. Nemanjia, I. G. Irdagi, A. Stevanovic, and **O. A. Osman** (2022). Estimation of Arrivals on Green at Signalized Intersections Using Stop-bar Video Detection Transportation Research Board. In the Journal of Transportation Research Record.
4. Osman, O. A. and J. Babatunde (2022). A Fuel-Based Nash Bargaining Approach for Adaptive Signal Control in an N-Player Cooperative Game. In the Journal of Transportation Research Record.

2021

5. **Osman, O. A.,** and M. Hajij (2021). Crash Prediction for Advanced Driver Assistance Systems: Development and Comparative Analysis of Advanced Deep Learning Techniques. In the Journal of Transportation Research Record.
6. Mousavi, M., **O. A. Osman**, D. Lord, and K. Dixon (2021). Investigating the Safety and Operational Benefits of Mixed Traffic Environments in the Proximity of a Driveway on an Urban Arterial. In the Journal of Accident Analysis and Prevention.
7. Roland, J., P. May, M. Sartipi, and **O. A. Osman** (2021). Spatio-Temporal Accident Prediction: Effects of Negative Sampling on Understanding Network-Level Accident Occurrence. In the journal of Transportation Research Record.

2020

8. Osman, O. A., P. R. Bakhit and S. Ishak (2020). Analysis of Queue Estimation Process at Signalized Intersections Under Low Connected Vehicle Penetration Rates. In press for publication in the Canadian Journal of Civil Engineers.
9. **Osman, O. A.** and H. Rakha. Characterization of Drivers' Engagement in Secondary Tasks: Application of Deep Learning for Data-Driven In-Vehicle Systems (2020). In the Transportation Research Record Journal of the Transportation Research Board.
10. Karbalaieali, S., **O. A. Osman**, and S. Ishak. A Dynamic Cooperative Merging Control Algorithm for Connected Automated Vehicles. IEEE

Transactions on Intelligent Transportation Systems, Vol. 21, no. 10, 2020, pp. 4111-4122.

2019 11. Karbalaieali, S., **O. A. Osman**, and S. Ishak (2019). A Dynamic Cooperative Merging Control Algorithm for Connected Automated Vehicles. IEEE Transactions on Intelligent Transportation Systems.

12. **Osman, O. A.,** M. Hajij, P. R. Bakhit, and S. Ishak (2019). Prediction of Near-Crashes from Observed Vehicle Kinematics Using Machine Learning. Transportation Research Record: Journal of the Transportation Research Board.

13. Ashley, G., **O. A. Osman**, S. Ishak, and J. Codjoe. Investigating The Effect of Driver, Vehicle, and Road Related Factors on Location Specific Crashes Using Naturalistic Driving Data. Transportation Research Record: Journal of the Transportation Research Board, Vol. 2673, no. 6, 2019, pp.46-56.

14. **Osman, O. A.,** M. Hajij, S. Karbalaieali, and S. Ishak (2019). A hierarchical machine learning classification approach for secondary task identification from observed driving behavior data. Accident Analysis and Prevention, Vol. 123, 2019, pp. 274-281.

2018 15. Bakhit, P. R., **O. A. Osman**, and S. Ishak (2018). A Distraction Index for Quantification of Eye Glance Behavior: A Study Using NEST Data. In press for publication in the Journal of Safety Science, https://doi.org/10.1016/j.ssci.2018.11.009.

16. Mousa, S. R., P. R. Bakhit, **O. A. Osman**, and S. Ishak (2018). A Comparative Analysis for Tree-Based Ensemble Methods for Detecting Imminent Lane Change Maneuvers in Connected/Automated Vehicle Environments. Transportation Research Record: Journal of the Transportation Research Board, https://doi.org/10.1177/0361198118780204.

2017 17. Wan, L., D. Cheng, R. Bian, S. Ishak and **O. A. Osman**. Accounting for Travel Time Reliability, Trip Purpose and Departure Time Choice in an Agent-Based Dynamic Toll Pricing Methodology. IET Journal of Intelligent Transportation Systems, 2017, DOI 10.1049/iet-its.2017.0004.

18. Bakhit, P. R., **O. A. Osman** and S. Ishak. Detecting Imminent Lane Change Maneuvers in Connected Vehicle Environments. Transportation Research Record: Journal of the Transportation Research Board, Vol. 2645, 2017, DOI 10.3141/2645-18.

19. M. Ye, **Osman, O. A.,** and S. Ishak. Accounting for Driver Distraction and Socioeconomic Characteristics in a Crash Risk Index: A Naturalistic Driving Study. Transportation Research Record: Journal of the Transportation Research Board, Vol. 2659, 2017, DOI 10.3141/2659-22.

20. **Osman, O. A.***, M. Ye*, S. Ishak, and B. Hashemi. Detection of Driver Engagement in Secondary Tasks from Observed Naturalistic Driving Behavior. Journal of Accident Analysis and Prevention, Vol. 106, 2017, pp. 385-391.

2016 21. **Osman, O. A.**, and Sherif Ishak. Genetic Algorithm–Based Approach for Optimal Deployment of Roadside Units in Connected and Automated Vehicle Environments. Transportation Research Record: Journal of the Transportation Research Board, Vol. 2595, 2016. pp. 139-147.

22. Mousa, S. R., J. Codjoe, **O. A. Osman**, S. Jenkins, P. R. Bakhit, S. Ishak., J. Bonnette. Impact of Geometric, Traffic, and Environmental Conditions on Video Detection Performance: A Case Study in Baton Rouge Metropolitan Area. Journal of Traffic and Logistics Engineering, Vol. 4, No. 2, 2016. pp.

160-166.

23. Ishak, S., S. Jenkins, Y. Qi, J. Codjoe, and **O. A. Osman**. Statistical Evaluation of Ramp Metering for a Dual Freeway Corridor. MedCrave Online Journal of Civil Engineering, Vol. 1, no. 1, 2016.

2015

24. **Osman, O. A.** and S. Ishak. A Network Level Connectivity Robustness Measure for Connected Vehicle Environments. Transportation Research Part C: Emerging Technologies, Vol. 53, 2015. pp. 48-58.
25. **Osman, O. A.**, J. Codjoe, and S. Ishak. Impact of Time-to-Collision Information on Driving Behavior in Connected Vehicle Environments Using A Driving Simulator Test Bed. Journal of Traffic and Logistics Engineering. Vol. 3, no. 1, 2015. pp. 18-24.
26. **Osman, O. A.**, J. Codjoe, S. Ishak, J. Rodriguez, and M. Russell. Long-term evaluation of the operational performance of fixed time ramp metering control strategy: a freeway corridor study. Canadian Journal of Civil Engineering. Vol. 42, no. 11, 2015. pp. 910-918.

2014

27. Rodriguez, J. M., J. Codjoe, **O. A. Osman**, S. Ishak, and B. Wolshon. Experimental modeling of the effect of hurricane wind forces on driving behavior and vehicle performance. Journal of emergency management (Weston, Mass.), Vol. 13, no. 2, 2014. pp.159-172.

Book Chapters

2018

28. **Osman, O. A.** and S. Ishak. Prediction of Travel Time Estimation Accuracy In Connected Vehicle Environments. In Recent Developments in Railway Track and Transportation Engineering, pp. 72-87, Springer, 2017, ISBN 978-3-319-61627-8.

Work Under Review

2024

29. Theriot, M. A., **O. A. Osman**, S. Ishak, C. Alecsandru, S. Mousa, and P. Bakhit (2024). Experimental Study of the Impact of Market Penetration on the Effectiveness of Blind Spot Alerts in Connected Vehicle Environments. Under review for publication in the Journal of Intelligent Transportation Systems.
30. **Osman, O. A.** and M. Hajij (2024). Crash Prediction Based on Similarity of Vehicle Kinematics Profiles. Under review for publication in the Journal of Transportation Safety and Security.

Conference Proceedings and Presentations

2024

1. **Osman, O. A.** and P. Bujanuvic. Cooperative Driving Automation: Facilitating Automated Trucks Interactions with Emergency Vehicles. Presented at The ITS America Conference, Arizona, USA, April 2024.

2023

2. **Osman, O. A.** and P. Bujanuvic. Cooperative Driving Automation: Facilitating Automated Trucks Interactions with Emergency Vehicles. Presented at the 102nd Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2023.

2022

3. **Osman, O. A.** and E. Leslie. Application of Cooperative Driving Automation for Automated Port Drayage Operations: Development and Full Scale Testing Results. Presented at the ITE International Annual Meeting and Exhibition, New Orleans, LA, August 2022.

4. **Osman, O. A.** and E. Leslie. Application of Cooperative Driving Automation for Automated Port Drayage Operations: Development and Full Scale Testing Results. Presented at the Automated Road Transportation Symposium, Garden Grove, CA, July 2022.

2021

5. Phan, L., J. Roland, T. Doan, M. Sartipi, **O. A. Osman**, and K. Comstock. A Comparison of Logistic Regression and Long Short-Term Memory for Vehicular Crash Hotspot Prediction in Chattanooga, TN. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2021.
6. J. R. Palit and **O. A. Osman**. A Multi-Graph Convolutional Neural Network Model for Short-Term Prediction of Turning Movements at Signalized Intersections. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2021.
7. F. Khan and **O. A. Osman**. Car-Following and Psychology: A Review of State-of-the-Art Studies and Research Needs. Presented at the 100th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2021.

2020

8. **Osman, O. A.** and H. Rakha. Characterization of Drivers' Engagement in Secondary Tasks: Application of Deep Learning for Data-Driven In-Vehicle Systems. Presented at the 99th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2020.
9. **Osman, O. A.** and M. Hajij. Crash Prediction Based on Vehicle Kinematics Profile Similarity. Presented at the 99th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2020.

2019

10. Davis, H., P. Kornyoh, **O. A. Osman,** P. R. Bakhit, and D. Kolasani. Experimental Analysis of Users' Interaction with Automation in Malfunction Scenarios: A Driving Simulator Study. Presented at the Road Safety and Simulation Conference, Iowa City, Iowa, USA, October 2019.
11. Ahmed, S., **O. A. Osman**, and J. Codjoe. Mitigating Traffic Congestion on I-10 Mississippi River Bridge in Baton Rouge, LA. Presented at the MATEC Web of Conferences (Vol. 271, p. 06002). EDP Sciences. 2019.
12. Mousavi, M., **O. A. Osman**, and D. Lord. Impact of Major Road Traffic Volume on the Vehicle Density of Different Lanes of the Major Road in Proximity of a Driveway for Autonomous Vehicle vs. Conventional Vehicle Environments. Presented at the ASCE International Conference on Transportation and Development, Alexandria, VA, USA, June 2019.
13. **Osman, O. A.,** M. Hajij, P. R. Bakhit, and S. Ishak. Prediction of Near-Crashes from Observed Vehicle Kinematics Using Machine Learning. Presented at the 98th Annual Meeting of the Transportation Research Board, and publication in the Transportation Research Record: Journal of the Transportation Research Board, Washington, D.C., USA, January 2019.
14. Ashley, G., **O. A. Osman**, S. Ishak, and J. Codjoe. Investigating The Effect of Driver, Vehicle, and Road Related Factors on Location Specific Crashes Using Naturalistic Driving Data. Presented at the 98th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2019.
15. Davis, H., P. Kornyoh, **O. A. Osman,** P. R. Bakhit, and D. Kolasani. On User Interaction with Vehicle Automation: Investigation of Behavior of Different Groups of Users with Automation Failure. Presented at the 98th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2019.

2018

16. **Osman, O. A.** and H. Rakha. Application of Deep Learning for Characterization of Driver Engagement in Secondary Tasks. Presented at the Automated Vehicle Symposium, San Francisco, California, USA, July 2018.
17. **Osman, O. A.,** M. Hajij, S. Karbalaieali, and S. Ishak. A Bi-Level Methodology for Identification of Types of Secondary Tasks from Observed Driving Behavior Data: Application of Ensemble Tree Machine Learning Algorithms on SHRP2 NDS Data. Presented at the ASCE International Conference on Transportation and Development, Pittsburg, Pennsylvania, USA, July 2018.
18. **Osman, O. A.,** M. Hajij, S. Karbalaieali, and S. Ishak. A Bi-Level Machine Learning Classification for Identification of Types of Secondary Tasks from Observed Driving Behavior Data: A SHRP2 NDS Study. Presented at the 9th International Conference on Applied Human Factors and Ergonomics, Orlando, Florida, USA, July 2018.
19. Bakhit, P. R., **O. A. Osman**, and S. Ishak. Quantifying Driver Eye Glance Behavior and Levels of Distracted Driving in the SHRP2 NEST Driving Database. Presented at the 9th International Conference on Applied Human Factors and Ergonomics, Orlando, Florida, USA, July 2018.
20. Karbalaieali, S., **O. A. Osman**, and S. Ishak. Evaluation of a Novel Model for Cooperative Merging of Connected Automated Vehicles onto Automated Highways. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.
21. Mousa, S. R., M. Ragab, S. Ishak, and **O. A. Osman**. Developing a Framework of Eco-driving Application for Semi-Actuated Signal Control Considering Queue Effects. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.
22. Mousa, S. R., P. R. Bakhit, **O. A. Osman**, and S. Ishak. A Comparative Analysis for Tree-Based Ensemble Methods for Detecting Imminent Lane Change Maneuvers in Connected/Automated Vehicle Environments. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.
23. **Osman, O. A.,** M. Hajij, S. Karbalaieali, and S. Ishak. Crash and Near-Crash Prediction from Observed Vehicle Kinematics Data: A SHRP2 Naturalistic Driving Study. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.
24. **Osman, O. A.,** M. Hajij, S. Karbalaieali, and S. Ishak. A Bi-Level Methodology for Identification of Types of Secondary Tasks from Observed Driving Behavior Data: Application of Ensemble Tree Machine Learning Algorithms on SHRP2 NDS Data. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.
25. Bakhit, P. R., **O. A. Osman**, and S. Ishak. Quantifying Driver Eye Glance Behavior and Levels of Distracted Driving: A Naturalistic Driving Study. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., USA, January 2018.

2017

26. Mousa, S. R., S. Ishak, and **O. A. Osman**. Extracting Association Rules from the SHRP2 Naturalistic Driving Data: A Market Basket Analysis. Presented at the 10th SHRP 2 Safety Data Symposium: From Analysis to Results, Washington, D.C., USA, October 2017.
27. Ashley, G. N., **O. A. Osman**, S. Ishak, J. Codjoe, and B. Hashemi. Effect of Secondary Tasks and Driver Behavior on Crash/Near-Crash Risk: A

Naturalistic Driving Study. Presented at the 8th International Conference on Applied Human Factors and Ergonomics, Los Angeles, California, USA, July 2017.

28. **Osman, O. A.** and S. Ishak. Prediction of Travel Time Estimation Accuracy in CV Environments. Presented at the GeoMEast International Congress and Exhibition, Sharm Al-Sheikh, Egypt, July 2017.
29. **Osman, O. A.**, S. Ishak, and M. Ye. Crash Risk Analysis of Distracted Driving Behavior: Influence of Secondary Task Engagement and Driver Characteristics. Presented at the 9th International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design, Vermont, USA, June 2017.
30. **Osman, O. A.**, S. Ishak, and M. Ye. Crash Risk Analysis of Distracted Driving Behavior: Influence of Secondary Task Engagement and Driver Characteristics. Presented at the 6th International Naturalistic Driving Research Symposium, The Hague, Netherlands, June 2017.
31. **Osman, O. A.**, S. Ishak, and M. Ye. Crash Risk Analysis of Distracted Driving Behavior: Influence of Secondary Task Engagement and Driver Characteristics. Presented at the 5th International Conference on Architecture and Civil Engineering, Singapore, May 2017.
32. **Osman, O. A.**, S. Karbalaieali, and S. Ishak. Development of a Dynamic Cooperative Merging Control Algorithm for Connected and Automated Vehicle Environments. Presented in the TRB Freeway Simulation Subcommittee Meeting at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.
33. Bakhit P. R., **O. A. Osman** and S. Ishak. Detecting Imminent Lane Change Maneuvers in Connected Vehicle Environments. Presented at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.
34. **Osman O. A.**, M. Ye, and S. Ishak. Accounting for Driver Distraction and Socioeconomic Characteristics in a Crash Risk Index: A Naturalistic Driving Study. Presented at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.
35. **Osman O. A.**, M. Ye, S. Ishak, and B. Hasheminezhad. An ANN Model for Detecting Secondary Tasks from Driving Behavior Attributes: A Naturalistic Driving Study. Presented at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.
36. Ashley, G. N., **O. A. Osman**, S. Ishak, and J. Codjoe. Effect of Secondary Tasks and Driver Behavior on Crash/Near-Crash Risk: A Naturalistic Driving Study. Presented at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.
37. Theriot, M. A., **O. A. Osman**, S. Ishak, C. Alecsandru, S. Mousa, and P. Bakhit. Impact of Connected-Vehicle Market Penetration on the Effectiveness of Blind Spot Warning Applications: A Driving Simulation Study. Presented at the 96th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2017.

2016

38. **Osman O. A.**, M. Ye, and S. Ishak. An ANN Model for Detecting Secondary Tasks from Driving Behavior Attributes. Presented at the fifth International Symposium on Naturalistic Driving Research, Virginia, USA, August 2016.
39. **Osman, O. A.** and S. Ishak. Development of an Optimal Ramp Metering

Control Strategy for I-12. Presented at the 2016 Louisiana Transportation Conference, Louisiana, USA, March 2016.

40. **Osman, O. A.** and S. Ishak. A GA-Based Approach for Optimal Deployment of Road Side Units in Connected/Automated Vehicles Environments. Presented at the 95th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2016.
41. **Osman, O. A**, P. Bakhit, and S. Ishak. Queue Estimation at Signalized Intersections Using Basic Safety Messages in Connected Vehicle Environments. Presented at the 95th Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2016.

2015

42. **Osman, O. A.** and S. Ishak. Travel Time Estimation and Connectivity Robustness for Connected Vehicle Environments. Presented at 94th Annual Meeting of the Transportation Research Board, Washington, D.C, USA, January 2015.

2014

43. **Osman, O. A.** and S. Ishak. Accounting for Traffic Density and Market Penetration in a Newly Developed Connectivity Robustness Model for Connected Vehicles Environments. Presented at the 93rd Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2014.
44. Rodriguez, J. M., Codjoe, J., **O. A. Osman**, S. Ishak, and B. Wolshon. Experimental modeling of the effect of hurricane wind forces on driving behavior and vehicle performance. Presented at 93rd Annual Meeting of the Transportation Research Board, Washington D.C., USA, January 2014.

Technical Reports

2022

1. Leslie, E., **O. A. Osman**, S. Nallamothu, J. Smet, P. Bourelly, K. Garvis, H. Park, and K, Claussen. *Cooperative Driving Automation: Research into Automated Port Operations and Automated Commercial Motor Vehicle Operations- Final Report: Proof-of-Concept Port Drayage Use Case.* Federal Highway Administration | Intelligent Transportation Systems Joint Programs Office. No. FHWA-JPO-22-933.

2018

2. Ishak, S., **O. A. Osman**, M. Theriot, P. Bakhit, S. Karbalaieali, and S. Mousa. *Development of a Simulation Test Bed for Connected Vehicles using the LSU Driving Simulator*. Louisiana Transportation Research Center. No. FHWA/LA.19/586.
3. Ahmed, S., **O. A. Osman**, and J. Codjoe. *Mitigating Traffic Congestion on I-10 in Baton Rouge, LA: Supply- and Demand-Oriented Strategies & Treatments.* Tran-SET Project No. 17ITSLSU09. USDOT. 2018.

2017

4. Ishak, S., **O. A. Osman**, J. Codjoe, S. Jenkins, S. Karbalaieali, M. Theriot, P. Bakhit, and M. Ye. *Exploring Naturalistic Driving Data for Distracted Driving Measures*. No. FHWA/LA. 17/580. 2017.

2016

5. Ishak, S., **O. A. Osman**, G. Ashly, M. Theriot, M. Ye, and P. R. Bakhit. *Exploring Naturalistic Driving Study (NDS) Data and Roadway Information Database (RID) for Emerging Applications in Traffic Safety*. NCITEC. No. 2016-11. 2016.
6. Ishak, S., **O. A. Osman**, J. Codjoe, and S. Mousa. *Development of a Simulation Test Bed for Connected Vehicles using the LSU Driving Simulator*. Gulf Coast Research Center for Evacuation and Transportation Resiliency. No. NTC2014-SU-R-05. 2016.

2015

7. Ishak, S., **O. A. Osman**, S. Mousa, S. Karbalaieali, and P.

Bakhit. *Development of an Optimal Ramp Metering Control Strategy for I-12*. No. FHWA/LA. 08/507. 2015.

8. Ishak, S., **O. A. Osman**, R. Thapa, and S. Jenkins. *Real Time Driver Information for Congestion Management*. No. FHWA/LA. 08/543. 2015.

2013 9. Ishak, S., J. Codjoe, **O. A. Osman**, M. Russell, and J. Rodriguez. *Measuring the Effectiveness of Ramp Metering Strategies on I-12*. No. FHWA/LA. 08/507. 2013.

Invited Talks & Webinars

2023 1. *Driving Into Tomorrow: Role of Artificial Intelligence in Shaping the Future of Transportation.* Invited Talk as part of the Pacific Northwest Transportation Consortium Conference, October 2023, Seattle, WA.

2022 2. *Smart Cities and Electrification: End-to-End Decision Support Systems for Electric Vehicle Charging and Transportation System Management.* Invited Talk as part of the Southern States ITE Chapter, November 2022, Chattanooga, TN.

3. *Cooperative Driving Automation and Self-Driving Vehicle Technology.* Invited Talk at the University of Virginia, September 2022, Richmond, VA.

2021 4. *Leveraging 1/10th Scale Designs for Connected and Automated Vehicle Research*. Invited talk as part of the EverSTEM Education, December 2021, Seattle, WA.

2020 5. *Connected and Automated Vehicles: Role of Computer and Human-In-The-Loop Simulation in Advancing the Technology.* Invited talk as part of the Simulation and Capacity Analysis User Group of Louisiana, December 2020, Baton Rouge, LA.

6. *Connected Vehicle Technology: Performance Measurement and Planning.* Invited talk in the Department of Civil and Environmental Engineering at the University of Pittsburgh, October 2020, Pittsburgh, PA.

2018 7. *A Bi-Level Methodology for Identification of Types of Secondary Tasks from Observed Driving Behavior Data: Application of Ensemble Tree Machine Learning Algorithms on SHRP2 NDS Data.* Presented at the SHRP2 Data Tools Insight Webinar, organized by Virginia Tech Transportation Institute, April 2018, Online Webinar.

8. *Design and Evaluation of Connected Vehicle Safety Applications.* Invited talk in the Department of Civil and Geomatics Engineering at the California State University- Fresno, March 2018, Fresno, CA.

9. *How Effective Are Connected Vehicle Safety Applications? Investigation of Impact of CV Market Penetration in the Driving Simulator.* Invited talk at the 2018 Louisiana Transportation Conference, Baton Rouge, LA, February 2018, Baton Rouge, LA.

2017 10. *Connected Vehicle Technology: User and System Performance Characteristics*. Invited talk in the Department of Civil Engineering at the University of New Mexico, February 2017, Albuquerque, NM.

2016 11. *Genetic Algorithm Based Approach for Optimal Deployment of Road Side Units in Connected/Automated Vehicles Environments*. Presented at a webinar organized by the TRB committee on artificial intelligence and advanced computing applications in transportation-ABJ70, December 2016, Online Webinar.

12. *Connected Vehicle Technology: Selected Research Studies by LSU ITS*

Research Team. Invited talk for Graduate-level students in the Civil and Environmental Engineering Department, Louisiana State University, October 2016, Baton Rouge, LA.

2013 13. *Traffic Modeling and Simulation*. Invited Talk for Senior- and Junior-level Undergraduate Students in the Civil and Environmental Engineering Department, Louisiana State University, November 2013, Baton Rouge, LA.

Leadership Activities & Professional Services

2021 ~ current 1. Chair of Research Subcommittee of the Transportation Research Board (TRB) Standing Committee on Artificial Intelligence and Advanced Computing Applications in Transportation (AED50).

2019 ~ current 2. Committee Research Coordinator of the Transportation Research Board (TRB) Standing Committee on Artificial Intelligence and Advanced Computing Applications in Transportation (ABJ70 – Currently AED50).

2018 ~ 2021 3. Chair of Communication Subcommittee of the Transportation Research Board (TRB) Standing Committee on Artificial Intelligence and Advanced Computing Applications in Transportation (AED50).

2017 ~ current 4. Active Member of the Transportation Research Board (TRB) Standing Committee on Artificial Intelligence and Advanced Computing Applications in Transportation (AED50).

5. Active Member of the Society of Automotive Engineers (SAE) Shared and Digital Mobility Committee.

2015 ~ 2021 6. Website and communications coordinator for the TRB Standing Committee on Artificial Intelligence and Advanced Computing Applications in Transportation (AED50).

Proposal Review Committee

2017 ~ 2021 7. UTC Center for Connected Multimodal Mobility led by Clemson University

Active Peer Reviewer

2018 ~ current
8. Journal of Safety Science
9. IEEE Transactions on Intelligent Vehicles

2017 ~ current
10. Journal of Accident Analysis and Prevention
11. Journal of Intelligent Transportation Systems
12. Advances in Civil Engineering Materials

2016 ~ current
13. Journal of Case Studies on Transportation Policies (CSTP)
14. Journal of Transportation Engineering, Part A: Systems

2015 ~ current
15. IEEE Transactions on Intelligent Transportation Systems
16. Journal of Advanced Transportation

2013 ~ current
17. Transportation Research Record- Journal of the Transportation Research Board (TRB)
18. Canadian Journal of Civil Engineering (CJCE)

Memberships

2012 ~ current
19. Institute of Transportation Engineers (ITE)
20. American Society of Civil Engineers (ASCE)

Honors and Awards

2021&2022
1. Award of Excellence for Outstanding Performance at Managing Federal Clients and Their Projects. Presented from Leidos, Inc.

2019
2. Best Paper Award on User Information Systems at the 99th Annual Meeting of the Transportation Research Board, Washington D.C.

2017
3. Honorable mention in the TRB AED50 committee's Kikuchi-Karlaftis Best Paper Award competition. Granted at the 96th Annual Meeting of the Transportation Research Board, Washington D.C.

2014
4. Troy H. Middleton Scholarship. Louisiana State University.
5. 1st Place Award for the best Research Poster Presentation at the 2014 CEE Graduate Student Research Conference. Louisiana State University.

2011 - 2015
6. CEE Enrichment Award for distinguished graduate students. Louisiana State University.

2006
7. Faculty of Engineering Graduation Prize for distinguished graduates (graduating with a general appreciation of Distinction with Honors.) Cairo University.
8. Soil Mechanics and Foundations Laboratory Award for highest grades in Soil Mechanics, Cairo University.

2003 - 2006
9. Civil Engineering Department Annual Award for Distinguished Undergraduate Students.

Graduate Students' Committees

University of Tennessee at Chattanooga

2022 – 2026
1. *Jamion Williams,* Doctoral Dissertation: De-Aggregated Node Inheritance via Combinatorial Elastic Network Enhancement (DANICE)

2021 – 2025
2. *Akintoye Oloko.* Doctoral Dissertation: Modeling and Testing of Vehicular and Communication Technology Impacts for Sustainable Operation of the Cyber-Physical Transportation System.

2021 – 2023
3. *Jewel Rana Palit:* Master Thesis: Developing an Advanced and Integrated Modeling Platform for Urban Planning and Smart City Applications.
4. *Faiza Khan:* Master Thesis: Algorithmic Development and Modeling for Energy-Efficient Cooperative Driving Automation.
5. *Jibril Babatunde.* Master Thesis: Adaptive and Cooperative Traffic Control Systems in the Era of Connected and Automated Vehicles.

2020
6. *Jeremiah Roland.* Master Thesis: How Negative Sampling Provides Class Balance to Rare Event Case Data Using a Vehicular Accident Prediction Project as a Use Case Scenario.

Texas A&M University

2018- 2020
7. Maryam Mousavi. Doctoral Dissertation: Examining the Effects of Non-Infrastructure Variables on the Safety Performance of Mixed Traffic Environments at Signalized Intersections.

Louisiana State University

2016 -
8. Matthew A. Theriot. Master Thesis: Impact of Connected Vehicle Safety

2017 Applications on Driving Behavior at Varying Market Penetrations: A Driving Simulator Study.

2016 9. Mengqiu Ye. Master Thesis: Driver Engagement in Secondary Tasks: Behavioral Analysis and Crash Risk Assessment.

Taught Courses

University of Tennessee at Chattanooga

2021 1. Transportation Engineering II (ENCE 4620)
- Role: Instructor of Record
- Level: Undergraduate
- Duties: Teaching various aspects that can help transportation engineers effectively understand the perspectives and economics of rural and urban transportation systems, as well as understand and analyze planning, design and operation aspects of highway, rail, and air facilities. Example topics include characteristics of road users, the vehicle and the road; human factors in transportation, transportation and traffic studies, traffic stream characteristics, intersection control, capacity analysis, and transportation planning and modeling.

2019-2020 2. Engineering Economy (ENCE 3520)
- Role: Instructor of Record
- Level: Undergraduate - General
- Duties: Teaching various aspects that can help engineers effectively identify the most feasible and economic solution among a set of solutions of an engineering problem. Example topics included economic decision making for engineering systems; choice of alternatives by equivalent annual cost, rate-of-return, present worth, and benefit-cost methods; tax influences, statistical decision making, replacement policy.

Louisiana State University

2018 &2016 3. Traffic Operations and Control (CE7610)
- Role: Instructor of Record
- Level: Graduate
- Duties: Teaching various aspects of design, operation, technology, and control in the field of Traffic Engineering. Example topics included introduction to connected vehicle technology, traffic stream components and characteristics, traffic flow theory, traffic simulation, and principles of intersection signalization.

2017 4. Principles of Highway and Traffic Engineering (CE3600)
- Role: Guest Instructor
- Level: Senior and Junior Undergraduate
- Duties: Teaching the vertical alignment, horizontal alignment, and traffic signal design.

2011 – 2012 5. Plane Surveying and Measurements (CE3500)
- Role: Teaching Assistant
- Level: Sophomore and Junior Undergraduate
- Duties: Preparation and execution of in-field sessions using several surveying instruments.

Cairo University

2006 – 2010
6. Highway Engineering (PBW401)
   - Role: Teaching Assistant
   - Level: Senior Undergraduate
   - Duties: Preparation and execution of hands-on sessions for principles of highway geometric and structural design.

2006 – 2010
7. Highway and Airports Engineering (PBW402)
   - Role: Teaching Assistant
   - Level: Senior Undergraduate
   - Duties: Preparation and execution of hands-on sessions for advanced principles of highway and airports geometric and structural design.

2006 – 2009
8. Transportation Planning and Traffic Engineering (PBW301)
   - Role: Teaching Assistant
   - Level: Junior Undergraduate
   - Duties: Preparation and execution of hands-on sessions for principles of traffic control and analysis.

2006 – 2008
9. Applied Statistics (CIV102)
   - Role: Teaching Assistant
   - Level: Freshmen Undergraduate
   - Duties: Preparation and execution of hands-on sessions for applications of statistics in civil engineering.
10. Plane Surveying (PBW101)
   - Role: Teaching Assistant
   - Level: Sophomore Undergraduate
   - Duties: Preparation and execution of in-field sessions using several surveying instruments.

Professional Development Workshops

Teaching

2019 *University of Tennessee at Chattanooga*
1. Applying the Quality Matters Rubric for Online and Blended Courses.

2018 *Virginia Polytechnic Institute and State University*
2. Course Design Clinic.
3. Designing Signature Assignments for Student Learning and Assessment.
4. Designing and Evaluating Student Presentation Assignments.
5. Project-Based Learning: Defining, Designing, and Applying.
6. Ideas for Creating a Positive Classroom Climate.
7. Transform Your Lectures with Presentation Techniques and Active Learning Strategies.
8. Teaching as Research: Building Your Scholarship of Teaching and Learning.

2016 *Louisiana State University*
9. Active Learning in Effective Classrooms

Research

2018 *Virginia Polytechnic Institute and State University*
1. Tools for Collaborative Research
2. Supercharge your Research Workflow with OSF Platform
3. Tracking Your Research Impact - Metrics, Tools, and Examples for Any Discipline

4. Communicating Your Research/Talking to the Public.
5. Collaborative Research 101 -- Exploring Team Science: the Science of Working Together Well.

Student Mentoring

2018 *Virginia Polytechnic Institute and State University*

1. How to Help Student Athletes Achieve their Academic and Athletic Potential.
2. How to Identify and Help Students in Distress.
3. Faculty Members and Student Mentoring: Teaching Beyond the Classroom.