Zubayer Islam

University: 12800 Pegasus Dr, STE 442D, Orlando, FL 32816, USA
zubayer_islam@knights.ucf.edu

I strive to use my experience of a multi-disciplinary background to contribute to teaching and research in smart cities.

ACADEMIC BACKGROUND

Aug 2018 – July 2021 **Ph.D. in Civil Engineering**, **UNIVERSITY OF CENTRAL FLORIDA, FL, USA**
Supervisor: Dr. Mohamed Abdel-Aty
Completed research projects relating the use of smartphone as OBU emulators, investigating smart sensors for garage monitoring system, real-time signal timing prediction based on detector information, smart intersection field study related to using recent sensing technologies at intersection

Aug 2018 – July 2020 **M.S. in Computer Science Engineering**, **UNIVERSITY OF CENTRAL FLORIDA, FL, USA**
Cumulative GPA of 3.66, completed projects involving path planning of vehicles in congested signal networks, DSRC-based communication scheme for merging vehicles on highway, reinforcement learning based projects, etc.

Feb 2013 – Sep 2017 **B.Sc. in Electrical and Electronic Engineering**, **BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA, BANGLADESH**
Completed with a cumulative GPA of 3.72, was involved in different robotics competition in which I oversaw both software and hardware interfaces.

EMPLOYMENT

Sep 2021 – present **Postdoctoral Scholar, UNIVERSITY OF CENTRAL FLORIDA, FL, USA**
Conduct research and development of signal timing predictions, smart intersection design, pedestrian behavior prediction, etc. as well as guide graduate students to produce articles for publishing in peer-reviewed journals.

Aug 2022 – present **Adjunct Faculty, UNIVERSITY OF CENTRAL FLORIDA, FL, USA**
Taught undergraduate course Introduction to Smart Cities as a part of the Future City initiative at UCF. Mentored 32 students, prepared slides, assignments, and rubric for overall assessment.

Aug 2018 – Aug 2021 **Graduate Research Assistant (GRA)**, **UNIVERSITY OF CENTRAL FLORIDA, FL, USA**
Built mobile and web-based applications for different projects, created specific traffic conditions in open-source simulation software, applied data mining techniques to different data sources

Dec 2017 – May 2018 **Software Engineer**, **MPOWER SOCIAL ENTERPRISES LTD, DHAKA, BANGLADESH**
Developed mobile (Android) and web-based applications, helped supervise the various production teams with their creative projects

RESEARCH INTEREST

Safety Analysis with artificial intelligence and machine learning including:

- real-time crash prediction,
- conflict prediction models with connected vehicle data,
- deep learning-based crash data augmentation algorithms, etc.

Mobility and sensing based applications such as

- Smart sensing, and Sensor fusion,
- IoT-based smart corridor platform,
- Signal phasing and timing (SPaT) prediction
- Cloud based online learning applications in transportation

TEACHING INTEREST

Introduction to Smart Cities, Data Science with Python, Algorithms for Smart City Applications, Smart Mobility, Sustainable Transportation

MENTORING EXPERIENCE

Served as a committee Member of 2 Ph.D. and 3 MS students, closely worked with several graduate and undergraduate students for several funded projects

PEER REVIEWED JOURNAL PUBLICATIONS (total 10)

2022 **Islam, Z.**, Abdel-Aty, M., & Mahmoud, N. (2022). Using CNN-LSTM to predict signal phasing and timing aided by High-Resolution detector data. *Transportation Research Part C: Emerging Technologies*, *141*, 103742.

2022 Anisha, A., Abdel-Aty, M., Abdelraouf, A., **Islam, Z.**, Zheng, O., Automated Vehicle to Vehicle Conflict Analysis at Signalized Intersections by Camera and LiDAR Sensor Fusion, *Transportation Research Record*

2022 Islam, M. R., Abdel-Aty, M., **Islam, Z.**, & Zhang, S. (2022). Risk-compensation trends in road safety during covid-19. *Sustainability*, *14*(9), 5057.

2021 **Islam, Z.**, Abdel-Aty, M., Cai, Q., & Yuan, J. Crash data augmentation using variational autoencoder. *Accident Analysis & Prevention, 151,* 105950.

2021 **Islam, Z.,** & Abdel-Aty, M. Sensor-Based Transportation Mode Recognition Using Variational Autoencoder. *Journal of Big Data Analytics in Transportation*, 1-12.

2021 **Islam, Z.**, & Abdel-Aty, M. Real-Time Vehicle Trajectory Estimation Based on Lane Change Detection using Smartphone Sensors. *Transportation Research Record*, 0361198121990681

2021 Li, P., Abdel-Aty, M., & **Islam, Z.** (2021). Driving Maneuvers Detection using Semi-Supervised Long Short-Term Memory and Smartphone Sensors. *Transportation Research Record*, 03611981211007483.

2020 Li, P., Abdel-Aty, M., Cai, Q., & **Islam, Z.** A Deep Learning Approach to Detect Real-Time Vehicle Maneuvers Based on Smartphone Sensors. *IEEE Transactions on Intelligent Transportation Systems.*

2017 **Islam, Z.,** & Islam, M. Z. Plasmonic solar cell with annular apertures and Ag grating supporting fabry-perot modes. *2017 IEEE International Conference on Telecommunications and Photonics (ICTP) (pp. 259-262).*

2017 Al-Hussaini, I., **Islam, Z.**, Mallick, A., & Hoque, M. E. Object recognition and real-time spoken word recognition using two-fold dynamic time warping for autonomous arm manipulator. *2017 IEEE International Conference on Signal and Image Processing Applications (ICSIPA) (pp. 236-240). IEEE*.

PEER REVIEWED CONFERENCE PAPERS (total 16)

2023 **Islam, Z.**, Abdel-Aty M., Goswamy, A., Abdelraouf, A., Zheng O., Modelling the Relationship Between Post Encroachment Time and Signal Timings Using UAV Video data, *Transportation Research Board Annual Meeting 2023*

2023 **Islam, Z.**, Abdel-Aty M., Islam, M. R., Anwari, N., Understanding the Impact of Vehicle Dynamics and Roadway Attributes on Surrogate Safety Measures Using Connected Vehicle Data, *Transportation Research Board Annual Meeting 2023*

2023 **Islam, Z.**, Abdel-Aty M., Ugan, J., Signal Phasing and Timing Prediction Using Connected Vehicle Data, *Transportation Research Board Annual Meeting 2023*

2023 Jahin, R. R., Abdel-Aty, M., **Islam, Z.**, Trajectory Prediction with Camera and Smartphone Data Fusion Using LSTM Network, *Transportation Research Board Annual Meeting 2023*

2023 Islam, M. R., Abdel-Aty, M., **Islam, Z.**, Where are we with Real-Time Safety Research? *Transportation Research Board Annual Meeting 2023*

2023 Islam, M. R., Abdel-Aty, M., **Islam, Z.**, Abdelraouf, A., A Real-time Framework to Predict Crash Likelihood and Cluster Crash Severity, *Transportation Research Board Annual Meeting 2023*

2022 **Islam, Z.**, Abdel-Aty M. Real-time Emergency Vehicle Event Detection Using Audio Data, *101st Transportation Research Board Annual Meeting 2022*

2022 **Islam, Z.**, Abdel-Aty M. Crash Data Augmentation Using Variational Autoencoder, *101st Transportation Research Board Annual Meeting 2022*

2022 Anisha, A., Abdel-Aty, M., Abdelraouf, A., Wu, Y., **Islam, Z.**, Zheng, O., Automated Vehicle to Vehicle Conflict Analysis at Signalized Intersections by Camera and LiDAR Sensor Fusion, *101st Transportation Research Board Annual Meeting 2022*

2021 **Islam, Z.**, Abdel-Aty, M. Sensor-based Transportation Mode Recognition Using Variational Autoencoder: Application of Smart Phone Data in the Context of P2V, *100th Transportation Research Board Annual Meeting 2021*

2021 Li, P., Abdel-Aty, M., Cai, Q., & **Islam, Z.** Driving Behavior Detection Using Semi-supervised LSTM and Smartphone Sensors, *100th Transportation Research Board Annual Meeting 2021*

2021 Rahman, Md. H., Abdel-Aty, M., Zaki, Mohamed H., **Islam, Z.** Evaluation of the Impact of Communication System on Traffic Safety under Connected and Automated Vehicles Environment, *100th Transportation Research Board Annual Meeting 2021*

2020 **Islam, Z.**, Abdel-Aty, M., Cai, Q., & Chowdhury, D. Using Smartphone Sensors to Estimate Vehicle Trajectories and Detect Lane Changes in the Context of Connected Vehicles, 99th *Transportation Research Board Annual Meeting 2020*

2020 Li, P., Abdel-Aty, M., Cai, Q., & **Islam, Z.** Real-time Vehicle Maneuvers Detection based on Smartphone Sensors and Deep Learning, 99th *Transportation Research Board Annual Meeting 2020*

2019 **Islam, Z.**, Abdel-Aty, M., Cai, Q., Chowdhury, D. & Ponnaluri, R. Using Smartphone Sensors to Estimate Vehicle Trajectories, *Florida Automated Vehicles Summit 2019*

2019 Li, P., Abdel-Aty, M., Cai, Q., & **Islam, Z.** Real-time Vehicle Maneuvers Detection based on Smartphone Sensors and Deep Learning, *Florida Automated Vehicles Summit 2019*

UNDER REVIEW (total 5)

2022 **Islam, Z.**, Abdel-Aty M. Traffic Conflict Prediction Using Connected Vehicles Probe Data, Under Review at *Analytical Methods in Accident Research*

2022 **Islam, Z.**, Abdel-Aty M. Deep Convolutional Neural Network for Roadway Incident Surveillance Using Audio Data, Under Review at *Transportation Research Part C: Emerging Technologies*

2022 Ugan, J**.,** Abdel-Aty M., **Islam, Z.** Using Connected Vehicle Trajectory Data to Evaluate the Effects of Speeding, Under Review at *IEEE Transactions on Intelligent Transportation Systems*

2022 **Islam, Z.**, Abdel-Aty M. Real-time Emergency Vehicle Event Detection Using Audio Data, Under Review at *Journal of Big Data Analytics in Transportation*

2022 Goswamy, A., Abdel-Aty, M., **Islam, Z.**, Factors Affecting Injury Severity at Pedestrian Crossing Locations with Rectangular Rapid Flashing Beacons (RRFB) using XGBoost and Random Parameters Discrete Choice Models, Under Review at *Accident Analysis and Prevention*

RESEARCH PROJECTS

2018 Using Smartphone as On-board unit (OBU) Emulator Implementation Study, Funded by Florida Department of Transportation (FDOT) BDV24-977-30, Role: Graduate Research Assistant

2020	Connecting the East Orlando Communities Project- Phase I, Role: Graduate Research Assistant
2020	Phase III - ATTAIN: Intersection Signal Prediction and Corridor Traffic Management Based on Big-Data Analytics and Cutting Edge Technologies, Funded by Florida Department of Transportation (FDOT) BDV24 562-10, Role: Project Leader and Senior Member
2021	Phase I: Before Study Evaluation of Interstate 4 (I-4) Florida's Regional Advanced Mobility Elements (FRAME) Project (Before Analysis), Funded by Florida Department of Transportation (FDOT), Role: Senior Member
2022	Smart Orlando Downtown Advanced Traffic Operations Performance, Funded by Florida Department of Transportation (FDOT), Role: Project Leader and Senior Member
2022	Optimization of Signal timing based on Pedestrian Intervals Using Computer Vision and Deep Learning Technology, Funded by Florida Department of Transportation (FDOT), Role: Project Leader

AWARDS AND RECOGNITION

2021	UCF 2021 Preeminent Postdoctoral Program (P3) award, offered by the College of Graduate Studies for outstanding postdoctoral scholars
2018	ORC Doctoral Fellowship, awarded by the College of Graduate Studies at University of Central Florida
2019, 2020	RTSS Student Travel Grant, awarded to participate in TRB Annual Meeting
2020	UCF Graduate Presentation Fellowship, awarded for presenting at TRB Annual Meeting
2015	Runners Up at inter-university robotics competition organized by CSE department, BUET
2008	Board Merit Scholarship, awarded for outstanding results in national scholarship examination

PROFESSIONAL SERVICES

Reviewer	Accident Analysis and Prevention (AAP)
Reviewer	Analytical Methods in Accident Research (AMAR)
Reviewer	IEEE International Conference on Intelligent Transportation Systems
Reviewer	Journal of Advanced Transportation
Reviewer	Transportation Research Record (TRR)
Reviewer	Transportation Research Board (TRB) Annual Meeting
Reviewer	Journal of Electrical and Computer Engineering
Reviewer	Scientific Reports
Judge	UCF Senior Design Showcase 2021

PROFESSIONAL MEMBERSHIPS

Member	IEEE, Orlando Section
Friend	Standing Committee on Intelligent Transportation Systems, ACP 15
Friend	Standing Committee on Transportation Safety Management Systems, ACS 10
Friend	Standing Committee on Artificial Intelligence and Advanced Computing Applications, AED 50
Friend	Standing Committee on Data for Decision Making, AJE70