Mahdi Razzaghpour   Homepage   LinkedIn   Google Scholar   Email: razzaghpour.mahdi@gmail.com

INTERESTS	**Deep Reinforcement Learning	Multi-agent Systems	Cooperative Driving & Connectivity**

EDUCATION

- **Ph.D. Computer Engineering, University of Central Florida**   (GPA: 4/4)   (2019-present)
  - Advisor: Dr. Yaser P. Fallah
  - Major: Intelligent Systems and Machine Learning (ISML)
  - Research: Reinforcement Learning | Cooperative Driving & Connectivity | Machine Learning

- **M.Sc. Computer Engineering, University of Central Florida**   (GPA: 4/4)   (2019-2021)
  - Advisor: Dr. Yaser P. Fallah
  - Major: Intelligent Systems and Machine Learning (ISML)
  - Research: Cooperative Driving & Connectivity

- **B.Sc. Electrical Engineering, Sharif University of Technology**   (GPA: 3.23/4)   (2014-2019)
  - Major: Communications
  - Thesis: Distributed Learning in Mobile Wireless Sensor Networks

WORK EXPERIENCE

- **Cooperative Deep Reinforcement Learning for Autonomous and Assistive Driving**
  - Investigating the problem of multi-agent maneuver-level decision-making in mixed-autonomy environments and how AVs can learn cooperative policies by incorporating an information-theoretic model of human decision-making in an RL setting for safe and efficient operations
  - Our altruistic AVs learn the decision-making process from experience, considering the interests of all vehicles while prioritizing safety and optimizing a general decentralized social utility function

- **Perceptive Stochastic Coordination in Mass Platoons of Automated Vehicles**
  - This research's goal is to test the limits of the coordinated operation of a large network of CAVs in a mixed environment of manned and automated vehicles
  - We investigated the performance of the vehicle platoon with various information flow topologies, showing that using information from multiple predecessors can cancel shock waves very effectively

- **Multi-resolution Model and Context-aware Information Networking for Cooperative Vehicle Efficiency and Safety Systems**
  - Proposing a network-aware error-driven content selection technique to piggyback the more important information to the receiving vehicles
  - The proposed method enables safety applications to operate on the context-aware map rather than individual information messages, reducing the impact of packet loss on safety application performance

- **C-V2X MAC Layer Analysis for Deployment on CAVs**
  - Investigation of various V2I communication strategies, particularly in the context of a transaction
  - Based on the C-V2X protocol, we present an application-oriented analysis of various aspects of a transaction service using both network-oriented and user-centric metrics

SKILLS

- **Software:** Python (+TensorFlow, Keras, PyTorch, OpenCV, OpenAI Gym), C/C++, R, MATLAB (+Simulink), Git, ROS, CARLA & SUMO Simulators, Agile Software Development
- **Technical Skills:** Experienced in CAVs' sensory devices. Strong hands-on skills in product design, prototyping, and test engineering

RELEVANT COURSES

- **AI/ML**: Machine Learning, Artificial Intelligence, Fuzzy Systems
- **Vision**: Computer Vision, Image Processing, 3D Computer Vision
- **Mathematics**: Probability & Random Process, Statistical Inference, Linear Algebra, Optimization
- **Communication**: Communication Systems, Signal Processing, Wireless Communication
- **Udacity**: Self-driving Car Engineer Nano-degree, Sensor Fusion Engineer Nano-degree
- **Qualcomm Wireless Academy**: 5G NR Technical Training

HONORS AND AWARDS	
	• **University of Central Florida David T. and Jane Donaldson Scholarship** (2021)
	• **University of Central Florida Presentation Fellowship** (2020)
	• **University of Central Florida ORC Doctoral Fellowship Recipient** (2019)

SELECTED PUBLICATIONS

- **Conferences**
  - Mahdi Razzaghpour, Sahand Mosharafian, Arash Raftari, Javad Mohammadpour Velni, Yaser P. Fallah "Impact of Information Flow Topology on Safety of Tightly-coupled Connected and Automated Vehicle Platoons Utilizing Stochastic Control", *2022 European Control Conference (ECC 2022, Invited Paper)*
  - Mahdi Razzaghpour, Adwait Datar, Daniel Schneider, Mahdi Zaman, Herbert Werner, Hannes Frey, Javad Mohammadpour Velni, Yaser P. Fallah "Finite State Markov Modeling of C-V2X Erasure Links For Performance and Stability Analysis of Platooning Applications", *2022 IEEE International Systems Conference (SysCon 2022)*
  - Mahdi Razzaghpour, Shahriar Shahram, Rodolfo Valiente, Yaser P. Fallah "Impact of Communication Loss on MPC based Cooperative Adaptive Cruise Control and Platooning", *2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall)*
  - Mahdi Zaman, Md Saifuddin, Mahdi Razzaghpour, Yaser P. Fallah "Performance Analysis of V2I Zone Activation and Scalability for C-V2X Transactional Services", *2022 IEEE 96th Vehicular Technology Conference (VTC2022-Fall)*
  - Sahand Mosharafian, Mahdi Razzaghpour, Yaser P. Fallah, Javad Mohammadpour Velni "Gaussian Process based Stochastic Model Predictive Control for Cooperative Adaptive Cruise Control", *2021 IEEE Vehicular Networking Conference (VNC 2021)*
  - Behrad Toghi, Divas Grover, Mahdi Razzaghpour, Rajat Jain, Rodolfo Valiente, Mahdi Zaman, Ghayoor Shah, Yaser P. Fallah "A Maneuver-based Urban Driving Dataset and Model for Cooperative Vehicle Applications", *2020 IEEE 3rd Connected and Automated Vehicles Symposium (CAVS 2020)*

- **Journals**
  - Rodolfo Valiente, Mahdi Razzaghpour, Behrad Toghi, Ghayoor Shah, Yaser P. Fallah "Prediction-aware and Reinforcement Learning based Altruistic Cooperative Driving", *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*
  - Ahura Jami, Mahdi Razzaghpour, Hussein Alnuweiri, Yaser P. Fallah "Augmented Driver Behavior Models for High-Fidelity Simulation Study of Crash Detection Algorithms", *Intelligent Transport Systems (IET)*
  - Rodolfo Valiente, Arash Raftari, Hossein Nourkhiz Mahjoub, Mahdi Razzaghpour, Syed K Mahmud, Yaser P. Fallah "Context-Aware Target Classification with Hybrid Gaussian Process prediction for Cooperative Vehicle Safety systems", *Intelligent Transport Systems (IET)*
  - Babak Ebrahimi Soorchaei, Mahdi Razzaghpour, Rodolfo Valiente, Arash Raftari, Yaser P. Fallah "High-Definition Map Representation Techniques for Automated Vehicles", *Electrical and Autonomous Vehicles (MDPI)*

- **Book Chapters**
  - Rodolfo Valiente, Behrad Toghi, Mahdi Razzaghpour, Ramtin Pedarsani, Yaser P. Fallah "Learning-based social coordination to improve safety and robustness of cooperative autonomous vehicles in mixed traffic", *Machine Learning and Optimization Techniques for Automotive Cyber-Physical Systems, 2022,(Springer)*

VOLUNTEER WORK

- Member of Institute of Electrical and Electronics Engineers (IEEE)
- Reviewer for the IEEE Transactions on Vehicular Technology (TVT), IEEE Vehicular Technology Conference (VTC)
- **Other Activities:** Mountaineering, Hiking, Swimming, Reading (Novel, Philosophy, history, . . .)

REFERENCES

Dr. Yaser P. Fallah	**Dr. Javad M. Velni**	**Dr. Jayanthi Rao**
Associate Professor	Associate Professor	Advanced Connectivity Technologies
University of Central Florida	University of Georgia	Ford Motor Company
(yaser.fallah@ucf.edu)	(javadm@uga.edu)	(jrao1@ford.com)