ALI ROSTAMI

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OVERVIEW

- 8+ years of research experience in the area of **wireless systems**.
- 5+ years of research/engineering experience in the area of **connected vehicles systems**.
- 2+ years of leading WINLAB team in multiple projects under CAMP and NHTSA.

EDUCATION

Rutgers University *Sep. 2013 - Present*
Ph.D. in Computer Engineering, Electrical and Computer Engineering Department
Proposal: "Context-Aware Congestion Control for Pedestrian Safety Communication"
Expected Graduation Date: September 2019

Rutgers University *Sep. 2013 - Oct. 2016*
MS in Computer Engineering, Electrical and Computer Engineering Department
Thesis: "Channel Congestion Control in Vehicular Networks: Stability Challenges"

COURSE WORK

Programming Courses: Software Engineering; Data Structure and Algorithms; Software Engineering:Web Applications; Communication Networks; Computer Vision.

Networking Courses: Mobile Computing and Wireless Networks; Distributed Systems; Fault-Tolerant System Design; Performance Evaluation of Computer Networks.

SELECTED PUBLICATIONS

- Stability Challenge and Enhancement for Vehicular Channel Congestion Control Approaches. **Ali Rostami**, Bin Cheng, Gaurav Bansal, Katrin Sjoberg, Marco Gruteser, and John B. Kenney. IEEE Transactions on Intelligent Transportation Systems, 2016.
- Experience: Accurate Simulation of Dense Scenarios with Hundreds of Vehicular Transmitters. Bin Cheng, **Ali Rostami**, and Marco Gruteser. In Proceedings of 22^{nd} Annual International Conference on Mobile Computing and Networking (MobiCom), 2016.
- Reducing Unnecessary Pedestrian-to-Vehicle Transmissions Using a Contextual Policy. **Ali Rostami**, Bin Cheng, Hongsheng Lu, Marco Gruteser, and John B. Kenney. In Proceedings of Workshop of CarSys at ACM MobiCom, 2017.
- Performance and Channel Load Evaluation for Contextual Pedestrian-to-Vehicle Transmissions. **Ali Rostami**, Bin Cheng, Hongsheng Lu, John B. Kenney, and Marco Gruteser. In Proceedings of Workshop of CarSys at ACM MobiCom, 2016.
- Repeatability of Vehicular Measurements on Public Roadways. Ines Ugalde, Bin Cheng, **Ali Rostami**, Marco Gruteser, and Syed Amaar Ahmad. In Proceedings of Workshop of WiNTECH at ACM MobiCom, 2017.
- Impact of 5.9 GHz Spectrum Sharing on DSRC Performance. Bin Cheng, Hongsheng Lu, **Ali Rostami**, Marco Gruteser, and John B. Kenney. IEEE Vehicular Networking Conference (VNC), 2017. *In press.*

· Evolution of Vehicular Congestion Control Without Degrading Legacy Vehicle Performance. Bin Cheng, **Ali Rostami**, Marco Gruteser, Hongsheng Lu, John B. Kenney and Gaurav Bansal. In Proceedings of Workshop of Smart Vehicles at IEEE WoWMoM, 2016.

SKILLS

Programming & Scripting Languages	*Proficient*: C++, Perl, AWK, MATLAB *Familiar*: Java, Python, C#
Network Simulators	*Expert*: ns3, ns2 *Familiar*: OPNet, GloMoSim
Databases	*Familiar*: MySQL, Microsoft SQL
Tools and Other Simulator	*Expert*: Simulation of Urban Mobility (SUMO), Git *Familiar*: CPN-Tools (Colored Petri Net modeling and analyzing tool)

LATEST EXPERIENCES

General Motors
Connected Vehicles Systems May 2017 - August 2017

· Evaluated the SAE J2945/1 congestion control algorithm for different vehicular traffic scenarios.
· Designed and implemented unit test procedures in C++ for Vehicle-to-Vehicle (V2V) network simulator.
· Implemented an efficient metric calculation tool for V2V congestion control performance evaluation. The code leveraged matrix calculation and reduced run time by ≈80%.

WINLAB, Rutgers University
Connected Vehicles Systems November 2013 - Present

· Co-designed large-scale V2V field experiments with tens of vehicles equipped with DSRC transceivers.
· Improved scalability of the simulator by evolving core components such as node and mobility classes by significantly reducing memory usage using dynamic node object allocation.
· Improved accuracy of simulation results by adding extra features to the node class, enabling more realistic simulation scenarios with thousands of simulation nodes.
· Significantly reduced run time for complex channel propagation models using acceptable approximation.
· Calibrated the resulting channel propagation loss models using offline machine learning techniques.
· Validated the calibration by the state-of-the-art cross-validation techniques, using field experiment data.
· Contributed several open-source components for V2V simulation to the ns-3 simulator community.

Context-Aware Pedestrian-to-Vehicle Communication September 2015 - Present

· Studied, analyzed, and simulated pedestrian movements around Times Square, New York City.
· Introduced several contextual safety message trigger policies for future DSRC-based pedestrian safety systems, to optimize narrow-band wireless channel allocation.
· Modeled, implemented, and calibrated GPS error on smartphones in city canyons using time-series.
· Introduced a new collaborative channel measurement to reduce energy consumption in smartphones.

Sensor Data Sharing and Fusion in Autonomous Vehicles Systems Jan 2019 - Present

· Designed a system where cars share their camera feed in a form of 3D point clouds of detected objects with nearby cars on the road in real-time.
· Co-designed an algorithm to fuse the received point clouds from nearby cars with local feed to increase visibility and confidence of detected objects.
· Co-designed metrics for performance evaluation of such collaborative self-driving systems.
· Co-designed a mechanism to leverage available GPS information to maximize the confidence score of the detection.

5.9 GHz Band Spectrum Sharing September 2016 - November 2017

- Compared Detect & Vacate (D&V), and Detect & Mitigate (D&M) approaches for scenarios where driving safety applications of V2V share a 10 MHz communication channel with Wi-Fi.
- Studied, analyzed and compared the popular spectrum sharing techniques such as Listen Before Talk (LBT) and Dynamic Spectrum Sharing (DSS).
- Proposed solutions to improve D&V and D&M algorithms for the so-called delayed detection problem.

European Decentralized Congestion Control Project November 2013 - April 2016

- Designed, implemented and validated the European Decentralized Congestion Control (DCC) Mechanism in Network Simulator 2 (ns-2).
- Implemented and validated Cooperative Awareness Message (CAM) generation algorithm.
- Evaluated the European DCC in terms of stability of the algorithm, and further compared it with LIMERIC – a candidate congestion control algorithms for deploying across the United States.
- Analyzed the channel load instability caused by the European DCC and provided alternative stable designs.

mmWave Communication in Vehicular Environment November 2017 - March 2019

- *Unpublished works.*

Personal Project: Enabling DSRC on an Off-the-Shelf Smartphone Jan. 2017 - May 2017

- Modified Android's MAC layer to support IEEE 802.11p protocol by patching Offset Codebook (OCB) mode to IEEE 802.11ac.

RESEARCH INTERESTS

- Wireless Communication and Systems.
- Connected Vehicles Systems and Autonomous Vehicles.
- Applied Machine Learning.
- Cross-Layer Design and Optimization.

PROFESSIONAL SERVICES

- **Journal Reviewer**: IEEE Transactions on Vehicular Technology (TVT), IEEE Transactions on Intelligent Transportation Systems (T-ITS), IEEE Transactions on Mobile Computing, IEEE Intelligent Transportation Systems Magazine (ITSM), Computer Communications (COMCOM) Journal, IEEE Vehicular Technology Magazine, IEEE Communications Letters.
- **Organizing Committee Member**: ACM MobiCom 2017

TEACHING EXPERIENCES

Teaching Assistant:

- Network-Centric Programming, Spring 2014
- Communication and Computer Networks, Fall 2014
- Digital Logic Design, Fall 2015
- Software Engineering, Spring 2017