

# Muhammad Awais Javed

---

Room 316, Electrical Engineering Department  
COMSATS University Islamabad  
Islamabad, Pakistan  
Email: md.awaisjaved@gmail.com, awais.javed@comsats.edu.pk  
Web: <https://sites.google.com/site/mdawaisjaved/>

## Research Experience

*Postdoc Research Scientist* July 2015-June 2016  
Qatar Mobility Innovations Center (QMIC), Doha, Qatar  
<https://www.qmic.com>

- The work involved working on the SafeITS project (<https://www.safeits.org>) funded by the Qatar National Research Foundation (QNRF) within the 7th cycle of the National Priorities Research Program (NPRP). The project was jointly conducted at QMIC (the first independent innovations center in the Gulf region with a focus on developing and deploying smart mobility systems and services) located in Doha Qatar, Western Michigan University located in Kalamazoo, Michigan, United States; and Purdue University located in West Lafayette, Indiana, United States.

The main goal of the project was to develop an adaptive security framework for secure and safe ITS applications. To address this task, we first analysed the security and functional requirements of ITS communication systems followed by road safety application and use cases. We also performed extensive experimental benchmarking of ITS security services in realistic operating conditions. Finally, we designed innovative ITS application framework for the dynamic monitoring and adaption of the security, performance and safety features, to cope with changes in applications/user needs and/or contexts.

*Ph.D. Researcher* Nov. 2010-Feb.2015  
The University of Newcastle, Australia

- Vehicular ad hoc network relies on the information exchange via inter-vehicle communication to provide vehicles with a neighborhood view for safety purposes as well as other traffic management and infotainment applications. Using the VANET architecture, a multi-service ad hoc network could be developed by employing packet broadcast techniques. A multiservice ad hoc network imposes stringent packet transmission requirements for most traffic types, introducing number of challenges such as packet collisions due to hidden nodes, multi-path fading and the packet broadcast storm.

This research work proposes several efficient multi-service packet transmission techniques that have been developed and evaluated for future road traffic applications in VANETs. Specifically, for safety applications, power and rate control techniques have been developed using new QoS metrics. To efficiently transmit periodic safety messages, an adaptive space division multiple access technique has been developed that solves bandwidth under-utilization problem of SDMA techniques. Moreover, a time-slotted multi-hop broadcast technique has been developed for efficient dissemination of emergency warning messages. Finally, techniques for transmission of multimedia packets and support an electric vehicle information system have been proposed.

## EDUCATION

*Ph.D. in Electrical Engineering* Nov. 2010-Feb. 2015

The University of Newcastle, Australia  
Thesis: "Multi-Service Packet Transmission Techniques to Support Future Road Traffic Applications in VANETs"  
Supervisor: Dr. Jamil Yusuf Khan

*B.Sc in Electrical Engineering* Sep. 2004-Aug.2008  
University of Engineering and Technology, Lahore, Pakistan  
GPA: 86.43/100  
Thesis: "Design and Implementation of a VoIP using wireless LAN"  
Supervisor: Dr. Noor Muhammad Sheikh

- Voice over IP provides a mechanism for audio communications and sharing of other multi-media services using the internet. In this thesis, the objective is to design a voice over IP network that can connect the laboratories of electrical engineering department using the wireless LAN. The user initiates an audio call using the telephone set and the destination laboratory phone number assigned by the server. The telephone set is connected to the computer using specially designed hardware. The session initiation protocol and user interface is implemented using JAVA programming language.

*F.Sc. Pre-Engineering* Aug. 2002-Aug.2004  
Islamabad Model College For Boys, G-10/4 Islamabad, Pakistan  
GPA: 85.27/100

## HONOURS AND AWARDS

- University of Newcastle International Postgraduate Research Scholarship 2010-2014
- University of Newcastle Tuition Fee Scholarship 2010-2014
- IEEE student travel grant to attend ATNAC 2011, Melbourne, Australia Nov. 2011
- University of Newcastle travel grant to attend VTC 2013, Dresden, Germany Jun. 2013
- University of Newcastle travel grant to attend ICSPCS 2013, Gold Coast, Australia Dec. 2013
- University of Newcastle travel grant to attend VTC 2014, Seoul, South Korea May. 2014
- First position in F.Sc in College, Rank 1/200 Aug. 2004

## WORK EXPERIENCE

*Assistant Professor* Mar. 2015-Present  
Department of Electrical Engineering  
COMSATS University Islamabad, Pakistan  
Web: <https://www.comsats.edu.pk>

- My major responsibility is to teach undergraduate & graduate level courses to the students of Electrical Engineering Department. Moreover, I conduct research in the area of networks and communications. Additionally, I am also manage documentation related to Pakistan Engineering Council. I also perform duties as an ISO auditor, conducting university audits as per ISO 9001:2015 standard and also managing departmental documentation that are in compliance with ISO 9001:2015 standard. Till now, I have taught the following courses.  
ETN 676, Internetworking: Architectures, Protocols and Applications (Graduate) Fall-2018  
EEE 351, Principles of Communication Systems (Under graduate) Fall-2018

ETN 673, Graph Theory and Network Optimization (Graduate)	Spring-2018
EEE 232, Electronics-II (Under graduate)	Spring-2018
ETN 676, Internetworking: Architectures, Protocols and Applications (Graduate)	Fall-2017
EEE 351, Principles of Communication Systems (Under graduate)	Fall-2017
ETN 676, Internetworking: Architectures, Protocols and Applications (Graduate)	Spring -2017
EEE 232, Electronics-II (Under graduate)	Spring -2017
EEE 314, Data Communications and Networks (Under graduate)	Fall -2016
EEE 314, Data Communications and Networks (Under graduate)	Fall -2016
EEE 222, Electric Circuit Analysis-II (Under graduate)	Spring -2015
EEE 232, Electronics-II (Under graduate)	Spring -2015

*Postdoc Research Scientist* July 2015-June 2016  
 Qatar Mobility Innovations Center (QMIC), Doha, Qatar  
 Web: <https://www.qmic.com>

*Research Assistant* May. 2014-Dec. 2014  
 School of Electrical Engineering and Computer Science  
 The University of Newcastle, Callaghan, Australia  
 Web: <http://www.newcastle.edu.au>

- The work involved working on the communication algorithms for Smart Cities project. Specifically, I worked on the development and analysis of algorithms related to WiFi, 3G/4G and 6LoWPAN wireless technologies using C/C++ programming in OPNET simulator.

*Lab Tutor/ Teaching Assistant*  
 School of Electrical Engineering and Computer Science  
 The University of Newcastle, Callaghan, Australia

ELEC 3550, Wireless communications	Fall-2011, 2012, 2013
ELEC 3540, Analog and Digital Communications	Spring-2014

- The work involves conducting lab sessions of the above undergraduate engineering subjects, setting up the hardware for the lab, making manuals related to labs and marking of lab assignments.

*Research Associate* Jan. 2010-Feb.2015  
 Department of Electrical Engineering  
 COMSATS Institute of Information & Technology, Islamabad

EEN-101, Electric Machines	Spring & Fall-2010
----------------------------	--------------------

- The work includes conducting lab sessions of the above undergraduate engineering subjects, making manuals related to labs, up gradation of labs and marking of lab assignments.

*Lab Engineer* Sep. 2008-Jan.2010  
 Department of Computer Science and Engineering

Bahria University E-8, Islamabad, Pakistan  
Web: <https://www.bahria.edu.pk>

EEN-101, Linear Circuit Analysis	Fall-2008
TCN-450, Wireless Communications	Spring-2009
SEL-217, Data Structures & Algorithms	Spring-2009
TCN-447, Wave Propagation and Antennas	Fall-2009
ECN-424, Digital Electronics	Fall-2009

- The work includes conducting lab sessions of the above undergraduate engineering subjects, making manuals related to labs, up gradation of labs and marking of lab assignments.

*Internee* Jul. 2007-Aug.2007  
NSS Department at UFONE GSM

- The work includes hands on experience on the system used in networking switching subsystem department in the mobile operator company. The experience also involves troubleshooting connectivity problems of the customers and management of backbone telecommunication network.

## RESEARCH INTERESTS

- Intelligent Transportation System (ITS)
- Data dissemination in Vehicular Ad hoc Networks
- MAC and network layer protocols for Ad hoc networks
- Scheduling algorithms for emerging wireless technologies
- Wireless Network Security of future wireless technologies
- Energy efficient green communications
- Data Analytics and Machine Learning
- Performance evaluation and analysis of communication systems

## LIST OF PUBLICATIONS

### Patents

- [P1] E. B. Hamida, and **M. A. Javed** “Methods and Systems for Prioritized Authentication between Mobile Objects ”, QMIC, US Patent Application No.: 15218105, July 25, 2016.

### Book Chapter

- [B1] **M. A. Javed**, J. Y. Khan, and D. T. Ngo “A VANET Based Electric Vehicle Energy Management Information System”, in Energy Management in Wireless Cellular and Ad-hoc Networks, pp. 319-338, Springer International Publishing, 2016, ISBN:978-3-319-27568-0.
- [B2] **M. A. Javed**, D. T. Ngo and J. Y. Khan, “Cooperative Communications for emergency multi-media services in VANETs”, in Multimedia Over Cognitive Radio Networks: Algorithms, Protocols, and Experiments, pp. 319-338, Taylor & Francis LLC, CRC Press, 2014, ISBN: 9781482214857.

### Refereed Journal Articles (Total Impact Factor: **64.736**)

- [J1] **M. A. Javed**, Sherali Zeadally, Elyes Ben Hamida “Data Analytics for Cooperative Intelligent Transport Systems, Vehicular Communications, to appear, 2019 ((**IF: 3.289**)).
- [J2] B. Omoniwa, R. Hussain, **M. A. Javed**, S. Bouk, S. Malik, “Fog/Edge Computing-based IoT (FECIoT): Architecture, Applications, and Research Issues, IEEE Internet of Things Journal, to appear, 2019 (**IF: 5.863**)).

- [J3] **M. A. Javed**, Sherali Zeadally “RepGuide: Reputation-based Route Guidance using Internet of Vehicles”, IEEE Communications Standards Magazine, to appear, 2018.
- [J4] F. Jameel, **M. A. Javed**, “ On the Performance of Cooperative Vehicular Networks under Antenna Correlation at RSU”, AEU - International Journal of Electronics and Communications, vol. 95, October 2018, pp. 216-225, 2018 (**IF: 2.115**).
- [J5] F. Jameel, S. Wyne, **M. A. Javed**, S. Zeadally, “Interference-aided Vehicular Networks: Future Research Opportunities and Challenges”, IEEE Communications Magazine, vol. 56, no. 10, October 2018, pp. 36-42, 2018 (**IF: 9.270**).
- [J6] F. Jameel, Z. Hamid, F. Jabeen, S. Zeadally, **M. A. Javed**, “A Survey of Device-to-Device Communications: Research Issues and Challenges”, IEEE Communications Surveys and Tutorials, vol. 20, no. 3, pp. 2133-2168, 2018 (**IF: 20.230**).
- [J7] **M. A. Javed**, Sherali Zeadally, Zara Hamid, “Trust-based Security Adaptation Mechanism for Vehicular Sensor Networks”, Computer Networks, vol. 137, pp. 27-36, 2018 (**IF: 2.522**).
- [J8] F. Jameel, **M. A. Javed**, Dushantha Nalin K. Jayakody, Syed Ali Hassan, “On Secrecy Performance of Industrial Internet of Things (IIoT)”, Internet Technology Letters, vol. 1, no. 2, 2018.
- [J9] F. Jameel, Z. Hamid, F. Jabeen, and **M. A. Javed**, “Impact of Co-Channel Interference on the Performance of VANETs under  $\alpha - \mu$  fading”, AEUE - International Journal of Electronics and Communications, vol. 83, pp. 263-269, 2018 (**IF: 2.115**).
- [J10] M. Waqas, G.Sidhu, T. Jabeen, and **M. A. Javed**, “A Transmit Power Optimization for Relay Aided Multi-Carrier D2D Communication”, to appear in IEEE Tsinghua Science and Technology, 2017 (**IF: 1.365**).
- [J11] **M. A. Javed**, E. B. Hamida, Ala-Al Fuqaha, Bharat Bhargava, “Adaptive Security for Intelligent Transport Systems”, to appear in IEEE Intelligent Transport Systems Magazine, 2017 (**IF: 3.564**).
- [J12] **M. A. Javed**, Sherali Zeadally, Muhammad Usman, and Guftaar Ahmad, “FASPM: Fuzzy Logic-based Adaptive Security Protocol for Multi-hop Data Dissemination in Intelligent Transport Systems”, to appear in Transactions on Emerging Telecommunications Technologies, 2017 (**IF: 1.535**).
- [J13] **M. A. Javed**, and E. B. Hamida, “On the Interrelation of Security, QoS and Safety in Cooperative ITS”, IEEE Transactions on Intelligent Transport Systems, vol. 18, no. 7, pp. 1943-1957, 2017 (**IF: 3.724**).
- [J14] E. B. Hamida, **M. A. Javed** and W. Znaidi, “Adaptive Network Security Provisioning for Vehicular Safety Applications”, International Journal of Space-Based and Situated Computing, vol. 7, no. 1, pp. 16-31, 2017.
- [J15] **M. A. Javed**, E. B. Hamida, and W. Znaidi, “Security in Intelligent Transport Systems for Smart Cities: From Theory to Practice”, Sensors, Special Issue on Security and Privacy in Sensor Networks, vol. 16, issue. 6, no. 879, 2016 (**IF: 2.677**).
- [J16] **M. A. Javed**, D. T. Ngo and J. Y. Khan, “A Multi-hop Broadcast Protocol Design for Emergency Warning Notification in VANETs”, EURASIP Journal on Wireless Communications and Networking, 2014-179 (**IF: 1.529**)[**Marked as highly accessed article**].
- [J17] **M. A. Javed**, D. T. Ngo and J. Y. Khan, “Distributed Spatial Reuse Distance Control for Basic Safety Messages in SDMA-Based VANETs”, Elsevier Vehicular Communications, vol. 2, pp. 27-35, 2015 (**IF: 5.108**).
- [J18] **M. A. Javed** and J. Y. Khan, “An Efficient Data Dissemination Scheme for Warning Messages in Vehicular Ad Hoc Networks”, International Journal of

### Refereed Conference Papers

- [C1] Noor ul Husnain Lodhi, Aiman Malik, Talha Zulfiqar, **M. A. Javed**, Nazmus Shaker Nafi, “ Performance Evaluation of Wi-Fi Finger Printing Based Indoor Positioning System, IEEE Conference on Wireless Sensors (ICWiSE 2018), Langkawi, Malaysia, November 2018, p.p 1-6.
- [C2] Aiza Asif, Urooj Zahra, Muhammad Ahmed, Muhammad Faisal Siddiqui, **M. A. Javed**, “ FPGA based Implementation of ECDSA for Secured ITS”, IEEE Computer Science and Electronic Engineering (CEEC 2018), Essex, United Kingdom, September 2018, p.p 1-6.
- [C3] Abdullah Numani, Syed Junaid Nawaz, **M. A. Javed**, “Architecture and Routing Protocols for Airborne Internet Access”, IEEE/IEIE International Conference on Consumer Electronics (ICCE-Asia 2018), Jeju, South Korea, June 2018, p.p 1-6.
- [C4] Omar Darwish, Ala Al-Fuqaha, Ghassen Ben Brahim, **M. A. Javed**, “Using MapReduce and Hierarchical Entropy Analysis to Speed-Up the Detection of Covert Timing Channels”, IEEE International Conference on Wireless Communications and Mobile Computing (IWCMC 2017), Valencia, Spain, June 2017, p.p 1-6.
- [C5] **M. A. Javed**, and E. B. Hamida, “Adaptive Security Mechanisms for Safety applications in Internet of Vehicle”, IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob 2016), New York, United States, October 2016, p.p 1-6.
- [C6] **M. A. Javed**, and E. B. Hamida, “How Data Analytics will Drive Future Road Safety Applications”, Machine Learning and Data Analytics Symposium (MLDAS 2016), Doha, Qatar, March 2016, p.p 1-4.
- [C7] E. B. Hamida, and **M. A. Javed**, “Securing the Internet of Vehicles: Machine Learning to the Rescue”, Machine Learning and Data Analytics Symposium (MLDAS 2016), Doha, Qatar, March 2016, p.p 1-4.
- [C8] **M. A. Javed**, and E. B. Hamida, “Novel Vehicle Awareness Measure for Secure Road Traffic Safety Applications”, Qatar Foundation Annual Research Conference (ARC 2016), Doha, Qatar, March 2016, p.p 1-5.
- [C9] E. B. Hamida, and **M. A. Javed**, “Channel-Aware ECDSA Signature Verification of Basic Safety Messages with K-Means Clustering in VANETs”, IEEE International Conference on Advanced Information Networking and Applications (AINA 2016), Crans-Montana, Switzerland, March 2016, p.p 603-610.
- [C10] **M. A. Javed**, and E. B. Hamida, “Measuring Safety Awareness in Cooperative ITS Applications”, IEEE Wireless Communications and Networking Conference (WCNC 2016), Doha, Qatar, April 2016, p.p 1-7.
- [C11] **M. A. Javed**, J. Y. Khan and D. T. Ngo, “Multimedia Transmission for Emergency Services in VANETs”, IEEE Vehicular Technology Conference (VTC-Fall 2014), Vancouver, Canada, September 2014, p.p 1-5.
- [C12] **M. A. Javed**, J. Y. Khan and D. T. Ngo, “A Tone-Based Time-Slotted Protocol for Multi-Hop Emergency Message Dissemination in VANETs”, IEEE Vehicular Technology Conference (VTC-Spring 2014), Seoul, Korea, May 2014, p.p 1-5.
- [C13] **M. A. Javed**, J. Y. Khan and D. T. Ngo, “Joint Space-Division Multiple Access and Adaptive Rate Control for Basic Safety Messages in VANETs”, IEEE Wireless Communications and Networking Conference (WCNC 2014), Istanbul, Turkey, April 2014, p.p 1-6.
- [C14] **M. A. Javed** and J. Y. Khan, “Performance Analysis of an Adaptive Rate-Range Control Algorithm for VANET Safety Applications”, IEEE International

- Conference on Computing, Networking and Communications (ICNC 2014), Honolulu, United States, February 2014, p.p 418-423.
- [C15] **M. A. Javed** and J. Y. Khan, "Performance Analysis of a Time Headway Based Rate Control Algorithm for VANET Safety Applications", IEEE International Conference on Signal Processing and Communication Systems (ICSPCS 2013), Gold Coast, Australia, December 2013, pp. 1-6.
- [C16] **M. A. Javed** and J. Y. Khan, "A Cooperative Safety Zone Approach to Enhance the Performance of VANET Applications", IEEE Vehicular Technology Conference (VTC-Spring 2013), Dresden, Germany, June 2013, pp. 1-5.
- [C17] **M. A. Javed** and J. Y. Khan, "A Geocasting Technique in an IEEE802.11p based Vehicular Ad hoc Network for Road Traffic Management", IEEE Australasian Telecommunication Networks and Applications Conference (ATNAC 2011), Melbourne, Australia, November 2011, pp. 1-6.
- [C18] A. Mohsin, M. A. B. Altaf, N. M. Sheikh, **M. A. Javed** and M. Usman, "A New Approach to the implementation of VoIP for SOHO Network" IEEE International Conference in Electrical Engineering (ICEE 2009), Lahore, Pakistan, April 2009, pp. 1-6.

### Major Projects Completed

- Adaptive Security Algorithms for Intelligent Transport Systems in NS-3
- Adaptive QoS protocols for Smart Cities
- Throughput and delay analysis of IEEE 802.11p in different fading conditions
- Develop a multi-hop algorithm for broadcast storm suppression in OPNET
- Develop a SMTP mail client and server using Java language
- Implementation of Reliable Transport Protocol using Java language
- Implementation of Streaming Video Server and Client using Java language
- Design and Implementation of microwave amplifier at 1.8 GHz.
- Implementation of a complete Pipelined RISC Processor on FPGA using Verilog

### Software Skills

- OPNET and Ns-3 Network Simulators
- MATLAB, Proteus, Xilinx, Ansoft Designer, Visual Studio
- Programming Languages: Java, C, C++, Verilog HDL, Assembly

### Professional Memberships

- Graduate Student Member IEEE 2013-2014
- Graduate Student Member IEEE Vehicular Technology Society 2013-2014
- Graduate Student Member, Engineers Australia 2013-2015
- Professional Member, Pakistan Engineering Council 2009-present

### Professional Trainings and Services

- "Training work shop on ISO 9001:2015 Audit", Aug. 2017
- "Designing and Teaching courses for higher education students", Nov. 2009  
A joint training arranged by Bahria University and Higher Education Commission (HEC) for university lecturers
- Associate Editor  
IEEE Access
- Technical Reviewer for the following journals  
IEEE Communications Magazine  
IEEE Transactions on Intelligent Transport Systems  
IEEE Transactions on Vehicular Technology  
IEEE Transactions on Industrial Electronics  
IEEE Access  
Computer Communications

## Sensors

- Technical Reviewer for the following Conferences
  - IEEE Global Telecommunications Conference (GLOBECOM)
  - IEEE International Conference on Communications (ICC)
  - IEEE Vehicular Technology Conference (VTC)
  - IEEE Intl. Conf. on Wireless and Mobile Computing, Networking and Communications (WiMob)
  - IEEE Conference on Local Computer Networks (LCN)
  - Australian Communication Theory Workshop (AusCTW)
  - Intl. Symposium on Wireless Communication Systems (ISWCS)
- Technical Program Committee (TPC) Member
  - IEEE WiMob 2016

## English Language Proficiency

- Score of 107/120 in TOEFL IBT 2008
- Score of 8/9 in IELTS 2015

## REFERENCES

- Associate Professor Dr. Jamil Yusuf Khan, (Ph.D Supervisor)  
School of Electrical Engineering and Computer Science  
The University of Newcastle, Australia  
Email: Jamil.Khan@newcastle.edu.au  
Phone number: +61 2 4921 6077
- Lecturer Dr. Duy Trong Ngo, (Collaborator and Mentor)  
School of Electrical Engineering and Computer Science  
The University of Newcastle, Australia  
Email: Duy.Ngo@newcastle.edu.au  
Phone number: +61 2 4921 8947
- Chief Technology Officer  
Dr. Elyes Ben Hamida, (Collaborator and Mentor)  
Be-Bound  
Paris, France  
Email: elyes.benhamida@gmail.com  
Phone number: +33 6 83 90 12 28