

Md Sahabul Alam

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Summary

- Received **Governor General of Canada Gold Medal** which is the highest distinction at the graduate level.
- 10+ years of expertise in telecommunication engineering with focus on planning and implementation of digital and wireless communication systems.
- Solid background in communication theory, wireless systems, wireless network topologies (5G/B5G, LTE), non-terrestrial (UAV & HAPS) communications, smart grid communications, MIMO, and NOMA systems.
- Coauthored more than 30 publications in respected journals and conference proceedings.

Education

- 2016–2019 **Ph.D. in Electrical Engineering**, *Ecole de Technologie Supérieure (ETS), University of Quebec*, Montreal, QC, Canada, *GPA – 4.30/4.30*.
Dissertation: Robust Wireless Sensor Network for Smart Grid Communication: Modeling and Performance Evaluation (Supervisor: Professor Georges Kaddoum & Professor Basile L. Agba).
- 2008–2010 **M.Sc. in Telecommunication Engineering**, *INRS-EMT, University of Quebec*, Montreal, QC, Canada.
Dissertation: Design and Performance Analysis of Decentralized Relay Selection Techniques in Wireless Sensor Networks. (Supervisor: Professor Sofiene Affes)
- 1999–2003 **B.Sc. in Electrical & Electronic Engineering**, *Khulna University of Engineering and Technology*, Khulna, Bangladesh.
Dissertation: Design of Protection Schemes based on Some Physical Quantities (Supervisor: Professor B. C. Chandra Ghosh).

Teaching Experience

- 2021–Present **Assistant Professor (Tenure-Track)**
Department of Electrical and Computer Engineering
College of Engineering and Computer Science
California State University, Northridge (CSUN)
Northridge, California, USA
- 2020–2021 **Instructor** (Part-time)
Department of Engineering and Architecture
College of Engineering
Algonquin College
Ottawa, Ontario, Canada
- 2004–2007 **Lecturer & Assistant Professor**
Department of Electrical and Electronic Engineering
Faculty of Electrical and Electronic Engineering
Khulna University of Engineering and Technology (KUET)
Khulna, Bangladesh

Research Experience

- 2019–2021 **Postdoctoral Fellow (Funded by FRQNT and Huawei R&D Centre)**
Department of Systems and Computer Engineering
Carleton University
Ottawa, Ontario, Canada
Project Title: Integrated Aerial and Terrestrial Networks Towards an Ultra Agile Wireless Access Architecture.
- 2016–2019 **Graduate Research Assistant (Funded by Hydro-Quebec Research Institute)**
Department of Electrical Engineering
Ecole de Technologie Supérieure (ETS)
Montreal, Quebec, Canada
Project Title: Robust Wireless Sensor Network for Harsh Smart Grid Communication.
- 2013–2015 **Research Assistant (Funded by Hydro-Quebec Research Institute)**
Department of Electrical and Computer Engineering
McGill University
Montreal, Quebec, Canada
Project Title: Collaborative Wireless Sensor Network for Smart Grid Communication.
- 2011–2012 **Research Assistant (Funded by Research In Motion)**
Department of Electrical and Computer Engineering
McGill University
Montreal, Quebec, Canada
Project Title: Distributed Cooperative Spectrum Sensing Scheme for Cognitive Radio Networks.
- 2008–2010 **Graduate Research Assistant (Funded by Ericsson Canada Inc.)**
Department of Telecommunication Engineering
INRS-EMT
Montreal, Quebec, Canada
Project Title: Development and Design of Advanced Flexible Antenna Structures for 4G.

Industrial Experience

- 2004–2007 **Electrical Engineer (Part-time)**
Consultancy, Research, and Testing Services (CRTS)
Department of Electrical and Electronic Engineering
Khulna University of Engineering and Technology (KUET)
Khulna, Bangladesh

Selected Awards and Grants

- 2022 CSUN College of Engineering and Computer Science Summer Research Grant
- 2019 **Governor General of Canada Gold Medal.**
- 2019–2021 FRQNT Postdoctoral Fellowship (value of \$85,000/year).
Rank 2 in Communication Technology group, Canada.
- 2018–2019 NSERC Postgraduate Scholarship (value of \$35,000/year).
- 2017–2018 FRQNT Doctoral Scholarship (value of \$25,000/year).
- 2016–2017 J. A. DeSeve Doctoral Scholarship (value of \$20,000/year).
- 2008–2010 Graduate Scholarship (value of \$19,000/year).
- 2008–2010 Tuition Fee Exemption Scholarship (value of \$20,000/year).

Courses Taught

Instructor for the following courses at California State University, Northridge

- ECE 351 - Linear Systems II
- ECE 450 - Probabilistic Systems in Electrical Engineering: Design and Analysis
- ECE 561 - Digital Communication Systems
- ECE 650 - Random Processes

Instructor for the following courses at Khulna University of Engineering and Technology, Bangladesh

- EE 1103 - Basic Electrical Engineering (Lecture & Lab)
- EE 1203 - Electric Circuit and Filter Design
- EE 2209 - Electronics II (Lecture & Lab)
- EE 2235 - Signals and Systems
- EE 3113 - Digital Electronics and Logic Design (Lecture & Lab)
- EE 3205 - Communication Engineering I (Lecture & Lab)
- EE 4105 - Communication Engineering II (Lecture & Lab)
- EE 4135 - Digital Signal Processing (Lecture & Lab)

Student Supervision

Graduate Student Supervision

- Hazem Barka (Ph.D., Sep. 2021–Present, Co-supervise with G. Kaddoum at ETS, Montreal, Canada)
Research Topic: AI/ML Enabled Robust Receiver Design for Smart Grid Communications
- Jaymish Raju Patel (M. S., Electrical and Computer Engineering Department, CSUN)
Research Topic: Algorithm Predictor (2021)

Undergraduate Student Supervision

- Mottaleb Hossain Liton (B. Sc., Electrical and Electronic Engineering Department, KUET, Bangladesh)
Research Topic: Design of Digital Lock (2007)
- S M Manna Mehedi (B. Sc., Electrical and Electronic Engineering Department, KUET, Bangladesh)
Research Topic: Design of Protection Schemes Based on Some Physical Schemes (2005)
- Utpal Saha (B. Sc., Electrical and Electronic Engineering Department, KUET, Bangladesh)
Research Topic: Design of Protection Schemes Based on Some Physical Quantities (2005)

Service

Academic Services

- 2004–Present Mentor, mentored 2 Ph.D., 3 masters, and 8 undergraduate students, who successfully completed their programs.
- 2019–Present Funding/Grant Proposals Assessor
- Applied and funded for FRQNT Postdoctoral Fellowship Grant that raised > 120K CAD
 - Assisted the PIs in writing successful proposals that raised > 300K CAD
 - Mitacs-Accelerate Program with industry partner Ericsson Canada for the project titled “Application of machine learning on wireless communications.”
 - Funding agency: Hydro-Quebec Research Institute (IREQ), Montreal, Canada for the project titled “AI-based environment characterization and distributed system design.”

CSUN Committee Memberships and Services

- 2021–Present Adviser, IEEE CSUN Student Branch
- 2021–Present Committee Member, College of Engineering and Computer Science Program Assessment Committee
- 2021–Present ECE Department Representative, University Program Assessment Committee
- 2022–Present Committee Member, ECE Department Lecturer Committee

Professional Memberships and Services

2019–Present Member of IEEE

2008–2018 Student Member of IEEE and IEEE Communications Society

2004–2008 Member, Institution of Engineers (IEB), Bangladesh

2018 TPC Member of IEEE VTC

2015–2016 Organizing volunteer for IEEE ICUWB'15 and IEEE VTC'16 conferences.

2017–2018 Treasurer, IEEE ETS Student Branch.

2016–2019 Committee Member, Judging Panel, Electrical Engineering Research Showcase, ETS.

2004–now Mentor, ETS, McGill University, INRS, KUET (trained and mentored undergrad and grad students.)

2005–2006 Workshop and Training Coordinator, IEEE KUET Student Branch.

2004–2007 Committee Member, BSc Engineering course curriculum up-gradation committee, KUET.

Journal/Transaction Article Reviewer

- IEEE Transactions on Communications
- IEEE Transactions on Vehicular Technology
- IEEE Access
- IEEE Systems Journal
- IEEE Communications Magazine
- IEEE Communications Letters
- IEEE Signal Processing Letters
- IET Electronics Letters

Conference Paper Reviewer

- IEEE International Conference on Communications (ICC)
- IEEE Wireless Communication and Networking Conference (WCNC)
- IEEE Wireless Vehicular Technology Conference (VTC),
- IEEE Smart Grid Communications Conference (SmartGridComm)

Professional Development (Workshops/Trainings)

- Certificate in University Teaching (Jan. 2020 – Apr. 2020)
Educational Development Centre (EDC), Carleton University, Ottawa, Canada
- Teaching and Learning with Technology (Feb. 2020)
Educational Development Centre (EDC), Carleton University, Ottawa, Canada
- Teaching is More Than Talking (Feb. 2020)
Centre for Organizational Learning (COL), Algonquin College, Ottawa, Canada
- The Nuts & Bolts of Teaching and Evaluation (Jan. 2020)
Centre for Organizational Learning (COL), Algonquin College, Ottawa, Canada
- Introduction to Course Design and Enhance Student Engagement Workshop (Nov. 2019)
Educational Development Centre (EDC), Carleton University, Ottawa, Canada
- Creative Teaching Techniques (Mar. 2006)
Continuing Education Centre (CEC), Dhaka, Bangladesh

Community and Volunteer Activities

- Founding member, Bibek Aid Foundation, A Canada Based Charity Organization
- Committee member, Bangladesh Students' Association (BSA), ETS
- Fund Raising Volunteer, Alumni Association, KUET
- Anchor, Meet and Greet
- Fund Raising Volunteer, Bangladesh Graduate Students' and Professionals' Association, Canada

Professional Skills

Wireless network:

Solid background in digital communications and wireless network techniques (6G, 5G, 4G/LTE, and 3G). Strong knowledge in different areas of wireless systems such as non-terrestrial communications, cooperative communications, smart grid communications, IoT, NOMA, MIMO, and cognitive radio.

Signal processing:

Very good understanding of probability theory, random processing, and statistics, detection and estimation techniques. Familiar with machine learning algorithms like deep learning and reinforcement learning for wireless communications.

Workplace skills:

- Communication skills: Excellent communication skills, developed through work experience dealing with students' problems as Instructor/TA during classes, tutorials, and labs and help them to find solutions.
- Analytical skills: Provide daily and weekly reports about performance of the wireless systems.

Research Interests

- Smart Grid Communications
- Aerial Communications (UAV & HAPS)
- Integration of Terrestrial and Non-terrestrial Communications
- Machine Learning for Wireless Communications
- Cooperative Communications
- Massive MIMO
- NOMA
- IoT Networks

Recent Publications

Note: Full record of my publications can be found [here](#).

Recent Transactions/Journals

- **M. S. Alam**, B. Selim, G. Kaddoum, and H. Yanikomeroglu, "Bursty impulsive noise mitigation in NOMA: A MAP receiver-based approach", IEEE Communications Letters, Vol. 25, No. 9, pp. 2790–2794, Sep. 2021.
- **M. S. Alam**, G. K. Kurt, H. Yanikomeroglu, P. Zhu, and N. Dao., "High altitude platform station based super macro base station constellations", IEEE Communications Magazine, Vol. 59, No. 1, pp. 103–109, 2021.
- **M. S. Alam**, B. Selim, G. Kaddoum, and B. L. Agba., "Mitigation techniques for impulsive noise with memory modeled by a two state Markov-Gaussian process", IEEE Systems Journal, Vol. 14, No. 3, pp. 4079–4088, Sep. 2020.
- **M. S. Alam**, G. Kaddoum, and B. L. Agba, "A novel relay selection strategy of cooperative network impaired by bursty Impulsive Noise", IEEE Transactions on Vehicular Technology, Vol. 68, No. 7, pp. 6622–6635, Jul. 2019.
- **M. S. Alam**, G. Kaddoum, and B. L. Agba, "Performance analysis of distributed wireless sensor network for Gaussian source estimation in the presence of impulsive noise", IEEE Signal Processing Letters, Vol. 25, No. 6, pp. 803–807, Jun. 2018.
- **M. S. Alam**, G. Kaddoum, and B. L. Agba., "Bayesian MMSE estimation of a Gaussian source in the presence of bursty impulsive noise", IEEE Communications Letters, Vol. 22, No. 9, pp. 1846–1849, Sep. 2018.
- **M. S. Alam**, F. Labeau, and G. Kaddoum, "Performance analysis of DF cooperative relaying over bursty impulsive noise channel", IEEE Transactions on Communications, Vol. 64, No. 7, pp. 2848–2859, Jul. 2016.

- G. K. Kurt, M. G. Khoshkholgh, S. Alfattani, A. Ibrahim, T. Darwish, **M. S. Alam**, H. Yanikomeroglu, and A. Yongacoglu, "A vision and framework for the high altitude platform station (HAPS) networks of the future", IEEE Communications Surveys & Tutorials, Vol. 23, No. 2, pp. 729–779, 2021.
- B. Selim, **M. S. Alam**, J. V. C. Evangelista, G. Kaddoum, and B. L. Agba, "NOMA in IoT networks: Impulsive noise effect and mitigation", IEEE Communications Magazine, Vol. 58, No. 11, pp. 69–75, Nov. 2020.
- I. Ahmed, **M. S. Alam**, M. J. Hossian, and G. Kaddoum, "Deep learning for MMSE estimation of a Gaussian source in the presence of bursty impulsive noise", IEEE Communications Letters, Vol. 25, No. 04, pp. 1211–1215, December 2020.
- B. Selim, **M. S. Alam**, G. Kaddoum, and B. L. Agba, "Effect of impulsive noise on uplink NOMA systems", IEEE Transactions on Vehicular Technology, Vol. 69, No. 03, pp. 3454–3458, March 2020.
- Attalah, **M. S. Alam**, and G. Kaddoum, "Secrecy analysis of wireless sensor network in smart grid with destination assisted jamming", IET Communications, Vol. 13, No. 12, pp. 1748–1752, 2019.
- M. Au, G. Kaddoum, **M. S. Alam**, F. Gagnon, and E. Bashar, "Joint code-frequency index modulation for IoT and multi-user communications", IEEE Journal on Selected Topics in Signal Processing, Vol. 13, No. 06, pp. 1223–1236, October 2019.

Recent Conferences

- **M. S. Alam**, B. Selim, G. Kaddoum, and B. L. Agba, "Analysis and comparison of several mitigation techniques for Middleton Class-A noise", IEEE LATINCOM, Salvador, Brazil, 2019.
- **M. S. Alam** and F. Labeau, "Effect of bursty impulsive noise on the performance of multi-relay DF cooperative relaying scheme", IEEE VTC, Nanjing, China, 2016.
- **M. S. Alam** and F. Labeau, "On relay selection in bursty impulsive noise channel", IEEE WCNC, Qatar, 2016.
- **M. S. Alam** and F. Labeau, "Performance analysis of DF cooperative relaying over bursty impulsive noise channel", IEEE SmartGridComm, Miami, USA, 2016.
- **M. S. Alam**, K. Zarifi, S. Affes, and A. Ghrayeb, "Design and Performance analysis of distributed relay selection techniques in wireless networks", IEEE QBSC, Kingston, Canada, 2010.
- R. Deka, V. Mishra, I. Ahmed, S. Anees, and **M. S. Alam**, "Performance analysis of HAPS assisted dual-hop hybrid RF/FSO system", IEEE VTC, Online, 2021.
- B. Selim, **M. S. Alam**, G. Kaddoum, and B. L. Agba, "Optimal multi-stage clipping for impulsive noise mitigation in OFDM-NOMA systems", IEEE International Conference on Advanced Communication Technologies and Networking, Online, 2021.
- B. Selim, **M. S. Alam**, G. Kaddoum, and B. L. Agba, "A Deep learning approach for the Estimation of Middleton Class-A Impulsive Noise Parameters", IEEE ICC, Dublin, Ireland, 2020.

Research Collaboration

- 2019–Present Prof. Halim Yanikomeroglu, Carleton University, Ottawa, Canada
- 2016–Present Prof. Georges Kaddoum, ETS, University of Quebec, Montreal, Canada
- 2016–Present Dr. Basile L. Agba, Principle Researcher, Hydro-Quebec Research Institute, Montreal, Canada
- 2019–Present Prof. Imtiaz Ahmed, Assistant Professor, Howard University, USA
- 2016–Present Prof. Bassant Selim, ETS, University of Quebec, Montreal, Canada
- 2019–Present Prof. Jahangir Hossain, The University of British Columbia, Kelowna, Canada
- 2019–Present Prof. Tareq Al-Naffouri, King Abdullah University of Science and Technology, Saudi Arabia
- 2019–Present Prof. Gunes Karabulut Kurt, University Of Montreal, Montreal, Canada
- 2020–Present Prof. Sanyaa Anees, IIT, Guwahati, India
- 2021–Present Prof. Lutfa Akhtar, BUET, Dhaka, Bangladesh