

Khandaker Foysal Haque

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Career Objective

I am a motivated and accomplished Ph.D. candidate specializing in intelligent wireless networking and integrated sensing & communication within the Department of Electrical and Computer Engineering at Northeastern University, seeking a challenging research position in academia.

Highlights

- 25+ peer-reviewed publications across venues including *IEEE INFOCOM*, *ACM MobiHoc*, *ACM MobiCom Workshops*, *IEEE WoWMoM*, *Computer Networks* and *IEEE Wireless Communications Letters*.
- Research focus on Wi-Fi, mmWave, and sub-THz ISAC, Learning Driven MU-MIMO systems, and wireless edge computing.
- Developer of open-source wireless testbeds and tools including Wi-BFI, m3MIMO, and WiSEC.

Education

Ph.D. in Computer Engineering

Specialization: Learning Driven Intelligent Wireless System

Northeastern University, Boston, USA
September 2021 – April 2026 (Expected)

Thesis: Domain-Adaptive Learning-Driven Intelligent Wireless Systems for Sensing and Edge Computing

Research Advisor: Prof. Francesco Restuccia

Research Focus:

- Integrated sensing in sub-6 GHz, mmWave and sub-THz band
- Sensing assisted MIMO communication
- Learning driven MIMO systems
- Sensing assisted edge computing
- Secured MIMO system with covert communication

CGPA: 3.75/4.00

M.Sc. in Computer Engineering

Major: Internet of Things (IoT) & Machine Learning

Central Michigan University, Mount Pleasant, USA
September 2019 – May 2021

Research Advisor: Prof. Ahmed Abdelgawad and Prof. Kumar Yelamarthi

Thesis: LoRa Architecture for V2X Communication: An Experimental Evaluation with Vehicles on the Move

CGPA: 4.00/4.00

B.Sc. in Electrical and Electronic Engineering

Major: Radio-frequency and wireless communication

Islamic University of Technology, Bangladesh
December 2012 – November 2016

Research Advisor: Prof. Habibul Kabir

Thesis: Evaluation and Designing of Routing Protocols for Underwater Delay Tolerant Networks

CGPA: 3.52/4.00

Research Experience

Ph.D. Research Work

ECE, Northeastern University, USA
September 2021 – Present

Integrated Sensing in sub-6 GHz, mmWave and sub-THz band

- Designed framework for Wi-Fi beamforming feedback-based integrated sensing
- Developed a simultaneous multi-subject sensing system
- Designed domain-adaptive frameworks for wireless sensing platforms

- Developed an integrated-sensing framework for mmWave (58 GHz) CFR
- Designed a domain-adaptive joint communication and sensing system at sub-THz (130 GHz) band
- Developed a neural radio fingerprinting framework with MIMO compressed feedback

Sensing Assisted Edge Computing

- Developed a DNN-integrated physical layer for ultra-low latency mobile edge computing
- Designed sensing-assisted wireless edge computing system from the ground up
- Developed a reliable task offloading system through semantic MU-MIMO communication

Sensing Assisted, Learning Driven MIMO System

- Developed a learning-based multi-band CFR fusion framework for improved channel estimation.
- Designed an efficient, high-accuracy multipath extraction method using Approximate-DFT
- Evaluated the impact of MIMO feedback quantization in IEEE 802.11 Wi-Fi networks
- Developed a data-driven scheme to dynamically reduce MIMO feedback overhead

Development of Testbed and Tools

- Developed Wi-BFI tool to extract the IEEE 802.11 feedback information in the wild from COTS devices
- Developed mmWave MU-MIMO testbed with Pi-Radio SDRs for ISAC research
- Designed WiSEC, a modular multi-band, multi-antenna testbed with 18 independently configurable NICs for diverse MIMO and sensing research.
- Developed a MU-MIMO Wi-Fi testbed supporting real-time edge computing

Research Collaboration with NSF INTERN Grant

DEVCOM Army Research Lab, Adelphi, USA

September 2024 – December 2024

January 2025 – April 2025 (NSF INTERN Grant)

- Continued collaborative research from the summer internship, advancing the design and development of the covert communication framework

Intern Research Work

DEVCOM Army Research Lab, Adelphi, USA

May 2024 – August 2024

- Developed simultaneous multi-modal covert routing approach
- Worked with energy efficiency and communication overhead reduction in multi-modal covert routing approaches

M.Sc. Research Work

Central Michigan University, USA

September 2019 – May 2021

- Designed Vehicle-to-Everything (V2X) communication architecture with different IoT technologies
- Evaluated the performance of Zigbee, LoRa, and Bluetooth Low Energy (BLE)
- Developed cyber-physical systems for smart city applications

Collaborative Research Experiences for Teachers (RET) Program

Central Michigan University, USA

June 2020 – July 2020

- Led the RET team to develop an on-board vehicular testbed.

B.Sc. Research Work

Islamic University of Technology

January 2016v– October 2016

- Designed and evaluated routing protocols for underwater wireless communication

Work Experience

Research Intern

DEVCOM Army Research Lab

May 2024 – August 2024

Conducted research on covert communication with *Dr. Fikadu Dagefu's* group in the *Network Cyber & Computational Sciences (NCCS)* Division.

Graduate Research Assistant

*Dept. of Electrical & Computer Engineering, Northeastern University
September 2021 – Present*

Graduate Teaching Assistant

*College of Engineering, Central Michigan University
September 2019 – May 2021*

Courses Taught: Digital Circuits, Communication Systems, Wireless Sensor Networks, Microelectronic Circuits, Microprocessor Fundamentals.

Lecturer

*European University of Bangladesh, Bangladesh
October 2017 – July 2019*

Courses Taught: Electrical Machines I & II, Microprocessor and Embedded Systems

Industrial Intern I

*Bangladesh Power Development Board (BPDB)
October 2015 – November 2015*

Industrial Intern II

*Bangladesh Atomic Energy Commission (BAEC)
November 2015 – December 2015*

Industrial Intern III

*Bangladesh Telecommunication Limited (BTCL)
December 2015 – January 2015*

Technical skills

Programming Languages

Python, C, C++, Assembly, HTML, SQL

Software Skills

MATLAB, SIMULINK, Cooja, Omnet++, NS3, GNU radio, XCTu, Pspice, Proteus, Atoll, Micro wind, Autocad, Netlogo, Cadence, Homer

Hardware Skills

Software Defined Radios (SDR), Wireless Testbeds and Single Board Computers (SBC), Wireless Emulator – Colosseum, Edge Computing Testbeds

Publications

Google Scholar

Citations: 663

h-index: 12

i10-index: 13

Conference Proceedings

- **Haque, K. F.**, Meneghello, & Restuccia, F. (2025). *BandWeave: Multi-Band CFR Fusion for Enhanced Channel Estimation in Wi-Fi Systems*. Proceedings of the 2026 IEEE International Conference on Computer Communications (INFOCOM) (*under review*).
- Rumman, K. M., Meneghello, F., **Haque, K. F.**, Gringoli, F., & Restuccia, F. (2025). *SHRINK: Reducing MIMO Feedback Overhead in Wi-Fi with Dynamic Data-Driven Channel Sounding*. In Proceedings of the Twenty-sixth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (MobiHoc '25) (27–30 October, pp. 11–20). Houston, USA, IEEE. DOI: <https://doi.org/10.1145/3704413.3764421>.
- Contreras, S. L., **Haque, K. F.**, Restuccia, F., & Levorato, M. (2025). *SOAR: Semantic Multi-User MIMO Communications for Reliable Wireless Edge Computing*. In Proceedings of the 2025 21st International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT) (9–11 June, pp. 35–42). Lucca, Italy, IEEE. DOI: <https://doi.org/10.1109/DCOSS-IoT65416.2025.00014>.

- **Haque, K. F.**, Kong, J., Moore, T. J., Restuccia, F., & Dagefu, F. T. (2025). *DEER: Simultaneous Multi-Modal Decentralized Energy Efficient Covert Routing*. In Proceedings of the 2025 IEEE Wireless Communications and Networking Conference (WCNC) (9–12 March, pp. 1–6). Milan, Italy, IEEE. DOI: <https://doi.org/10.1109/WCNC61545.2025.10978544>.
- **Haque, K. F.**, Rumman, K. M., Elyasi, A., Meneghello, F., & Restuccia, F. (2025). *MAGIC: Meta-Learning Adaptive Gesture Recognition with mmWave MIMO CSI*. In Proceedings of the 2025 IEEE 26th International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM) (19–22 May, pp. 131–140). Texas, USA, IEEE. DOI: <https://doi.org/10.1109/WoWMoM65615.2025.00030>.
- Meneghello, F., **Haque, K. F.**, & Restuccia, F. (2025). *Radio Fingerprinting of Wi-Fi Devices Through MIMO Compressed Channel Feedback*. In Proceedings of the 2025 IEEE International Conference on Computer Communications Workshops (INFOCOM WKSHPS) (19–22 May, pp. 1–6). London, United Kingdom, IEEE. DOI: <https://doi.org/10.1109/INFOCOMWKSHPS65812.2025.11152893>.
- Abdi, M., **Haque, K. F.**, Meneghello, F., Ashdown, J., & Restuccia, F. (2025). *PhyDNNs: Bringing Deep Neural Networks to the Physical Layer*. In Proceedings of the 2025 IEEE International Conference on Computer Communications (INFOCOM) (19–22 May, pp. 1–10). London, United Kingdom, IEEE. DOI: <https://doi.org/10.1109/INFOCOM55648.2025.11044671>.
- **Haque, K. F.**, Meneghello, F., Rumman, K. M., & Restuccia, F. (2024, November). *m3MIMO: An 8×8 mmWave Multi-User MIMO Testbed for Wireless Research*. In Proceedings of the 30th Annual International Conference on Mobile Computing and Networking (MobiCom) Workshops (pp. 1922–1929). DOI: <https://doi.org/10.1145/3636534.3697321>.
- **Haque, K. F.**, Meneghello, F., & Restuccia, F. (2024, October). *Integrated Sensing and Communication for Efficient Edge Computing*. In Proceedings of the 2024 20th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob) (pp. 611–614). IEEE. DOI: <https://doi.org/10.1109/WiMob61911.2024.10770523>.
- **Haque, K. F.**, Meneghello, F., & Restuccia, F. (2024, January). *BFA-Sense: Learning Beamforming Feedback Angles for Wi-Fi Sensing*. In Proceedings of the 22nd International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops 2024), Biarritz, France, IEEE. DOI: <https://doi.org/10.1109/PerComWorkshops59983.2024.10503460>.
- **Haque, K. F.**, Meneghello, F., & Restuccia, F. (2023, October). *Wi-BFI: Extracting the IEEE 802.11 Beamforming Feedback Information from Commercial Wi-Fi Devices*. In Proceedings of the 17th ACM Workshop on Wireless Network Testbeds, Experimental evaluation & Characterization (WiNTECH) (pp. 104–111). Madrid, Spain, ACM. DOI: <https://doi.org/10.1145/3615453.3616514>.
- Sazzad, A., Nower, N., Mahbub Rimi, M., Habibul Kabir, K., & **Haque, K. F.** (2023, August). *Designing of an Underwater Internet of Things (U-IoT) for Marine Life Monitoring*. In The Fourth Industrial Revolution and Beyond: Select Proceedings of IC4IR+ (pp. 291–303), Dhaka, Bangladesh, Springer. DOI: https://doi.org/10.1007/978-981-19-8032-9_21.
- **Haque, K. F.**, Zhang, M., & Restuccia, F. (2023, May). *SiMWiSense: Simultaneous Multi-Subject Activity Classification Through Wi-Fi Signals*. In Proceedings of the IEEE 24th International Symposium on a World of Wireless, Mobile, and Multimedia Networks (WoWMoM) (pp. 46–55). Boston, USA, IEEE. DOI: <https://doi.org/10.1109/WoWMoM57956.2023.00019>.
- Zabin, R., & **Haque, K. F.** (2023, January). *Energy Consumption Optimization of Zigbee Communication: An Experimental Approach with XBee S2C Module*. In Proceedings of International Conference on Information and Communication Technology for Development: ICICTD 2022 (pp. 521–534). Khulna, Bangladesh, Springer. DOI: https://doi.org/10.1007/978-981-19-7528-8_41.
- Hafiz, K. N., & **Haque, K. F.** (2022, July). *Convolutional Neural Network (CNN) in COVID-19 Detection: A Case Study with Chest CT Scan Images*. In 2022 IEEE Region 10 Symposium (TENSYP) (pp. 1–6). Mumbai, India, IEEE. DOI: <https://doi.org/10.1109/TENSYP54529.2022.9864536>

- Saqib, N., **Haque, K. F.**, Yelamarthi, K., Yanambaka, P., & Abdelgawad, A. (2021, June). *D2D-LoRa Latency Analysis: An Indoor Application Perspective*. In 2021 IEEE 7th World Forum on Internet of Things (WF-IoT) (pp. 29-34). New Orleans, USA, IEEE. DOI:<https://doi.org/10.1109/WF-IoT51360.2021.9595324>
- **Haque, K. F.**, Abdelgawad, A., Yanambaka, V. P., & Yelamarthi, K. (2020, December). *A LoRa based reliable and low power vehicle to everything (V2X) communication architecture*. In 2020 IEEE International Symposium on Smart Electronic Systems (iSES)(Formerly iNiS) (pp. 177-182). Chennai, India, IEEE. **(best paper)** DOI:<https://doi.org/10.1109/iSES50453.2020.00047>
- **Haque, K. F.**, Haque, F. F., Gandy, L., & Abdelgawad, A. (2020, August). *Automatic detection of COVID-19 from chest X-ray images with convolutional neural networks*. In 2020 international conference on computing, electronics & communications engineering (iCCECE) (pp. 125-130). Southend, UK, IEEE. DOI:<https://doi.org/10.1109/iCCECE49321.2020.9231235>
- **Haque, K. F.**, Zabin, R., Yelamarthi, K., Yanambaka, P., & Abdelgawad, A. (2020, June). *An IoT based efficient waste collection system with smart bins*. In 2020 IEEE 6th World Forum on Internet of Things (WF-IoT) (pp. 1-5). New Orleans, USA, IEEE. DOI:<https://doi.org/10.1109/WF-IoT48130.2020.9221251>.
- **Haque, K. F.**, Abdelgawad, A., Yanambaka, V. P., & Yelamarthi, K. (2020, June). *An energy-efficient and reliable RPL for IoT*. In 2020 IEEE 6th World Forum on Internet of Things (WF-IoT) (pp. 1-2). New Orleans, USA IEEE. DOI:<https://doi.org/10.1109/WF-IoT48130.2020.9221450>
- **Haque, K. F.**, Saqib, N., & Rahman, M. S. (2019, March). *An optimized stand-alone green hybrid grid system for an offshore Island, Saint Martin, Bangladesh*. In 2019 International Conference on Energy and Power Engineering (ICEPE) (pp. 1-5). Dhaka, Bangladesh, IEEE. DOI:<https://doi.org/10.1109/CEPE.2019.8726596>.
- Saqib, N., **Haque, K. F.**, Zabin, R., & Preonto, S. N. (2019, January). *Analysis of grid integrated PV system as home RES with net metering scheme*. In 2019 international conference on robotics, electrical and signal processing techniques (ICREST) (pp. 395-399). Dhaka, Bangladesh, IEEE. DOI:[10.1109/ICREST.2019.8644098](https://doi.org/10.1109/ICREST.2019.8644098).

Journal Articles and Book Chapters

- **Haque, K. F.**, Kong, J. H., Moore, T. J., Chan, K., Restuccia, F., & Dagefu, F. T. (2025). *DECOR: Multi-Modal Decentralized Cluster-based Energy Efficient Covert Routing in HetNets*. IEEE Transactions on Information Forensics and Security (TIFS). (under review)
- **Haque, K. F.**, Meneghello, F., & Restuccia, F. (2025). *Advancing Wi-Fi Sensing: Comprehensive CSI and BFI Datasets for Human Activity Recognition*. IEEE Communications Magazine (under review).
- **Haque, K. F.**, Zhang, M., Meneghello, F., & Restuccia, F. (2025). *Si-FI: Learning the Beamforming Feedback for Simultaneous Multi-Subject Sensing*. Computer Networks. Elsevier.(accepted)
- **Haque, K. F.**, Meneghello, F., & Restuccia, F. (2025). *SAWEC: Sensing-Assisted Wireless Edge Computing for Mobile Virtual Reality Applications*. IEEE Transactions on Mobile Computing. IEEE. (under review) DOI:<https://doi.org/10.48550/arXiv.2402.10021>.
- **Haque, K. F.**, Cantos-Roman, X., Meneghello, F., Jornet, J. M., & Restuccia, F. (2025). *SCOPE: Cooperative Integrated Communications and Sensing for Material Classification at Sub-Terahertz Frequencies*. IEEE Wireless Communications Letters, IEEE. DOI:<https://doi.org/10.1109/LWC.2025.3576010>.
- **Haque, K. F.**, Zhang, M., Meneghello, F., & Restuccia, F. (2025). *BeamSense: Rethinking Wireless Sensing with MU-MIMO Wi-Fi Beamforming Feedback*. Computer Networks, p.111020, Elsevier. DOI:<https://doi.org/10.1016/j.comnet.2024.111020>.
- Meneghello, F., **Haque, K. F.**, & Restuccia, F. (2024). *Evaluating the Impact of Channel Feedback Quantization and Grouping in IEEE 802.11 MIMO Wi-Fi Networks*. IEEE Wireless Communications Letters. IEEE. DOI:<https://doi.org/10.1109/LWC.2024.3469383>.

- Zabin, R., **Haque, K. F.**, & Abdelgawad, A. (2024). *PredXGBR: A Machine Learning Framework for Short-Term Electrical Load Prediction*. Electronics, 13(22), 4521. MDPI. DOI:<https://doi.org/10.3390/electronics13224521>.
- **Haque, K. F.**, Abdelgawad, A., & Yelamarthi, K. (2022). *Comprehensive performance analysis of zigbee communication: an experimental approach with XBee S2C module*. Sensors, 22(9), 3245. MDPI. DOI:<https://doi.org/10.3390/s22093245>.
- Saqib, N., **Haque, K. F.**, Yanambaka, V. P., & Abdelgawad, A. (2022). *Convolutional-neural-network-based handwritten character recognition: an approach with massive multisource data*. Algorithms, 15(4), 129. MDPI. DOI:<https://doi.org/10.3390/a15040129>.
- **Haque, K. F.**, & Abdelgawad, A. (2021). *Prospects of Internet of Things (IoT) and Machine Learning to Fight Against COVID-19*. Advanced Systems for Biomedical Applications, 93-109. Springer. DOI:https://doi.org/10.1007/978-3-030-71221-1_5.
- **Haque, K. F.**, Abdelgawad, A., Yanambaka, V. P., & Yelamarthi, K. (2020). *Lora architecture for v2x communication: An experimental evaluation with vehicles on the move*. Sensors, 20(23), 6876. MDPI. DOI:<https://doi.org/10.3390/s20236876>.
- **Haque, K. F.**, & Abdelgawad, A. (2020). *A deep learning approach to detect COVID-19 patients from chest X-ray images*. AI, 1(3), 27. MDPI. DOI:<https://doi.org/10.3390/ai1030027>.
- **Haque, K. F.**, Kabir, K. H., & Abdelgawad, A. (2020). *Advancement of routing protocols and applications of underwater wireless sensor network (UWSN)—A survey*. Journal of Sensor and Actuator Networks, 9(2), 19. MDPI. DOI:<https://doi.org/10.3390/jsan9020019>.

Patents

- Restuccia, F., **Haque, K. F.**, Meneghello, F., & Ashdown, J. *"BandWeave: Enhanced Channel Estimation in MIMO Networks with Multi-Band Fusion"* U.S. Provisional Patent Application 63/859,745, filed August 7, 2025. (Provisional)
- Restuccia, F., Abdi, M., & **Haque, K. F.** *"PhyDNNs: Bringing Deep Neural Networks to the Physical Layer"* U.S. Provisional Patent Application 19/183,466, filed April 4, 2025. (Provisional)
- Restuccia, F., Meneghello, F., Rumman, K. M., **Haque, K. F.**, & Gringoli, F. *"SHRINK: Dynamic Data-Driven Channel Sounding for Reduced MIMO Feedback Overhead in Wi-Fi"* U.S. Provisional Patent Application 63/735,833, filed December 18, 2024. (Provisional)
- Restuccia, F., **Haque, K. F.**, Zhang, M., Meneghello, F. *"Method and apparatus for Wi-Fi sensing through MU-MIMO beamforming feedback learning"* U.S. Patent Application PCT/US23/31651, filed August 31, 2023. (Pending)
- Restuccia, F., **Haque, K. F.**, Zhang, M. *"Simultaneous Multi-Subject Activity Classification Through Wi-Fi Signals"* U.S. Patent Application 18/489,570, filed October 18, 2023. (Pending)

Student Mentorship

- Mentored undergraduate and MS students at Northeastern University on research projects related to Wi-Fi sensing, MU-MIMO systems, and wireless edge computing.
- Supervised undergraduate researchers at Central Michigan University during MS studies on IoT, V2X communication, and embedded systems projects.
- Mentored external undergraduate and MS-level students from other institutions on topics including wireless sensing, and machine learning for communication systems.

Service

Reviewer

- Computer Networks (ComNet)
- IEEE Wireless Communication Letters (WCL)
- IEEE Transaction on Mobile Computing (TMC)
- IEEE Transactions on Cognitive Communications and Networking (TCCN)
- IEEE/ACM International Symposium on Quality of Service (IWQoS)
- IEEE Wireless Communications and Networking Conference (WCNC)
- IEEE International Conference on Communications (ICC)
- IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)
- IEEE International Conference on Smart Computing (SmartComp)
- IEEE International Conference on Sensing, Communication, and Networking (SECON)
- Wireless On-demand Network systems and Services Conference (WONS)
- International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)
- IEEE Conference on Local Computer Networks (LCN)
- IEEE Military Communications Conference (MILCOM)
- IEEE Global Communications Conference (GLOBECOM)
- The International Journal of Computer and Telecommunications Networking
- IEEE Journal of Selected Topics in Signal Processing (JSTSP)
- MDPI Sensors

TPC Member

- IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2025)
- IEEE International Conference on Computing and Machine Intelligence (ICMI)

Referees

Prof. Francesco Restuccia (Ph.D. Advisor)
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Department of Electrical and Computer Engineering
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Dr. Fikadu T. Dagefu (Internship Advisor)
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DEVCOM Army Research Laboratory
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Prof. Josep M. Jornet (Ph.D. Committee Member)
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Department of Electrical and Computer Engineering
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Prof. Ahmed Abdelgawad (MS Advisor)
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