résumé of **Sadia Afrose**

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EDUCATION

The Ohio State University (OSU)
Ph.D in Computer Science & Engineering (CSE) (August 2025 - Present)

Bangladesh University of Engineering & Technology (BUET)
B.Sc. in Electrical & Electronic Engineering (EEE) (March 2018 - May 2023)
Major: Communication & Signal Processing (CSP)

RESEARCH INTEREST

Wireless Communication | Next-generation Wireless Networks | Massive MIMO | Wireless Security | mm-Wave | Open RAN | 5G/6G Cellular Systems | Localization | Applied Machine Learning/Deep Learning | Signal Processing

RELEVANT COURSEWORK

Wireless Communications | Telecommunication Engineering | Communication Systems I & II | Computer Networks | Radar & Satellite Communication | Continuous Signals & Linear Systems | Digital Signal Processing I | Random Signals & Processes | Optical Communications | Intermediate Studies in Computer Networking | Advance Survey of Artificial Intelligence | Probability & Statistics

PROFESSIONAL EXPERIENCE

Graduate Fellow
Department of CSE, The Ohio State University (August 2025 - Present)

- Setting up a full 4G and 5G test environment using srsRAN, COATS UE, and SDR-based eNB/gNB/UE hardware
- Developing a 5G uplink SRS-based CSI collection pipeline using srsRAN + GNU Radio for real-time channel measurements and wideband channel prediction
- Designing 5G CSI-driven activity and gesture recognition frameworks
- Leveraging the POWDER platform (University of Utah) to orchestrate controlled 5G deployments for high-volume CSI collection and rigorous evaluation
- Building deep learning pipelines for CSI feature learning, wideband channel prediction, and robust RF signal understanding, enabling reliable AI-driven sensing in 5G/NextG systems

Senior Associate
Radio Access Network (RAN) Operations, Ericsson Network, Robi Axiata PLC (August 2023 - July 2025)

- Implemented preventive and corrective measures to ensure service quality, resource availability, and optimal radio network performance.
- Oversaw the execution of network changes and seamless integration of new technologies into live networks.
- Deployed advanced wireless technologies, including Massive MIMO systems and Antenna Integrated Radios, to boost capacity and throughput.
- Utilized automation and coding frameworks to enhance operational efficiency and optimize network performance.
- Collaborated with vendors, engineers, and cross-functional teams to resolve complex network issues and support business-critical projects.
- Actively engaged with emerging wireless technologies to drive innovation and ensure smooth adoption of advancements.

RESEARCH & PUBLICATIONS

B.Sc. Thesis: Efficient Defense Against First Order Adversarial Attacks on Convolutional Neural Networks. [Link]
Supervisor: *Dr. Hafiz Imtiaz, Professor, BUET*

- Proposed a computational-efficient approach to enhance the robustness of machine learning models against adversarial attacks, where inputs are purposefully altered to induce incorrect predictions. To achieve this, we focused on identifying the parts of the model that are most vulnerable to adversarial attacks and selectively trained only these sensitive components. This approach enabled us to achieve equivalent results comparable to conventional full-model adversarial training while using fewer resources, which ensures significant computational load savings.

Control Systems Project: Aquatic Robot for Trash Removal and Water Quality Monitoring Built from Recycled Materials - *13th International Conference on Electrical and Computer Engineering* (ICECE 2024). [Link]

AWARDS/HONORS

- Accepted, **CyberPowder Fellows Program** **2026**
  NSF-funded wireless networking hands-on training and research mentoring program led by University of Utah
- Recipient, **University Fellowship** **2025-2026**
  Awareded by The Ohio State University for exceptional academic qualification
- Recipient, **Best Paper Award** [Certificate] **2024**
  13^{th} International Conference on Electrical and Computer Engineering (ICECE 2024)
- Recipient, **Dean's List Scholarship** **2021-2023**
  Academic Honor by BUET for attaining CGPA of 3.75 for two consecutive terms
- Recipient, **University Merit Scholarship** **2021-2023**
  Academic Honor by BUET to the top 10% students of a department in a semester
- **Ranked-3^{rd}, Humanitarian Project Design Idea Contest** [Certificate] **2022**
  International Symposium on Social Implications of Sustainable Technology of IEEE Bangladesh Section Co-located Conferences
- Recipient, **Govt. Scholarship in Secondary School & Higher Secondary Certificate Examination** **2015-2022**
  Awarded by Ministry of Education, Bangladesh

TECHNICAL SKILLS

Operating Systems : Windows, Linux
Languages: Python | C/C++ | MATLAB | Assembly Language | Verilog HDL | Embedded C | Shell Scripting
ML Framework & Libraries: TensorFlow | PyTorch | Keras | Pandas | Numpy | Pandas
Simulation & Development Environments: Virtual Machine | Proteus | Arduino IDE | OpenStack
Network & Radio Tools: USRPs, GNU Radio, srsRAN, ENM (Ericsson Network Manager) | WinFOIL | Wireshark
Documentation: LaTeX | MS Office

HIGHLIGHTED PROJECTS

- **Vision Transformers for Micro Doppler Gesture Recognition on Dop_NET** [Repository]
  Introduced a transformer-based solution for radar-based hand gesture recognition from Doppler-Time spectrograms of the public DopNet dataset.
- **Open RAN-Based 5G Network Simulation** [Repository]
  Simulated virtualized 5G network environments using ZeroMQ, srsUE, gNB, Open5GS Core, O-RAN Near-RT RIC, KPI-MON xApp, and CU-DU split configurations. Explored Open RAN, RAN deployment, UE/base station interactions, and data flow in controlled environments.
- **Covid-19 Prediction in Bangladesh Using Deep Learning Algorithm** [Repository]
  Forecasted the number of daily COVID-19 cases occurring in Bangladesh using various machine learning models like Fbprophet, LSTM, and MLP, and comparing their performances.
- **IoT Based Remote Heart Rate Monitoring System** [Repository]
  Developed an ECG monitoring system using IoT, where heart rate data was processed via Arduino and MATLAB, then transmitted to the IoT cloud and notified to the concerned person via email.
- **Gas Leak Detection and Explosion Prevention with Air Quality Monitoring System** [Repository]
  Designed an ultimate engineering solution against gas leak explosions by detecting gas leaks and taking preventive measures such as limiting them and alerting the user via a mobile phone call. Air quality measurements were also taken.
- **Intelligent Gesture Based Security System** [Repository]
  Designed a contactless security system that is unlocked by means of a stored hand gesture pattern. The simulation was performed using MATLAB, VSPE, Arduino, and Proteus.