Mikdam-Al-Maad Ronoue

warrickronoue310899@gmail.com
+880-1676010806
Dhaka, Bangladesh
Personal Website
Google Scholar
GitHub
LinkedIn

Education

- **Master of Science in Robotics and Mechatronics Engineering** Apr 2024 - Present
  University of Dhaka, Bangladesh

  CGPA: **4.00/4.00** (Thesis pending)

  Relevant Coursework:
  - Bio Robotics
  - Computational Human-Robot Interaction
  - Computer Vision
  - Internet of Things
  - Automotive Control and Simulation
  - Industrial Automation

- **Bachelor of Science in Robotics and Mechatronics Engineering** Jan 2019 - Mar 2024
  University of Dhaka, Bangladesh

  CGPA: **3.93/4.00**, Ranked 1^{st}

  Relevant Coursework:
  - Introduction to Robotics
  - Artificial Intelligence
  - Introduction to Machine learning
  - Object Oriented Programming
  - Digital Signal Processing
  - Digital Image Processing and Robot Vision
  - Power Electronics and Drives
  - Advanced Mechatronics Engineering
  - Linear Algebra
  - Mathematical Analysis

Research Interests

Bio-medical Signal Processing, Machine Learning, Wearable and Assistive Devices, Embedded Systems, Smart Agriculture, Internet of Things (IoT) in Agriculture.

Research Experience

- **Research Assistant** Jan 2025 - Present
  MAIM Lab, University of Dhaka, Bangladesh
  Funding: Wellcome Leap (In Utero), California, USA
  PI: Dr. Niamh Nowlan, Co. PI: Dr. Abhishek Kumar Ghosh

  - Collaborated with University College Dublin researchers on 'Wellcome Leap' funded project titled 'Translation of a Wearable Fetal Movement Monitor towards Stillbirth Prevention' to develop a wearable device to monitor fetal movements (FM) to reduce stillbirth
  - Collected data using the bio-medical sensor device (belt) from non-pregnant participants in various environments
  - Implemented machine learning-based approach to address the limitations of traditional thresholding techniques in detecting FM signals and extracting features from bio-medical sensor data
  - Devised and optimized an algorithm to detect fetal hiccup from FM signals. The detected fetal hiccup rates (0.1 - 0.19 bouts/hour across sensor types) aligned well with the established literature (0.17 – 0.2 bouts/hour), validating the devised algorithm.

- **Research Assistant** Jan 2023 - Jan 2024
  University of Dhaka, Bangladesh
  Funding: Bangladesh Ministry of Posts, Telecommunications and Information Technology, Dhaka, Bangladesh
  PI: Mikdam-Al-Maad Ronoue, Co. PI: MD. Sameer Iqbal Chowdhury

  - Proposed a resource-efficient automated hydroponics system equipped with IoT capabilities.
  - Designed and proposed a novel algorithm to mitigate erroneous sensor data registered by microcontrollers, effectively reducing instances of subsequent erroneous actuation.
  - Completed writing one scientific manuscript for publication.

Publications

- Abhishek K. Ghosh, **Mikdam-Al-Maad Ronoue**, Ravi Vaidyanathan, and Niamh C. Nowlan. Variability in Fetal Movement Patterns Captured by Different Wearable Sensors. In *IEEE SENSORS JOURNAL,* 2025.**(Manuscript submitted)**
- MD. Sameer Iqbal Chowdhury*, **Mikdam-Al-Maad Ronoue***, Md Asaduzzaman, and Lafifa Jamal. Design of an IoT-enabled Scalable Closed Hydroponics System with Intelligent Parameter Control and Persistent Sensing Error Resilience. In *Smart Agricultural Technology,* 2024.**(Manuscript submitted)**
  (*Authors contributed equally as joint first authors) Paper Link

Projects

- **IoT-enabled Scalable Closed Hydroponics System with Smart Parameter Control** Jan 2023 - Jan 2024
  Topic: Internet of Things
  - Designed and implemented an IoT-based scalable closed hydroponics system.
  - Monitored and controlled physical parameters required for plant growth (pH, Electrical Conductivity, CO2, Humidity, Air Temperature, and Water Temperature).
  - Designed and proposed a novel algorithm to mitigate erroneous sensor data registered by microcontrollers, effectively reducing instances of subsequent erroneous actuation.
  - The proposed system led to a 78% to 288% increase in fresh mass yield, compared with two control groups: one using the conventional soil-based technique while the other used the Deep Water Culture (DWC) technique.
- **Positional Dynamics in Human–Robot Interaction: A Study with NAO** Aug 2023 - Nov 2023
  Topic: Human-Robot Interaction
  - Programmed the NAO Robot with various interactive behaviors (Greeting, introducing itself, singing a song, etc.)
  - Recorded interactions with humans using the interactive behaviors using an overhead camera.
  - Used Tracker software to track human spatial positioning.
  - Analyzed human spatial dynamics to verify Edward T. Hall's Proxemics Zones in HRI.
- **2 DOF, Single Claw Crawler Bot using Q-learning** Oct 2022 - Nov 2022
  Topic: Reinforcement Learning
  - Designed and built a 2 Degree-of-Freedom (DOF), single-claw crawler robot.
  - Implemented Q-learning to determine the best sequence of servo angles for maximum displacement.
  - Utilized epsilon-greedy algorithm to ensure faster convergence of Q-learning.
  - Crawler bot learned the actions needed to crawl forward much faster than naive exploration and did not enter any actuation loops.

Research Grants

- ICT Innovation Fund of the Information and Communication Technology (ICT) Division under the Bangladesh Ministry of Posts, Telecommunications and Information Technology for the 2023-2024 Fiscal Year (Principal Investigator: **Mikdam-Al-Maad Ronoue** and Co-Principal Investigator: MD. Sameer Iqbal Chowdhury) (Project ID: 1280101-120008431-3631108)

Awards and Scholarships

- Government Honours General Scholarship (Awarded for outstanding performance in Bachelor's 2022 batch), University of Dhaka, 2024
- 61 Engineers Club Trust Fund Scholarship (Awarded for achieving "First Class First" position in Bachelor's), University of Dhaka, 2023
- 1st, Intra-Department Soccer Bot Championship, University of Dhaka, 2019

Technical Skills

- **Programming Languages:** Python, C/C++, MATLAB, LaTeX
- **Frameworks & Libraries:** Arduino, ESP32
- **IoT & Embedded Systems:** Microcontrollers, Sensors, Actuators, IoT Protocols
- **Robotics:** ROS, Robot Kinematics, Control Systems, Sensor Integration
- **Tools:** Git, AutoCAD, Fusion 360, PCB Design
- **Professional:** Technical Writing, Research Methodology, Project Management

Leadership/Volunteer Activities

- **President** Mar 2022 – Feb 2024
  RMEDU Student Club, University of Dhaka
  - Successfully organized and supervised frequent cultural events, sports events, and competitions
  - Arranged and delegated paper reading sessions, workshops, and training sessions
  - Addressed numerous concerns and issues of the student body and issued relevant responses

- **Vice-Chair** Jul 2021 – Apr 2024
  IEEE Robotics & Automation Society, University of Dhaka
  - Directed and facilitated several webinars, interactive sessions, and expert talks
  - Collaborated with other IEEE societies across the country and accelerated IEEE RAS DU membership by 15%

- **Academic Team Mentor** Sep 2019 – Aug 2022
  Bangladesh Robot Olympiad
  - Developed questions for the National Robotics Olympiad and organized workshops
  - Helped materialize the National Robotics Olympiad for 4 years