KHONDOKAR RADWANUR RAHMAN

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EDUCATION

B.Sc in Electrical & Computer Engineering

Rajshahi University of Engineering & Technology

Relevant Coursework: *Data Structures & Algorithms, Operating Systems, Database Systems, Discrete Mathematics, Microprocessors, Computer Networks, Machine Learning*

Mar 2022- May 2026(Expected) Rajshahi, Bangladesh

CGPA: 3.25

EXPERIENCE

Qatar University

Research Assistant

February 2025 - Present Remote

- Conducted advanced research on **multiphase systems** using **Physics-Informed Neural Networks (PINNs)** for data-driven physical modeling.
- Developed and analyzed **Large Language Models (LLMs)** and **multimodal learning** frameworks, integrating heterogeneous data sources for improved representation learning.
- Designed and experimented with **Federated Learning** pipelines to enable privacy-preserving, distributed training across decentralized datasets.
- Tech Stack: **PyTorch, TensorFlow, Weights & Bias.**

BengalSub

Software and Autonomous System Developer

March 2025 - Present Hybrid

- Led the **Software and Autonomy Team** for **Hangor 1.0 AUV** in **RoboSub 2025 (Irvine, USA)**, developing the complete autonomous control and perception system.
- Designed mission visualization and control interfaces in **MATLAB**, and implemented a robust communication pipeline across **Raspberry Pi, Jetson Orin Nano, and Pixhawk**.
- Integrated **YOLOv8 with OpenCV** for real-time underwater object detection using front-facing and downward-facing cameras.
- Developed the autonomy stack in **Python** using **MAVLink**, structured with a **Behavior Tree** for reliable mission planning and execution.
- Tech Stack: **Python, Linux, OpenCV**

BengalBoat

Autonomy System Developer

November 2025 - Present Hybrid

- Leading the **Software and Autonomy Team** to develop an **autonomous surface vessel** for the **RoboBoat competition** organized by RoboNation (Sarasota, Florida, USA).
- Designing and implementing the vessel's **full autonomy pipeline** using a **ROS 2–based software architecture** for perception, planning, and control.
- Integrating multi-sensor perception using **Intel RealSense D455 depth camera** and **2D LiDAR** for environment understanding and navigation.
- Developing and validating autonomy behaviors in a **Gazebo simulation environment**, enabling mission execution and system-level testing prior to deployment.
- Tech Stack: **ROS2, Python, Linux, OpenCV**

TECHNICAL SKILLS

- **Programming Languages**: C/C++, Python.
- **Frameworks and Libraries**: PyTorch, TensorFlow, Scikit-Learn.
- **Database**: MySQL.
- **Tools**: Git, Postman.

ACHIEVEMENTS

- **6th Place Worldwide** — Mars Autonomous Rover Rally Challenge, **Texas Space Grant (NASA)**, representing Bangladesh as Team Lead of **RUET Exover** (Nov 2025).
- **32nd Place Worldwide** - 28th Annual **International RoboSub Competition**, Irvine, California, USA, representing Bangladesh with **Team BengalSub** (Aug 2025).
- **Qatar 3X Research Grant Awardee** - Qatar University. Fields: Digital Twin, Deepfake Detection, Disaster Response.
- **15th Place Globally** out of 355 teams — **Global AI Hackathon 2025**, Elucidata.
- **7th Place (National Round)** out of 135 teams — 5th International **KIBO Robot Programming Challenge**, led **Team n0Brains**.
- **2nd Place Winner** — **University Innovation Hub Program (UIHP)**, Rajshahi; received **pre-seed funding** (Team MosQuitt).
- **3rd Place Nationwide** among 100+ teams — **Smart Rajshahi Innovation Challenge** (Team Best_Trio).

PROFILES

Kaggle - redo1

LeetCode - radwan121

Codeforces - radwan1210 [Highest Rated - Pupil (1216)]

Research Gate - Khondokar Radwanur Rahman

RESEARCH

- **Multi-Task Physics-Informed Neural Networks for Flow Regime Classification and Automated Video Retrieval in Multiphase Systems.**
  Journal: IEEE Transactions on Instrumentation & Measurement
- **Multiphase System Leak Detection, Localization, and Dimension Estimation using Multi-Head Physics-Informed Neural Networks.**
  Journal: Process Safety and Environmental Protection (Q1)
- **ReliefNet: A Knowledge-Driven, Explainable AI Multimodal Framework for Disaster Severity Classification and Humanitarian Decision-Making.**
  Journal: Progress In Disaster (Q1)
- **RoadSens-4M: A Multimodal Smartphone Camera Dataset for Holistic Road-way Analysis.**
  Journal: Scientific Nature Data