

# NAZIB ABRAR

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## EDUCATION

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**Rajshahi University of Engineering & Technology** March 2022 - Present  
BSc in Mechatronics Engineering — Expected Graduation Date May 2026

**Notre Dame College** July 2018 - August 2020  
HSC from Science — GPA 5.00

## WORK EXPERIENCE

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**Embedded Systems Engineer (Contract) — Aethes Armor (USA)** March 2025 - Present

- Engineered a Debian based custom embedded Linux distribution for a security locker device using the **Yocto Project**, including writing custom device drivers and patching the kernel.
- Developed the device's core firmware, implementing **WebRTC** for live video-calling and **Websockets** for real-time control of peripherals.
- Integrated computer vision and **AI** functionalities using **TensorFlow-Lite** to enable intelligent device operations.
- Built the complete web backend and server infrastructure for the system using **Django**.
- Contributed to the hardware development lifecycle by assisting in **PCB** design reviews and Bill of Materials (BOM) generation.

**Junior Software Developer (Part-Time) — FronTech Limited** June 2023 - October 2025

- Created well-documented libraries in **C++** for JRC Board (an ESP32-based microprocessor development board) to ensure compatibility with Arduino shields.
- Led back-end development of a scalable alumni management system using **Django Rest Framework** and **PostgreSQL**.
- Integrated **RabbitMQ** and **Celery** to handle asynchronous tasks, enabling efficient processing of time-consuming operations. Deployed the project in a microservice architecture using **Docker**, emphasizing scalability and seamless deployment.
- Led the back-end development for the "smartschoolbus.gov.bd" project, a B2B solution built with **NodeJS**, **Express**, and **MongoDB** to improve school bus safety and efficiency for over 2,500 active users.
- Managed **VPS** infrastructure, utilizing **Nginx** for traffic routing and access control, and implemented **CRON** jobs for automated database backups.
- Implemented live video streaming in **RTMP** and **HLS** protocol.

## PROJECTS

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**CORTEX-Health: An AI Assistant for Medical Practitioners (PyTorch, FastAPI, OpenCV)**

- Developed a **FastAPI**-based API server to facilitate communication between an Android application (built with Flutter) and machine learning models. Used **PostgreSQL** as the database.
- Trained three YOLO-v8 models using **PyTorch** for disease diagnosis from medical images (e.g., X-RAY and CT scan reports).

**CORTEX Robotic Arm Controller Software (PyQT, OpenCV, Matplotlib)**

- Created **Python**-based software for controlling robotic arms using forward and inverse kinematic algorithms.
- Developed a GUI with **PyQT** to control and simulate robot movement with a 3D **Matplotlib** graph.
- Designed a custom hardware stabilization algorithm, increasing load-carrying capacity by 5%.
- Implemented computer vision-based environmental awareness and object detection using **OpenCV**.

## LEADERSHIPS AND AWARDS

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**Secretary of Programming Dept — Notre Dame Information Technology Club**

- Led programming-related affairs, including contests and tutoring sessions for junior members.

**Champion– 6<sup>th</sup> Kibo RPC Bangladesh Regional Round 2024**

- Achieved 1<sup>st</sup> position in the Bangladesh selection round of the Kibo RPC competition, developing software to control a free-flying robot in zero gravity. Employed computer vision techniques for navigation and task execution.

### **Global 11<sup>th</sup> Position – International Rover Design Challenge 2023**

- Contributed to Team Ogrodoot's best performance on IRDC by implementing computer vision based mars terrain segmentation system using SAM and designing inverse kinematics algorithm for robotic arm of the rover.

### **First Runner-Up - Phitron Show Your Project Contest 2022**

- Won the project showcase competition with CORTEX Robotic Arm Controller Software.

### **Champion - DRMC Tech Carnival 2020**

- Won the Line Follower Robot racing competition using "Thunder," an LFR controller software developed with C++.

### **Finalist - Code Samurai 2024 (Hackathon)**

- Advanced to the final round in a competitive field of 400+ teams, achieving 14th place in the Code Samurai 2024 Hackathon with an end-to-end solution for municipal solid waste management.

### **PROBLEM-SOLVING EXPERIENCE**

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- Solved 85+ problems on LeetCode following the Neetcode.io roadmap, gaining a strong understanding of diverse data structures and algorithms. [\[Profile Link\]](#)
- Codechef Rating 1550. [\[Profile Link\]](#)

### **CERTIFICATES**

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#### **Machine Learning Specialization**

Issued by: Stanford Online

September 2023

### **REFERENCES**

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#### **Saiam Bin Islam**

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