Muhammed Humam Hossain

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EXPERIENCE

Production Intern | Square Textiles PLC Aug 2025 – Oct 2025
Gazipur, Dhaka

- Analyzed large-scale production ecosystems and monitored key performance indicators (KPIs), gaining a comprehensive understanding of process reliability and high-throughput system management.
- Studied industrial automation logic and root-cause analysis methodologies, examining the correlation between variable inputs and system performance to understand data-driven quality control.

PROJECTS

Industrial Environmental Quality & Hazard Detection System | LINK

- Developed a comprehensive sensor network using **Arduino Mega 2560** as the MCU, integrating multiple environmental sensors (MQ gas sensors, DHT22 humidity & temperature sensor, DSM501A particulate matter sensor, flame sensor) for real-time hazard detection with integrated user interface including OLED display, control buttons, LEDs, and buzzer for independent operation.
- Developed complete web infrastructure with **Django** REST API backend using **SQLite** database for data ingestion and timestamped storage, **React** frontend featuring real-time monitoring dashboard with interactive charts and hazard analysis capabilities, and end-to-end data pipeline utilizing **ESP8266 WiFi module** as a communication bridge between the standalone hardware device and web infrastructure, enabling seamless data transmission via AT commands over UART and processing sensor readings from Arduino HTTP POST requests through API validation to live client-side visualization updates.

Cortex Robotics - 6th Kibo RPC Autonomous Flight System | LINK
Champion Project (Regional) & International Finalist | Role: Team Lead & System Architect

- Architected a fault-tolerant **Android control system (Java)** for NASA's Astrobee robot, implementing stateful mission logic with advanced recovery mechanisms for zero-gravity environments.
- Engineered a hybrid computer vision pipeline integrating **OpenCV** for image pre-processing (undistortion, sharpening) and a quantized **YOLOv11 model (TensorFlow Lite)** for real-time, on-device object detection.
- Developed a unified simulation environment using **Python, Tkinter, and Docker**, automating the end-to-end workflow from code compilation to cloud-based mission log analysis.
- Conducted rigorous performance profiling using **Pandas** and **Matplotlib** to minimize mission runtime.

SKILLS

- **Programming & Development:** Python, C/C++, Java, SQLite, Arduino, ESP32
- **Data Science & ML:** OpenCV, Scikit-learn, Pandas, Matplotlib, PyTorch, RSL-RL, Stable Baseline3, PyBullet
- **Productivity & Documentation:** LaTeX, Notion, Microsoft Office (Word, Excel, Powerpoint, Access)
- **Languages:** English (Proficient), Bengali (Native)

EDUCATION

B.Sc. in Textile Engineering **March 2022 - Present**
Bangladesh University of Textiles, Dhaka, Bangladesh
Expected Graduation Date March 2026

AWARDS

Champion - 6th Kibo RPC Bangladesh Regional Round 2025

- Secured the Championship title in the Bangladesh Regional Round, qualifying to represent Bangladesh in the International Final Round at the JAXA Tsukuba Space Center, Japan.