Shaownak Shahriar

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Summary

I am a Computer Science graduate from BRAC University with extensive experience in robotics and autonomous systems, having led high-impact projects like Mars Rovers, AUVs, and UAS missions. My background includes hands-on leadership in planning shift-based operations, managing hardware-software integration, and ensuring system uptime in real-time environments. I specialize in control systems, sensor fusion, and process optimization, with a proven ability to lead diverse teams and deliver under pressure. I am now eager to apply this operational and technical expertise to drive production efficiency, support maintenance, and contribute to BAT's vision of operational excellence.

Education

BRAC University, School of Data Science **Graduated in 2024**
Bachelor of Science in Computer Science *Dhaka, Bangladesh*

- **Notable Courses:** Quantum Computing, Artificial Intelligence, Neural Networks, Introduction to Robotics, Pattern Recognition, Software Engineering, System Analysis and Design

Experience

Dubotech **May 2024 – October 2024**
Autonomous Systems Engineer *Dhaka, Bangladesh*

- Operated AUVs from base station, coordinating testing cycles and ensuring system readiness.
- Reduced downtime by optimizing integration of Pixhawk, Jetson Orin Nano, and sensor modules.
- Enhanced real-time monitoring using GAN-based underwater video enhancement algorithms.

BRACU Duburi **June 2021 – April 2024**
Sub-Team Lead, AI and Machine Vision *Dhaka, Bangladesh*

- Led vision and control system development for autonomous underwater vehicle operations.
- Reduced failure rates through real-time diagnostics, sensor fusion, and proactive maintenance.
- Deployed YOLO/SSD models on embedded devices for object detection in real-time missions.
- Tuned PID controllers and ROS-based navigation to improve maneuverability and stability.

BRACU Mongol-Tori **January 2022 – August 2023**
Senior Engineer, Autonomous Systems and AI *Dhaka, Bangladesh*

- Built SLAM and mapping systems using LiDAR, IMU, and GPS for terrain navigation.
- Designed motor control strategies and ensured uptime across deployment phases.
- Integrated hardware-software systems using ROS for seamless robotic coordination.

Technical Skills

Programming: Python, C, C++, Arduino – for embedded systems, automation, and control logic
Embedded Systems & Control: Pixhawk, Jetson Nano, Raspberry Pi, ESP32; PID tuning, sensor fusion (Kalman/Madgwick); real-time control systems
Operational Tools: ROS, SLAM, Linux, system diagnostics, shift-based task scheduling, run-time monitoring
Computer Vision: OpenCV, YOLO (v3–v8), SSD MobileNet, Faster R-CNN, Mask R-CNN; GAN-based enhancement for performance visibility
Sensors & Interfaces: IMU, GPS, RTK, VectorNav, LiDAR, depth sensors – calibrated and integrated for stability and accuracy
Process & Leadership: Cross-functional coordination, downtime minimization, systems integration, performance optimization
Others: Git, LaTeX, ASP.NET, Django, MySQL – for documentation, version control, and auxiliary system support

Projects

Leadership & Automation

- **BRACU RaptorX** (Dec 2023 – Dec 2024) – Co-founded BRACU RaptorX for UAS research; led the Autonomous & Navigation team to develop Bangladesh's first autonomous VTOL quad plane. Managed hardware-software integration, autonomous flight tests, and team coordination. Successfully deployed the system in real-world flood rescue missions for aerial support and situational assessment.
- **Shurokkha Rescue Bot** (Nov 2023) – Designed and developed an autonomous robot for disaster response with real-time object detection, aerial mapping, and localization to simulate emergency recovery operations.
- **Gas Flow Controller System** (Sep 2023 – Oct 2023) – Built an IoT-based gas leak detection and safety system with automated shut-off valves, real-time alerts, and remote monitoring capabilities.

Systems & Control

- **MPU6050 Sensor Fusion with Kalman Filter** (Dec 2022) – Implemented a motion tracking system using sensor fusion and Kalman filtering for enhanced accuracy in system diagnostics. GitHub
- **Object Detection & Navigation with CV and Arduino** (Feb 2022) – Developed a simple autonomous navigation system using computer vision and Arduino for obstacle avoidance and basic mobility tasks. GitHub

Operations Software

- **ERP Software for E-commerce** (Expected Dec 2024) – Developed a modular ERP platform using ASP.NET MVC for inventory, order, and customer management, with a focus on streamlining workflows and operational reporting. GitHub

Achievements

- Participated in **IMechE UAS Challenge 2024** – Bracu RaptorX, IMechE (Leicester, England)
- First Runner-up (Globally) at **ROBOSUB 2023** – Bracu Duburi, RoboNation (San Diego, California, USA)
- Participant in **University Rover Challenge (URC) 2023** – BRACU Mongol-Tori, The Mars Society (Utah, USA)
- 7th Position (Globally) in **International Rover Challenge (IRC) 2023** – BRACU Mongol-Tori, The Space Robotics Society (Bangalore, India)
- 3rd Position in **International Kibo Robot Programming Competition 2022 (Bangladesh Round)** – JAXA (Dhaka, Bangladesh)
- 3rd Position in **BRACU Intra University Programming Contest 2021** – BRAC University (Dhaka, Bangladesh)

Academic Thesis and Research

Point-Cloud-based 3D Object Detection for Autonomous Navigation in Unmanned Ground Vehicles
May 2023 – October 2024

- Our research focuses on improving 3D object detection for autonomous Unmanned Ground Vehicles (UGVs) by addressing the limitations of traditional 2D detection methods. We propose a two-stage pipeline that leverages point cloud data to generate 3D object proposals, followed by a fusion of GLENetVR and SE-SSD architectures for accurate detection. This hybrid approach enhances spatial understanding, improving object distinction and recognition in complex environments. Through extensive evaluations on benchmark datasets, our model demonstrates superior accuracy, surpassing both standalone SE-SSD and GLENetVR models, contributing to safer and more reliable UGV navigation.

Research Mentorship

- **Smart Driver Safety System based on driver Drowsiness Detection, Car Lane detection and Depth estimation** (July 2023 – October 2023)
- **Breast Cancer Detection by fusing SSD MobileNet v2, VGG16 and ResNet with KNN, Random Forest and XGBoost** (November 2022 – December 2022)
- **Underwater waster detection on muddy water by fine tuning Yolo v5, v7 and EfficientDet-D0** (October 2023 – January 2024)

Other Notable Experiences

Robotics Instructor, BRAC University **May 2022 - August 2023**

BRAC University

- Worked as a robotics instructor for the course "Introduction to Robotics" offered at BRAC University for three consecutive semesters.
- Served as a robotics instructor at the BRAC Hope Fest hosted by BRAC University in June 2023.

Robotics Club of BRAC University (ROBU) **January 2020 - December 2023**

Senior Executive of Strategic Planning

- Served as a robotics instructor for workshops such as "Basics of Robotics."
- Conducted several workshops on "Introduction to Computer Vision" and "Introduction to Autonomous Systems."
- Built and maintained strong connections within the robotics and academic community.

References

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Additional references available upon request.