Mollah Md Saif

Research Assistant — AI/ML — Robotics

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Summary

Research Assistant in robotics and AI, seeking a PhD position in intelligent systems research. Experienced in developing AI-powered bioinformatics pipelines and advancing research on autonomy and multi-sensor perception at BRAC University, where I also mentor undergraduate students. Published work on autonomous navigation (ICRA 2025) and led a university rover team in international competitions. Proficient in Python, C++, ROS, and core AI/ML frameworks (TensorFlow, PyTorch, Keras). Dedicated to applying advanced AI techniques and rigorous experimentation to impactful academic research.

Education

BRAC University *Jan 2020 – Sep 2024*

BS in Computer Science, Dhaka, Bangladesh

- CGPA: 3.65/4.0
- Research Focus: Computer Vision, Autonomous Systems, System Automation, IOT
- Honors: VC's List for Academic Excellence (7 Semesters), Dean's List for Academic Excellence (1 Semester)

Notre Dame College *2017 – 2019*

High School Diploma, Science, Dhaka, Bangladesh

Publication

Autonomous Navigation in Crowded Spaces Using Multi-Sensory Data Fusion

2025 IEEE International Conference on Robotics and Automation (ICRA) [**A* Conference**]

Presented in Atlanta, USA, May 2025

DOI: 10.1109/icra55743.2025.11127865

Research Experience

Research Assistant *Sep 2025 – Present*

BRAC University

- Mentored undergraduate thesis students in robotics, perception, and AI from concept to defense.
- Led R&D of AI-driven autonomy and perception systems for unstructured environments with robust ML and computer vision models.
- Collaborated with faculty on prototype development, ML pipeline optimization, benchmarking, and publication preparation.
- Advised BRACU Mongol Tori on robotics strategy, knowledge transfer, and international competition readiness.

Team Lead *Nov 2021 – Jun 2023*

BRACU Mongol Tori (University Rover Team)

- Led a 40-member team through the full lifecycle of designing, building, and competing internationally with a Mars rover simulation.
- Designed and implemented the rover's core software architecture using ROS, C++, and Python from scratch.
- Developed and optimized key software components, including control systems and inverse kinematics for robotic arm.
- Integrated autonomous science module and an RTK-GPS mapping system into the rover's WebUI.
- Engineered the autonomous navigation stack enabling waypoint traversal and obstacle avoidance using sensor fusion within the ROS framework.

Undergraduate Research Assistant *Jul 2022 – Oct 2022*

Laboratory of Space System Engineering & Technology (LaSSET)

- Designed a microcontroller-based architecture and deployed optimized deep learning models for on-board image classification on a 2U CubeSat.
- Researched, selected, and integrated an industrial camera system for high-quality image capture and processing.
- Conducted in-depth analysis of multispectral cameras to evaluate their suitability for machine learning applications.

Experience

Embedded Systems and Software Engineer *Jul 2024 – Mar 2025*
Sa.Ni.Corporate Srl, Rome, Italy (Remote)

- Developed hardware and software for medical baropodometry devices.
- Designed Windows automation tools (Powershell) for process streamlining.
- Optimized a C++ medical visualization application through reverse engineering.

Artificial Intelligence Intern *Jul 2023 – Jan 2024*
Genofax®, Dhaka, Bangladesh

- Learned and implemented AI/Deep Learning Models (TensorFlow, Keras, Scikit-Learn) in healthcare systems, including feature engineering and data preprocessing for large-scale medical datasets.
- Developed an AI-enabled bioinformatics pipeline for taxonomic classification and profiling of bacteria.
- Designed and implemented big data processing pipelines for training machine learning models on AWS.

Projects

LangChain Chatbot API *nekosaif/langchain-chatbot-api* *Jan 2025*

- Developed a production-ready chatbot backend API using Python, FastAPI, LangChain, and OpenAI GPT models.
- Implemented custom FAQ training functionality, supporting PDF, TXT, and CSV document loading and embedding.
- Utilized FAISS for efficient vector similarity search to retrieve relevant FAQ answers.

Multi-Agent Pathfinder for Optimal Path Selection of Multiple Fog Robot *Nov 2023 - Mar 2024*

- Developed algorithms for efficient path generation, collision avoidance, and dynamic obstacle handling.
- Integrated YOLOv8 for real-time object detection and AR tags for precise robot localization using OpenCV.
- Explored reinforcement learning (DQN, PPO, MARL) for adaptive and scalable navigation in simulations.
- Conducted simulations and real-world experiments, analyzed system performance, and documented findings.

Skills

Programming Languages: Python, C/C++, Java, R, Bash, PowerShell, SQL
AI / Data Science: TensorFlow, PyTorch, Scikit-learn, Keras, LangChain, Pandas, NumPy, NLP, Computer Vision, Deep Learning, Reinforcement Learning, Vector Databases (FAISS), Bioinformatics Pipelines
Embedded Systems / Robotics: ROS, Arduino, Raspberry Pi, ESP32, FreeRTOS, Embedded C/C++, Control Systems, Inverse Kinematics, Path Planning (CBS), Gazebo, Sensor Integration, PCB Design (Autodesk Eagle, Proteus), Circuit Design & Debugging, Power Electronics, Satellite Systems (CubeSat), LTSpice
Web Development: Flask, REST APIs, HTML5, CSS, JavaScript, PHP, MySQL, NoSQL
Software & Tools: Git, Docker, CI/CD, Windows Automation, Reverse Engineering, AWS, Agile Methodologies, Linux
Professional: Team Leadership, Project Management, Technical Documentation, Critical Thinking, Communication

Honors & Awards

- **16th Place**, University Rover Challenge, The Mars Society, Utah, USA (Jun 2023)
- **National Round Champion**, KIBO Robot Programming Challenge, JAXA, Tokyo, Japan (Apr 2023)

Certificates & Training

- **IBM Data Science Professional Certificate**, IBM, Coursera (2025)
- **Python 3 Programming Specialization**, University of Michigan, Coursera (2020)
- **Java Programming and Software Engineering Specialization**, Duke University, Coursera (2020)

References

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