# Mollah Md Saif

Computer Science Graduate — AI/ML — Robotics

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## Summary

Machine Learning enthusiast, seeking a challenging PhD position focused on intelligent systems research. Proven ability to design and implement innovative software solutions, demonstrated through developing AI-powered bio-informatics pipelines and sophisticated medical device software. Applied these skills extensively in robotics, culminating in published research on autonomous navigation (ICRA 2025) and leadership of a university rover team in international competitions. Proficient in Python, C++, ROS, and core AI/ML frameworks (TensorFlow, PyTorch, Keras). Eager to contribute advanced AI techniques and robust software engineering skills to cutting-edge research in a rigorous academic environment.

# Education

## **BRAC** University

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

High School Diploma, Science, Dhaka, Bangladesh

## Publication

## Autonomous Navigation in Crowded Spaces Using Multi-Sensory Data Fusion

Accepted to: 2025 IEEE International Conference on Robotics & Automation (ICRA) [A\* Conference] Status: To be presented in Atlanta, USA, May 2025

## Experience

## Embedded Systems and Software Engineer

Sa.Ni.Corporate Srl, Rome, Italy (Remote)

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

## Artificial Intelligence Intern

#### Genofax (B, 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.
- $\circ$  Researched personalized healthcare, focusing on genetics, human nutrition, and microbiome-derived diagnosis.
- Developed an AI-enabled bioinformatics pipeline for taxonomic classification and profiling of bacteria.
- $\circ~$  Designed and implemented big data processing pipelines for training machine learning models on AWS.
- Worked with conversational AI and chatbot development (Flask, Jinja).

## **Research Experience**

## Team Lead

BRACU Mongol Tori (University Rover Team)

- $\circ\,$  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.
- $\circ$  Developed and optimized key software components, including control systems and inverse kinematics for robotic arm.
- $\circ~$  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.

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2017 - 2019

Jan 2020 - Sep 2024

Jul 2023 – Jan 2024

Nov 2021 – Jun 2023

Jul 2024 – Mar 2025

#### **Research Assistant**

Jul 2024 - Sep 2024

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.
- Tested and validated the performance of the system in simulated space conditions, ensuring reliability and efficiency.

#### Projects

#### ${\bf LangChain\ Chatbot\ API\ O\ } nekosaif/langchain-chatbot-api$

- 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.
- $\circ~$  Containerized the application using Docker for easy deployment and scalability.

#### Automated Installation Scripting **Q** nekosaif/patient\_entry\_setup

- Developed an automated installer for complex "PatientEntry" medical software with numerous dependencies.
- $\circ~$  Authored PowerShell scripts for silent installation of the main application and prerequisites.
- Integrated pre-execution tasks (SQL cleaning) and program startup routines using converted Batch-to-EXE files.
- Packaged all components into a user-friendly Self-Extracting (SFX) archive configured for automated script execution upon extraction to the temp directory.

#### 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.
- Configured microcontrollers, and established reliable robot-server communication (REST APIs).
- Conducted simulations and real-world experiments, analyzed system performance, and documented findings.

#### Skills

Programming Languages: Python, C/C++, Java, R, Bash, PowerShell, SQL

AI / Machine Learning / Data Science: TensorFlow, Keras, PyTorch, Scikit-learn, Pandas, NumPy, Matplotlib, Seaborn, OpenCV, Computer Vision, Reinforcement Learning, Data Preprocessing, Feature Engineering, Bioinformatics Pipelines, Predictive Analytics

Web Development: HTML5, CSS, JavaScript, PHP, Flask, Jinja, REST APIs, MySQL, Web Scraping Software Development & Tools: Git, Docker, CI/CD, Windows Automation, Reverse Engineering, GUI Development (PyQt), Jupyter Notebooks, Linux (Ubuntu, Raspbian), ROS, AWS, Agile Methodologies

#### 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

#### Dr. Md. Golam Rabiul Alam, PhD

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#### Salman Ibne Eunus

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Jan 2025