# Nasim Mahmud Mishu

Website | Linkedin

Email: nasimmahmud1301@gmail.com

Mobile: +(88) 01754316419

## RESEARCH INTEREST

My research interests lie at the intersection of **robotics and artificial intelligence**, with a particular focus on **swarm intelligence, AI-driven robotic systems, and computer vision**. I am also interested in CAD-based robotic design, motion planning for autonomous navigation, and the integration of perception and control mechanisms to enhance intelligent decision-making in robotic agents.

## EDUCATION

- **North South University** Dhaka, Bangladesh
  *Bachelor of Science in Computer Science and Engineering* May 2017 – December 2021
  *CGPA: 3.39/4.00 (87–89%)*
  **Thesis Title: Autonomous Obstacle Avoiding Exploring Robot (AOAVER)**

## EXPERIENCE

- **Research Assistant** Dhaka, Bangladesh
  *NSU Intelligent Robotics (NIRO) Laboratory* October 2024 – Present
  *Dept. of Electrical and Computer Engineering, North South University*
  **Supervisor:** Dr. Shahnewaz Siddique
  **Research Area:** Swarm robotics with a focus on centralized and decentralized control systems
  **Primary Assignments:**
  - Investigated swarm robotics architectures under centralized and decentralized control strategies.
  - Integrated machine learning techniques to enhance swarm behavior, coordination, and adaptability.
  - Designed experiments for evaluating swarm performance in dynamic environments.

- **Teaching Assistant** Dhaka, Bangladesh
  *Dept. of Electrical and Computer Engineering, North South University* January 2025 – Present
  **Courses:** Spring'25 (EE494/ CSE495A: Introduction to Robotics)
  Summer'25 (EE494/ CSE495A, CSE543: Introduction to Robotics)
  **Primary Assignments:**
  - Supported course delivery on robotics fundamentals (kinematics, motion planning, perception, control).
  - Assisted students through tutorials, homework evaluation, and project guidance.
  - Helped with exam invigilation and grading to maintain academic integrity.

- **Part-time Research Assistant** Dhaka, Bangladesh
  *Dept. of Electrical and Computer Engineering, North South University* December 2023 – June 2024
  **Supervisor:** Dr. Shahnewaz Siddique
  **Research Area:** Resource-efficient visual Deep Reinforcement Learning (DRL) for autonomous agents and robots.
  **Primary Assignments:**
  - Developed custom datasets for feature extraction in vision-based tasks.
  - Applied ML models for segmentation-based vision in autonomous agents.
  - Benchmarked approaches to improve resource efficiency in DRL models.

- **Founding Member** Dhaka, Bangladesh
  *NSU Ignite North South University* September 2018 – February 2022
  **Primary Assignments:**
  - Designed and constructed remote-controlled and autonomous robots for competitions.
  - Conducted hands-on workshops to train and inspire new robotics enthusiasts.

## PROJECTS

- **NIRO Educational Bot** October 2024 – Present
  - Developed an educational robot at NSU Intelligent Robotics (NIRO) Lab to support hands-on learning and research.
  - Integrated core components (gyroscope, IR sensors, motors, WiFi) with Raspberry Pi and Arduino.
  - Designed a customizable 3D-printed chassis and PCB, enabling hardware extensions.
  - **Tech used:** Raspberry Pi, Arduino, 3D Printing, PCB Design

- **Project Hex** February 2025 – Present
  - Designed a hexapod robot with six legs (3 DOF each) for robust mobility on uneven terrain.
  - Integrated 18 high-torque bus servo motors, powered by LiPo battery for extended operation.
  - Implemented Arduino-based real-time control with modular support for Raspberry Pi and sensors.
  - **Tech used:** Arduino, High-torque Servo Motors, LiPo Battery, Modular Robotics Design

- **Autonomous Obstacle Avoiding Exploring Robot (AOAVER)** Summer 2021 — Spring 2022
  - Designed and developed an autonomous robot for search and rescue in disaster-prone areas.
  - Implemented obstacle avoidance and exploration algorithms for hazardous environments.
  - Integrated sensors and controllers for real-time perception and decision-making.
  - **Tech used:** Python, YDLidar X4, Raspberry Pi 3 B+, Arduino UNO, Linux OS, ROS

- **Assist Seniors and Disabled with Hand Gesture Recognition** Spring 2020
  - Built a low-cost hand gesture recognition system to assist elderly and disabled individuals.
  - Enabled emergency calling through gesture-based interaction using a mobile app.
  - Applied computer vision for reliable gesture detection and recognition.
  - **Tech used:** Python, OpenCV, Raspberry Pi 3 B+, Pi-camera, Firebase, Android Studio

## PUBLICATIONS

### Special Proceedings

- Haque, Ridwanul, Md. Saif Ahammod Khan, **Nasim Mahmud Mishu**, Rahat Jahangir Rony, and Nova Ahmed. "Understanding the Healthcare Sector in Bangladesh: Experiences and Services during the COVID-19 Pandemic." ***6th Asian CHI Symposium 2022***, Apr. 2022, New Orleans, LA. North South University, Bangladesh. [ISBN]

### Journals & Research Papers

- Neloy, Asif Ahmed, Rafia Alif Bindu, Sazid Alam, Ridwanul Haque, Md. Saif Ahammod Khan, **Nasim Mahmud Mishu**, and Shahnewaz Siddique. "Alpha-N-V2: Shortest Path Finder Automated Delivery Robot with Obstacle Detection and Avoiding System." ***Vietnam Journal of Computer Science***, vol. 7, no. 4, 2020, pp. 373–389. World Scientific. [DOI]

- Neloy, Asif Ahmed, Rafia Alif Bindu, Sazid Alam, Ridwanul Haque, Md. Saif Ahammod Khan, **Nasim Mahmud Mishu**, and Shahnewaz Siddique. "Alpha-N: Shortest Path Finder Automated Delivery Robot." *Asian Conference on Intelligent Information and Database Systems* ***(ACIIDS 2020)***, edited by Ngoc Thanh Nguyen et al., vol. 12034, Springer, 2020, pp. 217–228. Lecture Notes in Computer Science. [DOI].

## REFERENCES

- **Dr. Shahnewaz Siddique**
  *PhD, Georgia Institute of Technology, Atlanta, Georgia, USA*
  Associate Professor
  Dept. of Electrical and Computer Engineering, North South University
  Google Scholar | Email: shahnewaz.siddique@northsouth.edu