Mitanshu Goel

Robotics Engineer | Embedded Systems

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INTRODUCTION

Robotics engineering student with practical experience across the full project cycle from hardware design and simulation to building and programming robotic systems. Skilled in developing real-time control systems for robotic arms and legged robots using ROS/ROS2, and in programming microcontrollers in C++ for embedded applications.

WORK EXPERIENCE

Nextup Robotics - Robotics Intern **July 2024 - September 2024**

- Developed control algorithms in ROS to improve the robotic arm's speed and precision.
- Automated calibration of arm movements through software routines, achieving high accuracy and smooth motion.

SarthakAI - **AI and Robotics Intern** **June 2025 - August 2025**

- Designed an automated sorting system integrating computer vision and robotics for efficient package handling.
- Built a sensor network using Raspberry Pi and ESP32 devices for data collection and analysis.
- Developed a voice-controlled AI assistant with NVIDIA NeMo to enable hands-free system commands.

EDUCATION

B. Tech (ECE) at Maharaja Agrasen Institute of Technology, Delhi **November 2022 - Current**

- Pursuing Electronics and Communication Engineering with minor in specialization in AI/ML.
- Active participation in tech and cultural events as coordinator/participant

SKILLS

- **Programming Languages:** Python, C++, C, JavaScript
- **Robotics:** ROS, Gazebo, MoveIt, Ros2 Control, OpenCV, YOLO
- **Embedded Systems:** Raspberry Pi, ESP32, Arduino, Embedded C
- **Tools:** Docker, Git, Fusion 360, Linux

PROJECTS

6 DOF ROBOTIC ARM (GITHUB)

- Designed and built a 6-degree-of-freedom robotic arm, including mechanical assembly and stepper motor calibration.
- Programmed the arm's motion using ROS and created a web interface with live video feedback for remote operation
- **Tech Stack:** ROS, MoveIt, Gazebo, Python, C++, JavaScript, OpenCV

HEXAPOD (GITHUB)

- Designed and simulated custom gait algorithms in ROS2 and Gazebo, using inverse kinematics to achieve stable multi-legged locomotion.
- Deployed the real-time control system on physical hardware using a Raspberry Pi, managing the software stack within a containerized Docker and ROS2 environment.
- Tech Stack: ROS2, Gazebo, Rviz, Raspberry Pi, Docker, Python, Fusion 360, ROS2 Control

SENTINEL

- Engineered a mesh-network safety system using ESP32 microcontrollers, developing C++ firmware to establish a self-relaying message chain via the ESP-NOW protocol for offline environments.
- Integrated fall detection and gas sensors to automatically transmit alerts upon detecting hazards.
- **Tech Stack:** ESP32, ESP-NOW, C++, Python, Arduino IDE, MPU6050, Gas Sensors

POSITION OF RESPONSIBILITY

Core Member A.T.O.M (Robotics Society) **October 2023 - Present**

- Worked on robotics projects and represented the college in national and international competitions like Robocon and International Rover Design Challenge.
- Helped organize workshops, tech events, and project demonstrations on campus