Mitanshu Goel

Robotics Engineer | Software Developer

mitanshug2004@gmail.com +918595657583 mitanshu.me mitanshu-2004

INTRODUCTION

I am a software developer and robotics engineer with experience in web development, AI tools, and robotic systems. I have built applications using MERN, FastAPI, and Firebase, and worked on AI models with NVIDIA NeMo and Sentence Transformers. On the robotics side, I have designed and programmed robotic arms and legged robots using ROS/ROS2, MoveIt, and Gazebo, and integrated them with custom web interfaces for real-time control. My work spans both software and hardware, and I have gained practical skills through internships, hackathons, and robotics competition

EDUCATION

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

- Pursuing minor specialization in AI/ML.
- Active participation in tech, entrepreneurship, and cultural events as coordinator/participant

Schooling at Vikas Bharati Public School, India **April 2007- June 2022**

- Scored 85 percent in 10^{th} Class (March 2020)
- Pursued PCM and scored 80 percent in 12^{th} Class (June 2022)

SKILLS

- **Languages:** Python, C++, JavaScript
- **Web & Backend:** FastAPI, React, Node.js, Express
- **Databases:** MongoDB, ChromaDB, Firebase Firestore
- **AI & ML:** NVIDIA NeMo, Sentence Transformers, Vector Search, OpenCV
- **Robotics:** ROS/ROS2 (MoveIt, Gazebo), Motion Planning, Inverse Kinematics
- **Hardware & Tools:** Raspberry Pi, ESP32, Arduino, Docker, Git, WebSockets, Fusion 360

WORK EXPERIENCE

Robotics Intern **July 2024 - September 2024**

Nextup Robotics

- Implemented control solutions for a robotic arm within the ROS framework to perform complex, time-sensitive tasks.
- Created and deployed motion planning algorithms that improved the robot's speed and responsiveness.
- Calibrated and refined the arm's movements, achieving a high degree of accuracy and fluid motion.

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

SarthakAI

- Deployed a local, voice-controlled AI assistant on workstations using NVIDIA NEMO for hands-free command processing.
- Developed a scalable sensor network with a Raspberry Pi server and multiple ESP32 clients to collect and centralize precise operational data.
- Implemented a vision-based package detection system and integrated it with robotic motion planning to fully automate the sorting process.

PROJECTS

6 DOF ROBOTIC ARM

- Designed, assembled, and programmed a 6 DOF robotic arm with stepper calibration and ROS-based control.
- Built a browser-based control panel with real-time video feedback and WebSocket-based command execution, enabling remote teleoperation and real-time diagnostics of a 6 DOF robotic arm.
- **Tech Stack:** Arduino Mega, ROS, MoveIt, Python, C++, JavaScript, WebSockets, OpenCV

HEXAPOD

- Simulated and validated hexapod locomotion in ROS2/Gazebo using inverse kinematics and custom gait algorithms for stable multi-legged walking.
- Deployed real-time control algorithms on physical hardware via Raspberry Pi and Dockerized ROS2 environment.
- **Tech Stack:** ROS2, Gazebo, Rviz, Raspberry Pi, Docker, Python, Fusion 360, ROS2 Control

MEMORY VAULT

- Built a personal memory assistant app to save, search, and organize memories and notes.
- Developed backend with FastAPI, supporting AI-based memory creation, retrieval, file storage, tagging, and vector search using ChromaDB.
- Created React frontend for smooth organization, semantic search, tagging, and quick access to memories.
- **Tech Stack:** FastAPI, Python, ChromaDB, Sentence Transformer React, JavaScript, HTML/CSS.

POSITION OF RESPONSIBILITY

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

Maharaja Agrasen Institute of Technology, Delhi, India

- 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

---