

ADNAN AMIR

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EDUCATION

Northeastern University

Master of Science in Robotics

Sep. 2023 – Dec. 2025

Boston, MA

NMIMS University

Bachelors of Technology (Honours) in Mechatronics with minor in Robotics and IoT

Jul. 2019 – Jul. 2023

Mumbai, India

EXPERIENCE

Nordson Corporation

Robotics and Automation Engineer

May. 2024 - Jan. 2025

- Reworked the most critical subsystem of the assembly line for the company's top-selling product, working with drives, **PLCs, sensors and pneumatics**, increasing uptime by 25% through **flexible automation** and optimal workflow
- Developed and deployed on an **Allan Bradley PLC**, a visual inspection AOI using **Keyence cameras**, leveraging **computer vision and deep learning** to detect defects, reducing scrap rate by 2% and enhancing product quality
- Led efforts as a **Subject Matter Expert** in a Rapid Improvement event, utilizing **lean manufacturing tools** within a cross-functional team to boost operational efficiency, reducing production bottlenecks and waste

Automata Systems

Robotics Intern

May. 2023 - Jul. 2023

- Developed the software stack and technical documentation for using **EtherCAT** communication protocol with **Raspberry Pi & Panasonic Drives**. using bash scripts and **Linuxcnc – RT**, a low latency OS (Similar to RTOS)
- Designed and Implemented **Debian based RTOS firmware** for a real-time **six-axis robot controller** using C++ and EtherCAT, testing on a custom robot arm hardware prototype which received funding for manufacturing

SKILLS

Programming Languages: Python, C++, MATLAB, C, LabView, Inform III, Codesys and Allan Bradley ladders and ST

Softwares: Fusion360, Solidworks, LABView, Proteus, Gazebo, Simulink, Coppeliassim, Isaac Sim

Tools & Libraries: ROS1/2, Moveit1/2, Pandas, Tensorflow/Pytorch/JAX, QT creator/Tkinter, Orocos-KDL/Drake, cvxopt/Gurobi/Ceres, Linux, Git, Eigen/numpy, OpenCV, gymnasium, Isaac Sim/Gym

Soft Skills: Team Leadership, Public Speaking, Communication skills, Critical Thinking, Cognitive Flexibility

PROJECTS

Precise Air Sealing Robot for Inaccessible Spaces – P.A.R.I.S

Northeastern University

May. 2025 – Present

Working on a **Unitree go2** quadruped mounted with a **Kinova Jaco** to navigate confined spaces in construction sites, mapping out the area and detecting thermal and visual defects and fixing them. Software stack uses **LIO-SLAM with nvblox** for scene reconstruction, **ICP** for pointcloud fusion and **NVIDIA Lula RMPflow** for motion planning on the arm

Navigation under Uncertainty using RL

Northeastern University

Feb. 2025 – Apr. 2025

Developed a **vectorized** differential-drive robot environment and implemented **SAC** (auto-entropy, twin critics) and **PPO** variants (CLIP/KL) with parallel training—achieving 90 % success (SAC) and 70 % success (PPO-CLIP). Transferred the learned policy to an agent in **Isaac Sim** which can be used to control a real robot

Mars Rover (Hardware Project)

NMIMS University

Jul. 2022 – Aug. 2023

Engineered from concept to prototype, a versatile mobile manipulator with a 4WD base, 5 DOF arm, A KinectV2, **Orbbec 2D Lidar**, IMU, **Garmin GPS**, Temp/Humidity & Soil sensor. Capable of navigation via **ROS Nav** and 3D mapping via **RTAB**. Hardware design included a rocker bogey, 20" tubed tires and Aluminum 6061 chassis

Patrol Bot: Autonomous Security Robots (Hardware Project)

NMIMS University

Jul. 2021 – Aug. 2023

Engineered an inconspicuous surveillance bot designed as a **low-cost** add-on to CCTV systems, automating nightshift monitoring. The system as a whole is implemented as a **swarm** of robots, communicating via **IOT** and using a custom person detection dataset trained on **Inception-V2** for night vision cameras.

PUBLICATIONS

Design and Implementation of an IoT-Based Patrol Robot

2022

IEEE Bombay Section Signature Conference (IBSSC), Mumbai, India, 2022, pp. 1-6 doi: 10.1109/IBSSC56953.2022.10037325

Design and Analysis of Strawberry-Picking Industrial Robotic Arm

2022

IEEE Bombay Section Signature Conference (IBSSC), Mumbai, India, 2022, pp. 1-6 doi: 10.1109/IBSSC56953.2022.10037337