

Neer Patel

New York, NY

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Summary

I am a passionate Mechatronics and Robotics Engineer with a strong foundation in electronics, software, and control systems. Currently pursuing my Master of Science at New York University, I bring hands-on experience in developing Autonomous Underwater Vehicles (AUV), advanced mechatronic systems, robotic arms, embedded electronics, and autonomous robotic solutions.

Education

Master of Science, Mechatronics and Robotics Engineering

New York University, NY

Sep 2025 – Present

Coursework: Foundation of Robotics, Mathematics for Robotics, Mechatronics, Advanced Mechatronics, Robot Localization & Navigation

Bachelor of Technology, Electronics and Instrumentation Engineering

Nirma University, Ahmedabad

Aug 2021 – May 2025

PPI (scale of 10): 8.20

Coursework: Fundamentals of Image & Video Processing, Image Processing & Its Applications, Programming with Python & MATLAB, Machine Learning, Computer Programming, Operation Research, Microprocessors and Microcontrollers, Industrial Electronics, Process Control, Control System Design, Electrical & Electronics Measurement, Data Communication and Industrial Networking, Industrial Instrumentation, Industrial Drives & Control

Higher Secondary Certificate (12th GSHEB)

The National High School, Ahmedabad

Apr 2021

Percentage: 73/100

Senior Secondary Certificate (10th GSHEB)

Swastik Academy, Ahmedabad

Apr 2018

Percentage: 92/100

Internship & Project Experience

Team Nirma AUV (Autonomous Underwater Vehicle)

Engineering Trainee

Dec 2021 – Apr 2022

- Assisted in fabrication and water-proofing of the main hull in the machine.
- Learned C, Arduino IDE, Embedded Systems, and Python.

Embedded Systems & Control System Engineer

Apr 2022 – Sep 2022

- Learned about flow of data and control between Arduino microcontroller and Python for sensor fusion and parameter analysis.
- Understood positional stability using PID control and tuning methods for robust robot control.
- Applied sensor fusion with Pressure, IMU, and ultrasonic sensors for precise vehicle positioning.
- Programmed motors for task-specific orientations in the Singapore AUV Challenge.

ROS Programmer

Sep 2022 – Mar 2023

- Developed AgastyaOS for autonomy missions of Singapore AUV Challenge and GUJCOST Robofest 3.0.
- Executed Gazebo simulations for AUV testing and validation.
- Proficient in ROS for seamless communication between robotic components.
- Worked on NVIDIA Jetson boards, Raspberry Pi, and Intel NUC Boards.
- Agastya 2.0 won AMUROVc 2023 National Champions.

Vice Captain, Software Head & Team Lead Manager

Mar 2023 – Apr 2024

- Led testing and benchmarking of an algorithm with a team of three software engineers. Used Python and MATLAB for comprehensive assessments on diverse matrices.
- Built underwater image enhancement and dehazing pipeline for low-cost camera.
- Utilized YOLOv7 in ML and DL implementation for precise underwater object detection at SAUVC, attaining an accuracy milestone of 86.2%.
- Utilized Embedded Linux for efficient Computer Vision (CV) applications, optimizing performance and integration with embedded systems.
- Implemented wireless control through an acoustic-based frequency detector, enabling remote communication and control functionalities.
- Managed a team of 18 individuals to design and develop a fully capable AUV for SAUVC'24, Robosub'24 (USA), & Teknofest'24 (Turkey).
- Responsible for managing the team's budget and finances, as well as overseeing and coordinating the mechanical, electronics, and software sub-divisions.

Team Mentor (R&D)

Apr 2024 – May 2025

- Led R&D direction for next-generation Agastya-class AUVs with focus on autonomy robustness, multi-sensor fusion reliability, and hydrodynamic performance.
- Mentored sub-teams on improving mission planning algorithms, thruster characterization, underwater CV generalization, and embedded system resilience.
- Conducted design reviews, supervised architecture refactoring of AgastyaOS, and established standardized testing protocols for simulation-to-water validation.

GUJCOST Robofest 3.0 (Underwater/Submarine Category project funded by Dept. of Science & Technology, Govt. of Gujarat)

- Cleared Stage-1 Ideation and received INR 50,000 for POC.
- Developed NV-23 ROV with wireless VNC control.
- Finalists in Stage-2 and received INR 2,00,000 for prototype.
- Conducted extensive R&D on underwater thruster efficiency by experimenting with different motor-propeller-motor driver combinations..
- Achieved National Runner-Up title and INR 7,50,000 prize.
- NV-23 displayed at Robotics Gallery, Science City.

Intuitive Motion Control of a Robotic Arm Using a Wearable IMU-Based System

Guide: Dr. Dipak Adhyaru, Nirma University, India

Developed a wearable IMU-based system with multi-sensor fusion and custom orientation estimation to intuitively control a 6-DOF robotic arm in real time, using ESP8266 and matrix-based inverse transformations for teleoperation and assistive robotics.

UR10e Robotic Arm-Based Drive-Through Order Tending System

Guide: Dr. Dipak Adhyaru, Nirma University, India

Integrated a UR10e robotic arm system with Python-based software, using traditional computer vision and QR code decoding. It prevents spillage in drive-throughs by adapting movements for liquid orders.

Treasurer & Events Head, Nirma Robotech Club

Mar 2023 – Apr 2024

- Managed finances and budgets for workshops and hackathons; designed and marketed events via social media, flyers, and campus promotions.
- Designed and coordinated industry-relevant technical workshops with MATLAB and Ansys, enhancing hands-on exposure for 100+ students.

Student Manager, Tinkerers' Lab (Maker Bhavan Foundation)

Mar 2023 – Apr

2024

- Mentored students on 3D printing, laser cutting, and PCB milling; facilitated 20+ prototypes in a year through structured resource management.
- Led interdisciplinary outreach and workshops to foster hands-on innovation and guide idea-to-prototype development.

Patents & Publications

Publication: Vision-Based Robotic Manipulation using QR Code Detection and Cartesian Control on UR10e

2025 IEEE International Conference on Compute, Control, Network & Photonics (ICCCNP)

DOI: 10.1109/ICCCNP63914.2025.11233819

Patent: Acoustic Controlled Underwater Vehicle

Status: Filed Dec 2023 (pending publication)

Skills

Image Processing, ROS, Machine Vision/Computer Vision, Embedded Systems, PLC Programming, Digital Image Processing, 3D Printing, Rapid Prototyping, Analytical Thinking, Testing & Debugging, Team Management, Project Finance & Budgeting

Software & Languages

- **Programming & Simulation:** Python, C/C++, MATLAB/Simulink, ROS1/ROS2, Gazebo, HTML, Bash Scripting, Unix systems, OpenCV, YOLO, Keil μ Vision, LabVIEW
- **Frameworks/Hardware:** Arduino, Teensy, STM32, Raspberry Pi, Jetson Boards, ESP8266, Git/GitHub, React.js
- **Design Tools:** Eagle PCB, Fusion 360, Blender, 3D Printing, Rapid Prototyping, Adobe Illustrator, Photoshop, Canva
- **Productivity & Management:** MS Office, Google Workspace, Notion, OBS Studio

Certificates, Awards & Honors

- **Singapore AUV Challenge (Apr 2025)** – Runner Up internationally among 82 teams.
- **Singapore AUV Challenge (Apr 2024)** – Finalist
- **Singapore AUV Challenge (Sep 2022)** – Ranked 7th internationally among 93 teams.
- **Certificate of Honour** – Nirma University (**2022, 2023, 2024**) for contributions to robotics.
- **Winner** – **AMUROVc 2023** – National Champions, INR 25,000.
- **Runner-Up** – **GUJCOST Robofest 3.0 (2023)** – INR 7,50,000 prize.
- **Certificate of Academic Excellence** – Nirma University – Sem V (9.30 SPI), Sem VII (9.13 SPI), Sem VIII (10 SPI)