

Aditya Raj Maheshwari

Roll No.:21BEI001

B.Tech - Electronics and Instrumentation Engineering

Institute of technology Nirma University

+91-7984900436

21bei001@nirmauni.ac.in

adityaraj.arm@gmail.com

linkedin.com/in/aditya-maheshwari-arm/

github.com/MahessBhai/

EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech. Electronics and Instrumentation Engg.	Nirma University	7.4(Current)	2021-Present
Senior Secondary	CBSE Board	90.4%	2021
Secondary	CBSE Board	91.5%	2019

PROJECTS

- **SUAS 2024 (Team Captain)** June 2024
AUVSI SUAS 2024: Maryland USA, Domain: ODCL(object detection classification and localization), Lua Scripting
 - Led a team of 7 to develop a high speed multi-rotor under 25kg with autonomous navigation, classification, localization and payload delivery capabilities.
 - The multi-rotor was designed to cover a path of 15 miles in under 30 minutes while performing the given mission hence maintaining a cruise speed of 18m/s.
 - Manually tuned the copter to achieve high speed stable flights even in strong wind conditions.
 - Implemented a real time queue based object detection, classification and autonomous navigation pipeline.
 - Reduced inference time by firstly running a detection algorithm and then implemented HOG transforms and template matching for accurate classification taking into account for perspective errors and rotation variance in-place of multi class object detection model.
 - Achieved 20% reduction in processing time enhancing mission efficiency and reliability.
- **Mission Chandra** Sept. 2023
SAC ISRO Ahmedabad, Domain: Microcontroller integration and UI development
 - Worked with a team of 4 to develop a 1:200 scale of two-stage Chandrayan-3 launch vehicle with parachute recovery.
 - Used Arduino nano with burn wire setup for rocket separation and parachute deployment.
 - Used barometer sensor and saved real time telemetry data logs on SD card connected to onboard Arduino along with sending to ground station.
 - Created a WPF application using C# which acts as ground station and displays real time telemetry data and required graphs.
 - Developed failsafe mechanisms in case of any in-flight error to safeguard the onboard electronics.
- **Aerathon 2023 (Team Captain)** Nov. 2023
Domain: Systems Engineer
 - Lead a team of 10 to develop a multirotor under 2kg with autonomous navigation and payload delivery capacity of 200g along with identification of four hotspots.
 - Worked with NVIDIA's Jetson Xavier NX and ArduCam 12MP camera.
 - Developed custom trained YOLOV5 algorithm for target detection and hotspot identification.
 - Developed algorithm to prevent same hotspot detection due to hotspot being identical in nature.
- **SUAS 2023** June. 2023
AUVSI SUAS 2023: Maryland USA, Domain: Machine Learning and Autonomous Navigation
 - Worked with a team of 10 to develop a multirotor under 25kg with autonomous navigation and five payload delivery each weighing 500g and cover path of 12miles under 30minutes.
 - Worked on NVIDIA's Jetson Xavier NX and Viewpro Q10F 14MP camera.
 - Employed a custom trained improved YOLOV5 based algorithm with transformer prediction head.
 - Developed a new autonomous navigation algorithm for payload dropping with 0.1m accuracy.
- **Aerathon 2022** Nov. 2022
Domain: Machine Learning
 - Worked with a team of 10 to develop a multirotor under 2kg with autonomous navigation and payload delivery capacity of 200g.
 - Worked with NVIDIA's Jetson Xavier NX and ArduCam 12MP camera.
 - Used custom trained YOLOV5 algorithm for target detection.
 - Developed a relative navigational algorithm for payload delivery.

TECHNICAL SKILLS

- **Programming:** C/C++, Python, C#
- **Databases:** MySQL
- **Operating System:** Windows, Linux
- **Other:** Data Structures and Algorithms(DSA), Keras, Tensorflow, Pytorch, ROS, OpenCV, Database Management System(DBMS), Object Oriented Programming in python, mavlink, dronekit, Arduino, Image processing, Streamlit

KEY COURSES TAKEN

- **Mathematics:** Calculus, Linear Algebra and Ordinary Differential Equation-I, Complex Analysis and Differential Equations-II, Numerical Methods
- **Electrical Course:** Circuit Theory, Basic electronics, Control theory, Industrial Electronics, Electrical and Electronics Measurement, Control System Design, Linear Integrated Circuits, Signals and Systems, Process Control, Transducers and Measurement
- **Computer Science:** Computer Programming, Machine Learning, Microprocessors and Microcontrollers, Cloud Computing, Data Science, Programming with Python and Matlab, Object Oriented Programming, Data Structures, Image Processing and its applications, Deep Learning for Vision Systems, Operating System, Soft Sensors, Software Engineering

POSITIONS OF RESPONSIBILITY

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| • General Secretary , SAE Nirma Collegiate Club , Nirma University | <i>Jan. 2024 - Present</i> |
| • Team Captain , Team Arrow, Nirma University | <i>Apr. 2023 - Present</i> |
| • Computer Systems Lead , Team Arrow , Nirma University | <i>Nov. 2022 - Present</i> |
| • Member , SAE Nirma Collegiate Club , Nirma University | <i>Jul. 2022 - Jan. 2024</i> |
| • Member , Student Chapter of the Computer Society of India , Nirma University | <i>Aug. 2021 - Present</i> |

ACHIEVEMENTS

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| • Rank 3 internationally , AUVSI SUAS 2024, Maryland, USA | <i>Jun. 2024</i> |
| • Qualified for finales , Mission Chandra, SAC ISRO Ahmedabad | <i>Sept. 2023</i> |
| • Rank 5 internationally , AUVSI SUAS 2023, Maryland, USA | <i>Jun. 2023</i> |
| • Rank 5 , SAE Aerothon 2022, Bangalore | <i>Nov. 2022</i> |
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