Aditya Raj Maheshwari

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B.Tech - Electronics and Instrumentation Engineering
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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 inplace of multi class object detection model.
  – Achieved 20% reduction in processing time enhancing mission efficiency and reliablity.

- **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.

- **Aerothon 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 hotsopt 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.

- **Aerothon 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

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

Positions of Responsibility

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

Achievements

- **Rank 3 internationally**,AUVSI SUAS 2024, Maryland, USA *Jun. 2024*
- **Qualified for finales**,Mission Chandra, SAC ISRO Ahmedabad *Sept. 2023*
- **Rank 5 internationally**,AUVSI SUAS 2023, Maryland, USA *Jun. 2023*
- **Rank 5**,SAE Aerothon 2022, Banglore *Nov. 2022*