

Sairaj Rajendra Loke

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EDUCATION

• Indian Institute of Technology Indore

Nov. 2021 - July 2025

- **Major:** Computer Science & Engineering
- **Additional Learning:** IoT for Space Applications

CGPA: 8.37/10

EXPERIENCE

• Undergraduate Research Intern- Autonomous Underwater Vehicle

Aug. 2023- Present

under guidance of [Prof.Konstantinos Alexis](#) along with [Mihir Dharmadhikari](#) , [Mohit Singh](#).

[ARL](#) - NTNU - Norway

- Developed a ROS wrapper for the HoloOcean Simulator.This is being used for generating datasets in rosbag format and handling the vehicle using existing ros packages [Demo1](#). [Demo2](#).
- Working on Encoding Depth Information using beta-VAEs to be used for Navigation Task.

• Soyabean Leaf Disease Classification - under RuTAG- Govt. of India

Jul. 2023 - Sept. 2023

under guidance of [Prof.Aruna Tiwari](#)

[Certificate](#) - [Kaggle](#) - IIT Indore

- Implemented traditional image augmentation techniques: rotations, blurring of different kinds, shadow, flares, and lot more, for 6 diseases + 1 healthy leaf class on existing 770 images to generate x9 times images to be used further.
- Reviewed and tried out GANs for Data Augmentaion, custom as well as models like CycleGAN.
- Quality of Generated images were qualitatively evaluated using perceptual studies.

PROJECTS

• IITIHub- Institute App

Jan. 23 – Apr. 23

Software Course Project, under Prof. Puneet Gupta, CSE, IIT Indore, CS258

[Github](#)

- Followed principles of Incremental software development process, to develop flutter and firebase-based android application from scratch for IIT Indore community.
- Features: Student-Professor project collaboration, Automatic Email Categorization, Campus news & Campus map.

• Python API for Controlling Drona Aviation's Pluto Drone (Bronze Medal)

Dec. 22 – Feb. 23

Inter IIT TechMeet 11.0, IIT Kanpur

[Presentation](#) - [Certificate](#) - [Github](#)

- Features: Achieved real-time performance using Multithreading and Multiprocessing.(2 simultaneous vision and control processes).
- Developed a system to support simultaneous control of multiple drones.
- Communication using Sockets.Used PID for Trajectory Control.
- 4 Tasks included: Hovering, Rectangular motion, Localisation using OpenCV and ArUco marker, Drone Swarm Control, all using the API we built. Worked in a group of 10 undergraduates.
- Special Appreciation for our waypoint sampling (interpolation of targets) for better trajectory control.

• GestureGo- Gesture Controlled Car

Feb. 23

[Github](#)

- 21 Hand landmarks were extracted using Mediapipe's Hand Landmark Detection model.
- Developed a light Neural network using TensorFlow Framework to classify gestures based on 21 key points recognized from Mediapipe's inferences, achieved an fps of 30.
- Commands were sent to ESP32 to control the car appropriately.
- Experienced a latency of about <0.5 sec

• Lidar Based Obstacle Avoiding Robot IIT Indore Summer of Code

Jul. 22 – Aug. 22

Team Lead

[Github](#)

- Developed a Robot (Simulation in Gazebo) which can move in its environment from the start point to a destination, avoiding STATIC (walls, tables, etc.) and DYNAMIC (moving people) obstacles using a Lidar (No vision camera involved). Used ROS as the middleware, Jackal robot along with Velodyne Lidar.
- Used local planners like TEB, after comparison with DWA, ElasticBand, etc.

KEY COURSES TAKEN

- **Mathematics:** Optimization Algorithms and Techniques, Numerical Approximations, Complex Analysis, Differential Equations, Linear Algebra, Basic Calculus,
- **Computer Science and Engineering:** Computer Networks, Operating Systems, Parallel Computing, Automata Theory & Logic, Data Structures and Algorithms, Software Engineering
- **Robotics & AI/ML:** Fundamentals of Reinforcement Learning, Neural Networks and Deep Learning, Hyperparameter Tuning, Regularization and Optimization., *check other Course Certifications.*

TECHNICAL SKILLS

- **Programming Languages:** C++, Python, bash, SQL, Dart, MATLAB *
- **OS & Platforms/Embedded devices:** Linux, RaspberryPi, Arduino
- **Robotics & AI Frameworks/Libraries:** ROS, ROS2, PyTorch, OpenCV, OpenMP
- **Simulators :** Gazebo(Classic + Ignition)* , HoloOcean
- **Others Frameworks/Libraries:** Git, Docker, Socket, Wireshark, Scapy, Flutter, Astrometrica, BOUML

* Elementary proficiency

POSITIONS OF RESPONSIBILITIES

- **Chair IEEE- RAS**, Student Branch Chapter, IIT Indore- [Prof. Trapti Jain \(Advisor\)](#) Nov. 22 - Present
Discussing latest robotics developments, series of ROS workshops beginner to advanced ([link](#))
- **Head- Autonomy Division**, IVDC Club, IIT Indore, IGVC team - Autonomy lead. Apr. 23 - Present
- **Member**, Cynaptics Club, IIT Indore Feb. 22 - Present
- **Member**, SIRC, International Relations Team (Students' International Relations Cell) Dec. 22 - Present

ACHIEVEMENTS

Year	Achievement	Associated With
2023	Bronze Medal , Inter IIT Tech Meet 11.0	IIT Kanpur
2022	Coder One , Team NotABot – ranked 12th Internationally	Coder One (Company)
2022	1st Place , IIT Indore Summer of Code-Lidar Based Obstacle Avoiding Robot	IIT Indore SoC
2021	All India Rank 1219 , out of 250,000 Students, Top 5 % Students	Jee Advanced
2021	Ranked in Top 0.21% , out of 1 million candidates	Jee Mains
2021	KVPY Fellow All India Rank (AIR) 165 , SX stream (12th Grade)	IISc, Bangalore.
2020	KVPY Fellow All India Rank (AIR) 534 , SA stream (11th Grade)	IISc Bangalore
2019	NTS Scholar–NCERT , (National Council of Education Research & Training)	New Delhi
2019	Silver Medalist , Dr.Homi Bhabha Young Scientist Exam	HBCSE/TIFR

VOLUNTEERING

- **MENTOR - Lane Detection using Limited Computation Power** Jun. 2023 - Jul. 2023
[IIT Indore Summer of Code](#) [Demonstration - Github-](#) IIT Indore
– Mentored 4 Juniors to Develop a robust lane detection pipeline that consumes meager computational resources.
– Will be integrated in our [IGVC's Autonomous Vehicle](#).
- **AVANA** Jun. 2022 - present
[Social Welfare Students' Club](#) IIT Indore
– Social welfare initiative taken up by students of IIT Indore for the welfare of underprivileged people nearby Indore.
– Conducting teaching sessions, and providing basic clothing, sweets, and stationery through donations for rural children/elderly.
– Visiting Orphanages, nursing homes and celebrating events with them- [\[LINK\]](#)