

SAIRAJ RAJENDRA LOKE

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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech.	Indian Institute of Technology Indore	8.47 (Current)	2021-2025
Senior Secondary	HSC (grade 12)	94.67%	2021
Secondary	SSC (grade 10)	95.00%	2019

EXPERIENCE

- **Environmental Robotics Lab(ERL) - ETH Zurich** | *Computer Vision & Robotics Intern* **Aug.24 - Present**
 - Developing an Optical/Scene Flow-based algorithm to estimate the rigidity of tree branches, utilizing data from a downward-facing camera mounted on a hovering drone to be used for sensor deployment.
- **Autonomous Robots Lab(ARL) - NTNU** | *Robotics Research Intern* **Oct.23 - Jul.24**
 - Developed a custom ROS wrapper for the HoloOcean simulator. This is being used for generating datasets in rosbag format and integrating the vehicle control with existing ROS packages. [Demo](#).
 - Worked on encoding depth information using beta-VAEs to be used for downstream underwater navigation tasks.
 - Achieved 500x compression ratio in depth representation with VAE's inference time of less than 1.6 milliseconds.
- **Big Data Lab - IIT Indore** | *Data Augmentation Intern* **Jul.23 - Sept.23**
 - 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 used GANs for data augmentation, 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 [Github](#)
 - Applied principles of incremental software development process, to design and build flutter and firebase-based mobile application from scratch targetted for IIT Indore community.
 - Features: student-professor project collaboration platform, automatic email categorization, campus news & 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](#)
 - Developed a comprehensive Python API based on multithreading and multiprocessing to achieve real-time performance for simultaneous vision and control processes. Established socket communication between the client computer and drone. Implemented waypoint navigation algorithm with visual feedback using ArUco markers.
 - Demonstrated hovering, waypoint navigation, localization, and drone swarm control utilizing the developed API.
- **Lidar Based Obstacle Avoiding Robot** **Jul. 22 – Aug. 22**
Team Lead, IIT Indore Summer of Code [Github](#)
 - Led a team of four undergraduates to develop a static and dynamic obstacle-avoiding robot simulation in Gazebo, utilizing ROS as the middleware with a Jackal robot and Velodyne Lidar.
 - Used Time Elastic Band(TEB) local planner, after comparison with Dynamic Window Approach and ElasticBand.

TECHNICAL SKILLS

- **Programming Languages:** C++, Python, Bash, Dart*, SQL*
 - **OS & Platforms/Embedded devices:** Linux, RaspberryPi, Arduino
 - **Tools/Frameworks/Libraries:** Git, Github, PyTorch, OpenCV, ROS/ROS2, Singularity(HPC Containerization), Sockets, Flutter, Docker*, OpenMP*, Wireshark*, BOUML*, Gazebo(Classic + Ignition)*, HoloOcean
- * Elementary proficiency

KEY COURSES TAKEN

- **Mathematics:** Linear Algebra, Optimization, Numerical Approximations, Differential Equations, Basic Calculus
- **Computer Science and Engineering:** Computational Intelligence, Computer Networks, Operating Systems, Data Structures and Algorithms, Software Engineering, Parallel Computing, Database and Information System, Automata Theory & Logic, Computer Graphics, Compiler Techniques
- **Online Courses:** Fundamentals of Reinforcement Learning, Neural Networks and Deep Learning, Hyperparameter Tuning, Regularization and Optimization, [other Course Certifications](#).

POSITIONS OF RESPONSIBILITY

- **Chair IEEE- RAS**, [Student Branch Chapter](#), IIT Indore- Prof. Trapti Jain (Advisor) **Nov. 22 - Present**
Discussions with industry professional on latest robotics developments, ROS workshops.[link](#)
- **Member, SIRC**, International Relations Team (Students' International Relations Cell) **Dec. 22 - Present**
- **Head- Autonomy Division**, [IVDC Club](#), IIT Indore, IGVC team - Autonomy lead. **Apr. 23 - Apr. 24**

ACHIEVEMENTS

- **ThinkSwiss Scholar 2024**, [Scholarship](#) for Fall 2024 internship at ETH Zurich **2024**
- **Bronze Medal**, Inter IIT Tech Meet 11.0, IIT Kanpur **2023**
- **Ranked 12th Internationally**, Team NotABot - CoderOne **2022**
- **Gold Medal**, IIT Indore Summer of Code-Lidar Based Obstacle Avoiding Robot **2022**
- **All India Rank 1219**, out of 151,000 Students, Ranked in Top 0.81 % Students, JEE Advanced **2021**
- **KVPY Fellow | All India Rank (AIR) 165**, SX stream (12th Grade) **2021**
- **NTS Scholar-NCERT**, (National Council of Education Research & Training) **2019**