

SAIRAJ RAJENDRA LOKE

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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech.	Indian Institute of Technology Indore	8.67 (Current)	2021-2025
Senior Secondary	HSC (grade 12)	94.67%	2021
Secondary	SSC (grade 10)	95.00%	2019

EXPERIENCE

- **Siemens, India** | 3D Reconstruction Intern Dec.24 - Present
 - Working on 3D reconstruction of real indoor warehouse objects and scenes based on multiple view image captures and their interactions within the AirSim simulator.
- **Environmental Robotics Lab(ERL) - ETH Zurich** | Bachelor's thesis, guided by [Prof. Stefano Mintchev](#) Aug.24 - Nov.24
 - Designed a novel Scene Flow(3D Optical Flow) based algorithm to estimate the loading capacity score of tree branches and associated uncertainty in the estimates.
 - Captured observed oscillations using data from a downward-facing RGBD camera mounted on a hovering drone to be used for sensor deployment.
 - Paper, Presentation, showcasing results on 3 reference branches
- **Autonomous Robots Lab(ARL) - NTNU** | Robotics Research Intern, guided by [Prof. Kostas Alexis](#) Oct.23 - Jul.24
 - Developed a custom ROS wrapper for the HoloOcean simulator. This is being used for generating data in rosbag format and integrating the vehicle control with existing ROS packages. [Demo](#).
 - Worked on encoding depth information using beta-VAEs for downstream underwater navigation tasks.
 - Achieved 500x compression ratio in depth representation with VAE's inference time of less than 1.6 milliseconds.

PROJECTS

- **Embedded Capture the Flag (eCTF), 2025** Jan. 25 – Apr. 25
International Competition by MITRE, team advised by [Prof. Gourinath Banda](#), CSE, IIT Indore
 - Collaborating in a team of 14 members, to Design and implement a Satellite TV system to securely encode and decode emulated satellite TV data streams while protecting against unauthorized access to protected tv channels.
 - Proposed channel-specific AES keys, leveraging AES Hardware Acceleration Engine on MAX78000FTHR.
 - As a member of the decoder (firmware) team, currently implementing decryption, UART communication with host computer and other decoder functionalities robust against various attacks on the MAX78000FTHR board in C.
- **IITHub- 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 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 created API.

TECHNICAL SKILLS

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

KEY COURSES TAKEN

- **Mathematics:** Probability and Statistics*, Linear Algebra, Optimization, Numerical Approximations, Basic Calculus
 - **Computer Science and Engineering:** Machine Learning*, Computer Vision*, Cryptography*, Cyber Physical Systems*, Computer Networks, Operating Systems, Data Structures and Algorithms, Software Engineering, Parallel Computing, Database and Information System, Automata Theory & Logic, Compiler Techniques
 - **Online Courses:** Fundamentals of Reinforcement Learning, Neural Networks and Deep Learning, Hyperparameter Tuning, Regularization and Optimization, [other Course Certifications](#).
- *Present Semester courses

POSITIONS OF RESPONSIBILITY

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

ACHIEVEMENTS

- **ThinkSwiss Scholar 2024**, Selected for a fully funded, semester-long research visit at ETH Zurich. 2024
Amongst the 20 scholars selected from over 150 applicants.
- **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, awarded to top 0.67% 2019