RAHUL MASAGONI

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EDUCATION

University at Buffalo **Currently Enrolled**
MS. Robotics Expected Dec 2025
Relevant Coursework: Introduction to Robotics, UR3 robot, Collaborative Robotics, Probability for Robots, Machine learning, Robotic algorithms, Bio Micro-Electro Mechanical Systems (MEMS), Robot Control Systems.

Illinois Institute of Technology (Aug-2023) – (May-2024)
MS. Autonomous Systems and Robotics **(**Transferred to UB)
Relevant Coursework: Optimal Control, CAD/CAM, Engineering Analysis, Data Driven Modelling, System Analysis and Control, Modern Control Systems.

SRM Institute of Science and Technology, Kattankulathur, India **June 2023**
Bachelor of Technology in Mechatronics

SKILLS

Languages: Python, C++, MATLAB
Libraries and Tools: OpenCV, ROS, TensorFlow, PyTorch, Open3D, Git, Arduino, bash, ABB RobotStudio, CARLA, MoveIt, SolidWorks, Simulink, ControlDesk 2.0, GCS, Docker, LabView, AutoCAD, PLC Programming.
Development Platforms: Linux (Ubuntu), Embedded robotics, Gazebo

EXPERIENCE

SRM Institute of Science and Technology – India **Jan 2022 - May 2023**
- Designed and optimized a PID controller for precise DC motor speed control, reducing response time by **14%**. Executed real-time HIL simulations with dSPACE 1104 and MATLAB/Simulink, improving closed-loop performance
- Implemented Simulink models with RTI libraries to interface BLDC motors and H-bridge drivers, validating performance through oscilloscope analysis.

Smart IoT Based Integrated Farming - India **DEC 2022 – MAY 2023**
- **Smart IoT-Based Irrigation:** Utilizing the temperature, pH, humidity, and soil moisture sensors to monitor the soil conditions and automatically control irrigation by turning the motor ON/OFF, reducing water wastage. This sensor data and other information are displayed on the android app Adafruit Iot Dashboard.
- **Rodent detection :** The device also detects the presence of rodents in the field with the usage of camera using image processing technology and notifies the user to spray the detected area with an anti-rodent solution.

ACADEMIC PROJECTS

TurtleBot navigation and stereo visual odometry using robotics algorithms in ROS **FEB-2025**
- Controlled the TurtleBot3 (Burger model) in the Gazebo simulation environment using a custom ROS publisher node to understand the publisher-subscriber communication.
- Implemented a wall following behavior for the turtlebot3 and the goal-seek behavior into a Bug 2 navigation algorithm.
- Implemented the stereo visual odometry algorithm to estimate the motion of a robot using stereo images.

SLAM-Based Cost Map Generation using LiDAR **MAR-2025**
- Built a LiDAR-based SLAM pipeline to generate dense point cloud maps of an environment. Transformed point clouds into 2D cost maps to support obstacle avoidance and autonomous navigation.

RRT-Based Path Planning in ROS **APRIL-2025**
Developed a motion planning system using Rapidly-Exploring Random Trees in ROS. Created custom nodes for random sampling, collision detection, and trajectory generation. Tested planner performance in both static and dynamic environments

Stereo Visual Odometry using OpenCV **MAY-2025**
Implemented a stereo visual odometry algorithm to estimate robot motion using stereo camera feeds. Used OpenCV for feature extraction, tracking, and pose estimation. Visualized robot trajectory in 3D and evaluated performance on datasets

Energy-Efficient Optimal Path Planning for Autonomous Robot Navigation **JAN2024 – MAY2024**
- Developed an optimal path planning system using the Hybrid A* algorithm for energy-efficient and time-minimized autonomous navigation from start to stop position in an environment.
- Designed a cost function to optimize trajectory for smooth, collision-free motion within kinematic constraints.

CERTIFICATIONS & EXTRA-CURRICULAR ACTIVITIES

Courses & Workshops: Robonetics 2.0, Sensory perception of autonomous driving, Fanuc CRX workshop, DMG MORI CNC workshop, Design 2-part workshop, Automate Show and workshop. crash course on python (google).

Event Coordinator for Milan: Operations Resources Management Committee Head, S.R.M University and also Discipline Committee Member, India, S.R.M University, MHRD Volunteer.