JAY B MENON

Tempe, AZ | (602) 471 3395 | menonjay85@gmail.com | linkedin.com/in/jay-menon99/ | github.com/menonjay85 | Portfolio | Google Scholar

PROFESSIONAL SUMMARY

Robotics Software Engineer experienced in Python (Flask), embedded systems, and robotics automation using ROS, Docker, and Raspberry Pi. Proven delivery of end-to-end lab robotics solutions from control logic to hardware integration for wet lab automation.

TECHNICAL SKILLS

Hardware Integration: Embedded Systems, Raspberry Pi, Linux, Jetson Nano, SPI/I2C, CAN, Docker, CMake, Git, CI/CD
Programming: Python (Flask), C++, Bash, SQL, Object Oriented Programming, JSON
Perception & Control: SLAM, LiDAR, Sim2Real, Sensor Fusion, Reinforcement Learning, TensorFlow, OpenCV, Kalman Filters, PID, MPC, Logging, Networking
Simulation & Modeling: ROS, Isaac Sim, MATLAB, Simulink, SolidWorks, AutoCAD, Fusion 360

WORK EXPERIENCE

Research Fellow **August 2024 - May 2025**
Taiwan Semiconductor Manufacturing Company **Phoenix, AZ**

- Architected **digital twin** pipeline in Isaac Sim, integrating **LIDAR** to validate worm robot navigation, achieving 98% Sim2Real fidelity.
- Developed control algorithms (PID, Fractional PID, Sliding Mode, Koopman PID, MPC) with Python for robot **trajectory tracking**, minimizing tracking error by **47%**.
- Interfaced multimodal sensors (**LIDAR**, camera, encoders, range sensors) via **ROS** for robot policy validation.

Robotics Maintenance Engineer **July 2021 - July 2022**
Mahindra & Mahindra Automotive Ltd **Mumbai, India**

- Spearheaded rapid **root cause analysis** of embedded systems, actuator drives and **sensor fusion** logs (proximity, encoders), slashing downtime by atleast 6 hrs daily.
- Integrated fault-handling routines using **HIL** methods in live production lines.
- Tuned servo-drive control loops via **MATLAB** & **Simulink** and motion profiles to optimize throughput.
- Programmed, tested, and commissioned **Siemens** & **Allen-Bradley PLCs** reducing line downtime by 18%.
- Developed anomaly detection & machine learning scripts using **Python** & **C++** for gear testing rig automation.
- Presented progress, resolved issues, and drove conflict resolution during weekly status reviews.

Robotics Intern **August 2024 - May 2025**
EntreVita Inc **Grand Rapids, MI**

- Led meal preparation with robotic arm using **ROS** & **Python** while reducing time by 20s through **trajectory optimization**.
- Developed **Fast R-CNN** model in **PyTorch** with **OpenCV** on **Jetson Nano**, delivering **94%** real-time food classification.

Robotics Intern **June 2024 - August 2024**
99 Yards **New York, NY**

- Trained and validated **MobileNetV2** fabric classifier on real textile samples, achieving **85%** accuracy under varied lighting.
- Integrated **ARM based camera** for integrated **vision system** and live database queries for end-user retail assistance.
- Delivered live demos to stakeholders and securing pilot-program approval.

Robotics Intern **May 2019 - July 2019**
Automation and Control Systems **Pune, India**

- Queried process telemetry from **Microsoft SQL** database to build trend analyses in Power BI.

Robotics Developer **November 2022 - July 2023**
Unilever PLC **Mumbai, India**

- Integrated robotic process lines and streamed IMU, encoder, proximity & **vision** data to an IoT Hub, enabling real-time analytics using **Power BI**.

PROJECT EXPERIENCE

LIOSAM (01/2024 – 05/2024) - Deployed a real-time point cloud processing **LIDAR - IMU SLAM** vision system in **ROS**, attaining 10 times faster precise localization via GTSAM factor graph optimization.

UR5 Palletizer (08/2024 – 12/2024) - Programmed a palletizing program with **Universal Robots** for dynamic obstacle aware waypoint planning by defining spatial layouts (rows, columns, layers).

Extended Kalman Filter SLAM (08/2024 – 12/2024) - Implemented **EKF SLAM** using odometry and bearing-range data on Turtlebot 3, integrated landmark association, and visualized robot pose and map belief.

EDUCATION

Master of Science in Robotics and Autonomous Systems **May 2025**
Arizona State University **(GPA: 4.0)** **Tempe, AZ**