

# SHIVARAM KUMAR JAGANNATHAN

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## EDUCATION

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### Manipal Institute of Technology

*Bachelor of Technology in Information Technology, CGPA: 8.5/10*

– Relevant Coursework: Modern Robotics, Embedded Systems, Computer Vision, Control Systems, Machine Learning

Bangalore, India

*Expected Graduation: 2026*

## SKILLS & RESEARCH INTERESTS

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**Core Domains:** Spatial-Semantic Models, Robot Perception, SLAM & Localization, Task & Motion Planning

**Technical Stack:** C/C++, Python, ROS/ROS2, PyTorch, Bash, Numpy

## EXPERIENCE

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### Nanyang Technological University, Singapore

*Researcher*

- Built an end-to-end multi-object 3D reconstruction and grasp generation pipeline (SAM3D, FoundationPose, Qwen2.5) with a smooth torque control system for the Franka FR3.
- Co-authoring *Mani-Imagine* (Target: ICRA 2027), an algorithm for occlusion-aware task and motion planning for novel object search using POMDP and 3D Reconstruction.

Jan. 2026 - Present

*Singapore*

### Virya Autonomous Technologies

*Robotics Systems Engineer Intern*

- Developed a global localization system for AMRs achieving 0.05 m Absolute Trajectory Error with a GNSS-based fallback relocalization mechanism for centimeter-level accuracy.
- Engineered a robust SLAM perception pipeline fusing Ouster OS-1 128-channel LiDAR, Intel RealSense, and Optical Flow odometry; conducted multi-session SLAM experiments covering 3 km<sup>2</sup> of trajectories.
- Designed a high-performance OpenGL point-cloud rendering subsystem (loading 30M points in < 5s) and an internal environment-authoring toolkit for map visualization and global waypoint generation.

Jun. 2025 - Dec. 2025

*Bangalore, India*

### Centre of Excellence in Autonomous Mobility, MIT

*Technical Lead*

- Wrote an Unscented Kalman Filter to fuse IMU with GNSS readings accounting for RTK corrections.
- Upgraded LIO-SAM to utilize multi-channel semantic scan context for improved loop closure.

Jan. 2025 - Present

*Bangalore, India*

### Exponent Energy

*Software Engineer Intern*

- Deployed an AWS Kubernetes cluster for a charging station locator mapping 100+ stations.
- Wrote CAN-based communication reliability and fault detection firmware for electrical power systems.

Jun. 2023 - Aug. 2023

*Bangalore, India*

## TECHNICAL PROJECTS

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### AToM: Adaptive Teleoperation Middleware for Humanoid Manipulation

*Lead Developer*

- Developed a ROS2 teleoperation framework mapping Meta Quest VR headset and 6-DoF controllers to a humanoid robot in real-time, achieving  $\approx 20$  ms end-to-end latency.
- Integrated KDL-based inverse kinematics for bilateral arm and neck chains, achieving a 99% solve success rate with adaptive reach projection and relative motion scaling.

Oct. 2025

### Vision-Based Quadcopter for Crop Health Monitoring

*Lead Developer*

- Achieved autonomous flight with  $\pm 0.1$ m accuracy using a custom LQR controller and vision-based pose estimation, completely eliminating reliance on IMU or odometry sensors.
- Implemented a crop-health identification system via onboard camera running YOLO.

Aug. 2025 - Nov. 2025

## PUBLICATIONS & AWARDS

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**Thesis:** *VLM enabled Semantic Soft-Collision Manipulation* (B.Tech Thesis)

**Lead Researcher:** IIT Bombay eYantra Robotics Competition (Top 1% — advanced autonomous SLAM navigation).

**Scholarship:** AWS DeepRacer Scholarship (Recognized for excellence in reinforcement learning).