Kishore Paranthaman

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Education

Johns Hopkins University **(Dean's Master's Fellowship for Academic Excellence)** Baltimore, MD, USA
Master of Science in Engineering Degree, Robotics (Advisor: Dr. Russell H. Taylor) *August 2024 – May 2026*

Vellore Institute of Technology **(CGPA: 8.74/10)** Chennai, India
Bachelor of Technology in Electronics and Communication Engineering *September 2020 – July 2024*

Experience

Graduate Research Assistant Oct 2024 – Present
Intelligent Medical Robotic Systems and Equipment Lab, JHU *Baltimore, Maryland*

- Currently developing an image-guided dual-arm robotic system (ASTR) for autonomous tumor resection, aiming to achieve 100% precision with no positive margins in porcine tongue sample experiments. The system is being tested in a glossectomy-mimicking surgical setup to surpass manual resection performance by experienced surgeons by 20%.

Research Intern - Singapore International Pre-Graduate Award (SIPGA) Feb 2024 – Jul 2024
*ROS-Industrial Consortium Asia Pacific, ARTC, A*STAR* *Singapore*

- Conducted high-fidelity analysis of 3D point cloud data using LEGO-LOAM on mobile robots, revealing a 23% drop in detection accuracy in dynamic rain and 18% in static rain; evaluated Velodyne, Ouster, and SICK, identifying 9.5% noise in rain vs. 2.6% in dry conditions to develop an open-source ROS2 package set for release in 2025.

Robotics Software Intern May 2023 – Oct 2023
Mowito *Bangalore, India*

- Led the development of a ROS2 controller for the Kinova Gen3 arm prior to official support, optimizing time-parameterized trajectory planning for faster performance and achieving a 20% improvement in operational efficiency, completing over 1,000 tasks. Contributed to software development by implementing Flask API interfaces and PostgreSQL for logging, as well as troubleshooting system issues, which resulted in cost reduction, streamlined operations, and an enhanced user interface for an improved user experience.

DST-INSPIRE Project Intern Aug 2022 – Apr 2023
Robert Bosch Center for Cyber-Physical Systems, Indian Institute of Science *Bangalore, India*

- Developed and optimized forward kinematics and Jacobian-based trajectory generation for precise robotic arm manipulation, achieving translation errors under 2 mm and rotation errors under 0.5°. Contributed to the development of an autonomous chemistry lab assistive robot by utilizing ROS MoveIt and a Kuka LBR iiwa R820. Additionally, refined layout designs, evaluated motion planning algorithms, and incorporated STag markers for accurate pose estimation, ensuring robustness against 30% occlusion.

Robotics Intern Dec. 2021 – Jul. 2022
HCL Technologies Ltd *Chennai, India*

- Developed a technique for creating synthetic datasets using Unreal Engine and NVIDIA Scene Imaging Interface to train 6D pose estimation models for textureless objects, reducing data generation time. Proposed and validated the approach with NVIDIA's Deep Object Pose Estimation model, achieving 74% accuracy—on par with real datasets.
- Executed instance segmentation with Mask R-CNN and object detection with YOLOv5 to improve bin-picking accuracy using UFactory's xArm5 cobot via ROS, enhancing automation efficiency and reducing task errors by 13%.

Projects

Optimal Grasp Estimation for UR5 Using Reinforcement Learning Nov 2024

- Leveraged PPO to enhance the grasping efficiency of a robotic arm by acquiring object poses through NVIDIA's Foundation Pose. Currently applying transfer learning to simulate the robot's grasp attempts at various points, aiming to identify the optimal grasp pose for real-world execution to improve grasp reliability and precision.

Apple Fruit Disease Detection using Cycle-GAN Nov 2022

- Utilized CycleGAN to generate 1000 realistic diseased apple images from 950 healthy samples, overcoming dataset limitations.
- Trained a YOLOv5-ShuffleNet model on the generated dataset, achieving 87% accuracy.

Skills

- **Languages**: C, C++, Python, Core Java, Embedded C, MATLAB, R.
- **Software Tools**: ROS, ROS2, Numpy, OpenCV, Keras, Pytorch, Tensorflow, Gazebo, OpenGL, Docker, Git, Latex.