SUMANTH PASHUPARTHI

5087138417 ⋄ 125 Highland Street,Worcester, MA
sumanth.sssk@gmail.com ⋄ linkedin.com/in/Sumanth-Pashuparthi

EDUCATION

Worcester Polytechnic Institute (CGPA: 3.66/4.0) Worcester, MA
Master of Science - Robotics Engineering Jan 2023 - Present
Relevant Coursework: Motion Planning, Vision Based Manipulation, Computer Vision, Robot Control, Machine Learning

Jawaharlal Technological University (CGPA: 8.4/10.0) Hyderabad, India
Bachelor of Technology - Mechanical Engineering Aug 2017 - May 2021
Relevant Coursework: Robotics, Control Systems, 3D Printing, Instrumentation and Control Systems

TECHNICAL SKILLS

Programming	C/C++, Python, MATLAB
Frameworks	ROS1/2, PyTorch, TensorFlow, OpenCV, NumPy, OMPL, Git, PyBullet, MuJoCo
CAD & Tools	SOLIDWORKS, CATIA, AutoCAD, FUSION 360, ANSYS, Linux, RViz, Gazebo

PROFESSIONAL EXPERIENCE

Worcester Polytechnic Institute Worcester, MA

- **Graduate Student Researcher**, ELPIS Lab Apr 2024 - Present
  - Implementing learning-based algorithm for UR10 manipulator precise tossing tasks using 3D reconstruction
  - Developing deep learning models for trajectory optimization and task success prediction
- **Prototyping Lab Assistant**, Maker's Space Oct 2024 - Present
  - Provide technical guidance in CAD modeling, design optimization, and rapid prototyping
  - Train students on professional equipment including 3D printers and laser cutters

CTRLS DATACENTERS PRIVATE LIMITED Mumbai, India
Robotics & Automation Engineer Aug 2021 - Dec 2023

- Developed autonomous mobile robot (AMR) with vision system for server rack inspection, reducing downtime by 20%
- Architected multi-robot system using ROS2 for datacenter monitoring with SLAM and custom path planning
- Designed computer vision pipelines using OpenCV/PyTorch for thermal imaging analysis and anomaly detection
- Created digital twin simulations in Gazebo for testing robot behaviors and control algorithms
- Developed inverse kinematics solutions and motion planning algorithms for robotic arm integration
- Led development of ROS-based GUI for robot fleet management using RViz and Qt
- Implemented ML models for predictive maintenance using sensor data from robotic systems
- Optimized robot perception by integrating multiple sensors (LiDAR, RGB-D, thermal cameras)

INDIAN RAILWAYS Hyderabad, India
Robotics Intern Jul 2019 - Aug 2019

- Developed computer vision algorithms achieving 85% accuracy in wheel defect detection
- Programmed 6-DOF robotic manipulator for autonomous inspection with RGB-D camera integration

- Created ML pipeline using TensorFlow to classify wheel wear patterns, reducing inspection time by 40%
- Implemented real-time monitoring interface for inspection data visualization

TECHNICAL PROJECTS

- **Tactile-Vision Integrated Manipulation**
  - Developed multi-modal system integrating tactile sensors and vision for robust manipulation
  - Implemented force feedback control strategies and sensor fusion for real-time object state estimation
  - Created adaptive control system for safe handling of fragile objects while maintaining efficiency
- **Advanced Robotic Manipulation**
  - Developed vision-based 3D object reconstruction pipeline for robust grasp detection (90% success)
  - Implemented grasp quality assessment metrics and hybrid position/visual servoing control
  - Integrated depth sensing for improved grasp point selection and obstacle avoidance
- **Motion Planning Research**
  - Implemented and benchmarked Reachability-guided RRT (RGSST) planner against SST and KPIECE
  - Developed "Sokoban on Ice" task planner handling dynamic constraints and sequential planning
  - Optimized algorithms for improved computational efficiency in high-dimensional spaces
- **Custom Gripper System**
  - Designed specialized gripper with integrated sensors and modular end-effector design
  - Implemented grasp detection pipeline using active vision for optimal grasp points
  - Developed real-time grasp quality assessment algorithms for adaptive grasping
- **ROS2 Camera Calibration**
  - Developed hand-eye calibration system using AprilTag markers for visual servoing
  - Created automated calibration routine for camera extrinsics calculation
- **Tree-Based Motion Planner**
  - Implemented and benchmarked custom planning algorithm against RRT variants
  - Integrated obstacle avoidance and path smoothing for practical deployment
- **UAV Quadrotor Control**
  - Developed LQR-based controller with EKF state estimation for trajectory following
  - Created simulation environment for testing various flight scenarios
- **ROS Manipulation**
  - Implemented kinematics and motion planning for OpenManipulator-X arm control
  - Developed custom interfaces for various manipulation tasks