SHIVA SAM KUMAR GOVINDAN

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SUMMARY

Robotics Engineer with 3+ years in autonomous systems, industrial automation, and UAVs. Skilled in ROS2, Python, C++, MATLAB, sensor fusion, motion planning, and AI-driven perception. Deployed scalable robotics for warehouse automation, aerial surveillance, and disaster response. Experienced in multi-robot coordination, digital twins, and IoT integration using MoveIt, Gazebo, Carla simulator and AWS RoboMaker to deliver efficient, reliable systems.

EXPERIENCE

EPICS Pro, Arizona State University, Tempe, AZ **Jul 2024 - Present**

Robotics Engineer (It Core foundation)

- Programmed ABB IRB 2600 robotic arms using ROS-I and MoveIt to automate palletizing tasks for a Manufacturing Client, reducing cycle time by 25% through Ether CAT integration with Beckhoff PLCs.
- Integrated Fanuc robots into a new production line using Roboguide and developed a Vision-based edge-detection system to calculate pallet orientation in real time, dynamically adjusting the end effector for precise, reliable pallet handling.
- Optimized CHOMP and STOMP in MoveIt for 7-DOF manipulators, reducing motion jerk by 30%, boosting grasp success by 30%, and cutting execution time by 25% for autonomous voice-controlled pick-and-place via a Flask-based interface.
- Built a Kalman filter in ROS2 to fuse LiDAR (Velodyne VLP-16) and RealSense D455 data for 97% detection accuracy and created a digital twin in NVIDIA Isaac Sim for AGV path planning, reducing real-world testing costs by 40%.
- Deployed a YOLO V12 -based vision Detector on an autonomous agricultural rover achieving 98% crop disease detection accuracy at 25 FPS and cutting field survey time by 60% and launched a RAG-powered chat app built with Lang Chain on a web server with 99.9% uptime supporting daily active users.
- Implemented Visual Language Architecture, large language models and convolutional neural networks (CNNs) for natural language-based decision-making, streamlining tasks and reducing execution time by 25% while improving precision.

Launch Trax Private Limited, Bangalore, India **Feb 2020 - Jul 2022**

Robotics Application Engineer

- Processed LIDAR DEMs with GRASS GIS/GDAL, automating flood-risk mapping via Python/Scikit-learn, and streamlined QGIS workflows with SQL/GeoServer, rendering aeronautical charts at 10,000:1 scale for aviation clients.
- Deployed Open VINO-optimized YOLOv5 on Intel NUC for real-time aerial object detection, achieving 45 FPS on Hikvision thermal cameras for surveillance missions.
- Deployed TensorRT-optimized YOLOv8 on NVIDIA Jetson Orin for real-time defect detection with ROS2-based QC and cut Hector SLAM drift by 20% in GPS-denied environments via GTSAM factor graphs on Husky UGV platforms.
- Developed STM32-based motor controllers with FreeRTOS/TMC2209 for 0.1° UAV gimbal stabilization in aerial photogrammetry and implemented MPC in MATLAB/Simulink for trajectory tracking, cutting tracking error by 18%.
- Developed and optimized geo-pointing & geo-location algorithms in Python, leveraging OpenCV, GDAL to convert UAV camera feeds from image coordinates to world coordinates via a GUI interface, improving navigational accuracy by 40%.
- Processed LiDAR with PCL/Cloud Compare, deploying LOAM on Xavier NX for real-time 3D terrain reconstruction; built an autonomous UAV with ORB-SLAM and sensor fusion in ROS2, using Python/OpenCV for live image processing.

SKILLS

- **Robot Frameworks & Languages:** Python, C++, MATLAB, ROS2, MoveIt, Nav2, OMPL, GTSAM, FreeRTOS
- **Perception & AI:** OpenCV, TensorFlow, PyTorch, Kalibr, Scikit-learn, PCL (Point Cloud Library), RTAB-Map.
- **Simulation & Modelling:** Gazebo, CARLA, Webots, Issac Sim, Blender, AWS RoboMaker
- **Mechanical Design & Analysis:** CATIA V5, SolidWorks, Simens NX, Hyper Mesh, Ansys
- **Embedded Systems & IoT:** STM32, Raspberry Pi, NVIDIA Jetson, TMC2209, Socket CAN, Ether CAT
- **Certifications:** Self-Driving Cars Specialization – Toronto University**,** Introduction to Robotics in Microelectronics – ASU, Diploma in Mechanical CAD – CAD School**,** MATLAB Certification – Skill-Lync

EDUCATION

M.S, Robotics and Autonomous Systems (Mechanical and Aerospace Engineering) **Aug 2022 - May 2024**

Arizona State University, Tempe, Arizona

B. Tech, Aeronautical Engineering **Aug 2016 – May 2020**

Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, India