

SHIVA SAM KUMAR GOVINDAN

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SUMMARY

Robotics Engineer with 2+ years of experience designing and programming automated systems, specializing in robotics integration, control systems, and process optimization. Proficient in C++, Python, and ROS2 with hands-on expertise in visual perception and Navigation. Adept at developing solutions for manufacturing and automation challenges in collaborative, fast-paced environments.

WORK EXPERIENCE

EPICS Pro Volunteer, Arizona State University (ASU), Tempe, AZ

Jul 2024 – Present

Client: IT Core Foundation, Suriname | Mechanical Engineer

- Designed and implemented control systems for autonomous drones, optimizing system performance and durability.
- Developed simulation models in MATLAB to validate control algorithms, ensuring seamless integration with hardware.
- Designed the fuselage hub for the drone, focusing on optimizing structural efficiency, ensuring durability and performance.

Client: Rainier Labs, San Francisco, CA, USA | Robotics Engineer

- Collaborating on the development of a centaur robot, focusing on the mobile base and navigation stack programming.
- Implementing Visual Language Architecture (VLA) models to advance the robot's perception framework.
- Integrating off-the-shelf visual language models, including Gaussian Splats, SAM, and CLIP, to enhance autonomous capabilities

Launch Trax Private Limited, Bangalore, India | Application Engineer & QA analyst

Jan 2021 – July 2022

Clients: Defense Research and Development Organization (DRDO), Hindustan Aerospace Limited (HAL)

- Developed and optimized geo-pointing & geo-location algorithms, using effective coordinate transformations and Euler angles improving navigational accuracy by 40% also enhanced system reliability through effective sensor alignment techniques.
- Authored and meticulously executed comprehensive test plans, conducting extensive unit testing on core GIS and Navigation algorithms for GUI applications, enhancing accuracy and ensuring performance across varied operational scenarios.
- Streamlined a GIS framework to de-clutter Aeronautical map elements by 50%, enabling dynamic manipulation and attribute clarity at various zoom levels with Geoserver, HTML, C++, and QGIS, enhancing user interpretability by 30%.
- Crafted System Requirements (SRS), Acceptance Test Procedures (ATP), and user manuals with LaTeX and Sphinx, leveraging strong communication skills to coordinate with 4 departments and a 5-official panel, emphasizing team collaboration.

ACADEMIC PROJECTS

3-D Multi Object Detection using Point Pillars & TaNet

May 2024

- Enhanced a 3D Multi-Object Tracking system by integrating Point Pillars and TAnet, accelerating processing speed to 407.2 fps and a 61.08% 'Mostly Tracked' object rate in dense environments, demonstrating significant advancements in real-time tracking.

Collaborative Multi-Robot Path Planning and Navigation with DARP and A* Algorithm

Dec 2023

- Engineered a DARP and A* client-server system managing real-time robot coordination through a centralized server system enhancing warehouse efficiency by 30% also displayed the operations and logistics with a real-world simulation in Webots.

Optimal Model Predictive Control (MPC) for 2-D Autonomous Vehicle & UAV Trajectory Tracking

Dec 2023

- Optimized cost functions and integrated MPC control algorithm, achieving less than 5% trajectory prediction error. Demonstrated the system's real-time trajectory adjustments and effectiveness through 3-D animations in Python using a bicycle & UAV model.

Voice-Controlled 3-DOF Robotic Arm: Advanced Simulation and Autonomous Task Integration

May 2023

- Engineered a robotic arm with advanced voice control via Alexa, optimizing kinematics and dynamics using state-space and LQR control for enhanced stability and accuracy. Integrated ROS2, Move It for real-time state prediction and trajectory planning.

Advanced Autonomous Driving System: Real-Time Traffic Compliance and Sign Recognition

May 2023

- Developed a ROS2-based autonomous navigation system using OpenCV and deep learning CNNs, achieving 98% accuracy in traffic light and sign recognition, optimizing detection algorithms and demonstrated performance through Gazebo simulations.

SKILLS

Languages and Technical Toolset: Python, C/C++, Ubuntu, Docker, Kuka, HMI, PLC, Electrical systems, Git, Linux

Libraries and Framework: TensorFlow 2.0, NumPy, Pandas, SciPy, OpenCV, PyTorch, PySide6, ROS (1 & 2), Nav2, Move It

Modelling and Simulation Software's: SolidWorks, Blender, Ansys, Gazebo, Webots

EDUCATION

M.S, Robotics and Autonomous Systems (Mechanical and Aerospace Engineering)

May 2024

Arizona State University, Tempe, AZ

3.63 GPA

B. Tech, Aeronautical Engineering

May 2020

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