

# SHIVA SAM KUMAR GOVINDAN

+1 6029218754 | shivasamkumarg@gmail.com | LinkedIn | Website | GitHub

## SUMMARY

Robotics Engineer with 2+ years of experience designing and programming automated systems, specializing in robotics integration and control algorithms. Proficient in C++, Python, OpenCV and ROS2 with hands-on expertise in visual perception and Navigation. Adept at collaborating across multidisciplinary teams to develop and deliver reliable solutions for autonomy and robotics applications.

## 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 TANNet, 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