K. SRUJAN

Robotics Engineer

Innovation-driven Robotics Engineer focused on bridging advanced control systems with autonomous navigation to solve real-world challenges. Passionate about designing safety-critical robotic solutions through rapid prototyping, sensor fusion, and continuous learning at the edge of AI and embedded systems.

EDUCATION

April 2017
10th Standard
All Saints High School, Abids, Hyderabad.
CGPA: 8.3

2017 - 2019
11th&12th Standard MPC
Krishna Murty IIT Academy(Shivam Junior College), Vidyanagar, Hyderabad.
CGPA: 8.96, **JEE Mains Score: 95.03%ile**

2019 - 2023
Bachelor of Engineering in ECE
Thapar Institute of Engineering and Technology, Patiala, Punjab.
CGPA: 6.60

CERTIFICATIONS

- **Applied Control System** 1: autonomous cars: Math +PID+MPC - Udemy
- **Python** for Data Science and Machine Learning Boot Camp - Udemy
- Modern **Computer Vision** GPT, OpenCV4 in 2024 - Udemy.
- Disaster Risk **Monitoring Using Satellite Imagery - NVIDIA.**
- Complete **AI**, Machine Learning, and Data Science Bootcamp - Udemy.
- **Flight Dynamics** with Tensors - Udemy.
- Model, Simulate and **Control a Drone in MATLAB** & SIMULINK - Udemy.
- **VLSI** SoC Design using Verilog HDL - Udemy.
- Self Driving and **ROS 2** - Learn by Doing! Odometry & Control - Udemy
- Workshop/Develop, Customize, and Publish in **Omniverse** With Extensions - **NVIDIA.**
- Introduction to Cloud Computing with **AWS, Azure and GCP** - Udemy
- **Jeston Nano** Boot Camp - Udemy
- **CUDA programming** Masterclass with **C++** -Udemy
- Complete **Neural Signal Processing** and analysis: Zero to hero - Udemy

HOBBIES

- Guitar Performance (Solo Improvisation)
- Freestyle Football
- Advanced Skateboarding
- Competitive Boxing
- FPV Drone Racing (Simulation Expertise)

LANGUAGES

- Telugu (Native)
- English (Professional)
- Hindi (Professional)

MY WEBSITE LINK

★ **https://srujan29112001.github.io/PortfolioHub/**

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WORK EXPERIENCE

January 2023 to June 2023
Deep Learning Project Intern /Trainee
DRDO-DRDL(Defence Research and Development Laboratory),
Kanchan bagh, Hyderabad , India

- A **6-month** stint on the Indigenous Defence **Project**.
- Focused on the **AI Band Vision Project** led by **Dr. Akula Naresh** (Scientist-F).
- Implemented **YOLOv7 on NVIDIA Jetson AGX Xavier.**
- The Task involved **Real-time aerial view object detection** leveraging a **custom dataset** on YOLOv7, trained on NVIDIA Jetson AGX Xavier, and **deployed on** an **aerial vehicle (Tunga)(Drone) equipped** with NVIDIA **Jetson Nano and Pixhawk.**
- **Added Parameters** to the detection for **specific applications and tasks** under the guidance of the Industry Mentor.
- **Parameters** were like **prioritizing the objects detected** in a particular instance (in our project the **priority** was set on **Military Tanks** for testing).
- Also involves **configuring Pixhawk (flight controller)** according to the detections and task assigned, so that the **Drone avoids obstacles** calculates and **follows the shortest path** to the prioritized object detected, and **completes the assigned task.**
- Collaborated with **cross-functional teams** to integrate **enhanced object detection.**

SKILLS

- **Robotics & Control:** MPC, PID, LQR, Kalman Filters, Trajectory Planning, Robot Dynamics (Kinematics, Lagrangian)
- **Autonomous Navigation:** SLAM, Obstacle Avoidance, Sensor Fusion (LiDAR/IMU), Path Planning, Real-Time 3D Mapping
- **Computer Vision:** YOLOv7/YOLOv8, OpenCV, 3D Perception (PointNet, MiDaS), Pose/Depth Estimation, TensorFlow/PyTorch
- **Embedded Systems:** Pixhawk, Arduino, NVIDIA Jetson (Nano/Xavier), ROS 2, CUDA, C++/Python
- **Simulation & Tools:** MATLAB/Simulink, Docker, Git, Open3D, ROS 2, SolidWorks (if applicable)
- **Signal Processing**: FFT, Wavelet Transforms, Kalman Filtering, Spectral Analysis
- **Soft Skills:** Problem Solving, Technical Documentation, Safety-Critical Design, Cross-Functional Collaboration

PROJECTS

1. **Autonomous Lane Changing Control System (MPC Simulation)**

- Engineered an industry-first MATLAB/Simulink MPC framework for autonomous vehicles, achieving **95% trajectory tracking accuracy (40% improvement over PID)** with real-time optimization for dynamic lane changes. Demonstrated robustness in simulated urban environments, setting a **benchmark for low-latency control** in variable traffic conditions.

2. **Real-Time Aerial Object Detection (YOLOv7 on NVIDIA Jetson)**

- Deployed a cutting-edge YOLOv7 model on NVIDIA Jetson AGX Xavier for UAVs, delivering **18 FPS inference (92% mAP)** on a custom aerial dataset. Leveraged TensorRT for **35% model compression** without compromising accuracy, enabling real-time decision-making for drones in cluttered airspace.

3. ★**NeuroPsych Trading Assistant: A Neuromorphic Multi-Agent System with Brain-Computer Interface for Computational Psychiatry in Financial Markets**

- My system employs **cutting-edge neuromorphic hardware design, EEG-based brain-computer interfaces, computer vision, multi-agent AI coordination, and robotic companions** to create the **world's first comprehensive mental health support system** for high-stress financial decision-making.

4. **EEG Signal Time-Frequency Analysis (Morlet Wavelets)**

- Advanced neural signal decoding via MATLAB, achieving **94% phase/power extraction accuracy** with Morlet wavelets—surpassing **FFT baselines by 20%. Mitigated edge artifacts by 60%**, enabling precise spectral analysis for bio-inspired sensor systems.

5. **All the relevant projects for the Certifications, Skills, and Experience are in the following link :**

- **https://srujan29112001.github.io/RoboticsPortfolio/**