Arihant M A

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Professional Summary

Computer Vision & Edge AI engineer specializing in **real-time object detection** and **embedded deployment**. Built end-to-end vision pipelines using **YOLO, OpenCV, PyTorch**; achieved **89% mAP** on custom datasets. Deployed optimized models on **Raspberry Pi** and **FPGA (ZCU104)**. Strong in **robotics perception, ROS2**, and real-time video analytics for industrial and autonomous systems.

Education

B.E. Electronics and Communication Engineering — KLE Technological University, 2022–26
PUC Collage — RB Patil Mahesh PUC Collage, 2020–22

Experience

Computer Vision Intern – DocketRun — 2026

- Developed **real-time CV pipelines** for industrial automation; built **YOLO-based ANPR, harness detection**, and visual monitoring systems.
- Designed end-to-end pipeline: **video capture** → **preprocessing** → **inference** → **post-processing** for live streams.

Avionics Engineer – AeroKLE Aero-Design Team — 2024–25

- Developed **autonomous drone systems** using **ROS2, Gazebo, MAVLink** for surveillance and disaster response.
- Implemented **vision-assisted navigation** and waypoint planning; achieved **AIR 3 (AeroTHON 2024)** and **AIR 2 (ADDC 2024)**.

Technical Projects

360° Vision-Based Autonomous Navigation on QCar | *Python, OpenCV, ROS2, LiDAR*

- Built **360° surround-view perception** using 4 CSI cameras with real-time panorama stitching (alpha-blending).
- Integrated **LiDAR obstacle detection** with lane detection (HSV filtering) and **FSM** for autonomous navigation on Quanser QCar.

Edge AI Object Detection on Raspberry Pi 4 | *Python, OpenCV, Deep Learning*

- Trained **YOLO achieving 89% mAP** on 5,000-image dataset; optimized inference for low-latency edge deployment.
- Integrated camera stream processing with on-device AI inference for real-time detection workflows.

Hardware Accelerated Object Detection on FPGA (ZCU104) | *Vitis AI, YOLO, FPGA*

- Deployed YOLO on **Xilinx ZCU104 MPSoC** using Vitis AI; performed **INT8 quantization** and hardware optimization.
- Achieved significant speedup over CPU baseline on FPGA Programmable Logic.

Autonomous Drone Perception and Navigation (AeroKLE) | *ROS2, MAVLink, Gazebo*

- Built autonomous drone pipeline with **ROS2 nodes** for perception, control, and communication in Gazebo simulations.
- Integrated computer vision with flight control for waypoint navigation and object-based decision making.

Technical Skills

Languages: Python, C
CV & ML: OpenCV, YOLO, OCR, VLM, PyTorch, CNNs, Transfer Learning, Quantization,Agentic AI
Edge AI: ONNX, TensorRT (Basics), Real-Time Inference, Raspberry Pi, Jetson, Xilinx ZCU104 FPGA
Robotics: ROS2, Gazebo, MAVLink, Sensor Fusion, UAV Navigation, Path Planning, Mission Planning
Tools: Git, Linux, Docker

Research & Publications

- **Automated Student Activity Recognition using YOLOv11** – IEEE Conference, 2025 [Link]
- **Hardware-Accelerated Object Detection with YOLOv5-Nano on FPGA** – IEEE , 2025 [Link]