

# Sampath Gugulothu

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## Professional Summary

AI/ML and Computer Vision Engineer with hands-on experience in object detection, edge AI deployment, and real-time model optimization for embedded systems. Skilled in building computer vision pipelines using Python, OpenCV, ONNX, QAIRT, QNN, and quantization workflows on Qualcomm-powered edge devices. Strong background in model conversion, performance benchmarking, deployment debugging, and end-to-end validation for production-oriented AI applications.

## Education

**Vasavi College of Engineering**, Hyderabad  
B.E. in Computer Science and Engineering (AI & ML)

2022 – 2026

## Experience

**AI Developer Intern — PeopleTech Group**

2026 – Present

- Working with the Computer Vision team on AI solutions for autonomous drone and embedded edge-device applications.
- Contributing to model deployment, runtime optimization, and validation workflows for real-time inference on embedded Linux platforms.
- Supporting model conversion, board bring-up, performance tuning, and deployment debugging for production-oriented AI/ML applications.

## Technical Skills

- Languages:** Python, Java, C++, JavaScript, SQL
- AI/ML & Computer Vision:** Computer Vision, Machine Learning, Deep Learning, OpenCV, YOLOv8, YOLOv11, YOLO-NAS, Object Detection, Model Optimization, Quantization
- Model Deployment & Runtime:** ONNX, QAIRT, QNN, DLC Conversion, Qualcomm HTP/NPU Inference, Edge AI Deployment, Embedded AI Pipelines
- Frameworks & Tools:** Node.js, Express.js, React.js, REST APIs, Git, Docker, AWS, Linux, Streamlit
- Platforms:** Rubik Pi, Raspberry Pi, NVIDIA Jetson, Qualcomm-based Edge Boards
- Core Concepts:** Data Structures and Algorithms, OOP, Model Deployment Workflows, Performance Optimization, Real-Time Inference, Embedded Systems

## Projects

### AI-Based Species Detection using Autonomous Drone Systems — AI/ML, Computer Vision, Edge AI

- Built an AI-based species detection pipeline for autonomous drone use cases, covering model conversion, deployment, and real-time validation on **Rubik Pi**.
- Converted a custom YOLO-based detection model from **PyTorch and ONNX to Qualcomm DLC** using **QAIRT 2.44**, representative calibration data, and **W8A16 quantization** for **Qualcomm HTP/NPU** inference.
- Resolved deployment issues related to backend library loading, runtime path mismatches, environment setup, and camera-device validation to stabilize the embedded vision workflow.
- Benchmarked the deployed model with **QNN runtime**, achieving **27–32 FPS live** and about **29.5 sustained inferences/sec** on the NPU.
- Compared CPU and NPU inference on-device and observed approximately **2.7x higher throughput** on the NPU for real-time object detection.

### AI Desktop Assistant — Computer Vision & Automation

- Built a voice-controlled AI desktop assistant to automate routine system tasks using **Python**, **Streamlit**, and API-driven natural language processing.
- Integrated **OpenAI APIs** for natural language understanding and **YOLOv8** for computer vision-based interactions to support multimodal task execution.
- Implemented file handling, application control, and workflow automation features with a focus on low-latency response and usability.

## Certifications & Achievements

- TCS CodeVita Season 13 (Round 1):** All India Rank 1 (2025)
- NPTEL:** Joy of Computing Using Python – 85% (2025)
- Coursera:** Crash Course on Python (2025)
- Coursera:** Foundations of AI and Machine Learning (2025)
- Cisco Networking Academy:** C++ Fundamentals, ITN, Python Essentials (2025)