Aravind Sairam Subburam

• aravindsairam1995@gmail.com • +48 729 646 472 • in/aravind-sairam • github.com/aravindsairam

SUMMARY

Robotics & AI Engineer with 5+ years building real-time autonomy and perception for ground and aerial robots. Experienced across ROS 2, PX4/MAVSDK, SLAM/VIO, simulation (Isaac Sim/Gazebo), and ML-based perception (PyTorch/TensorFlow). **Passionate about continuously learning and experimenting with new tools and methods**, with a track record of rapid prototyping, cross-team integration, and shipping robust systems from simulation to embedded deployment.

SKILLS

Programming Languages : Python, C++

ML/DL Packages : TensorFlow, PyTorch, OpenCV, scikit-Learn, NumPy, Hugging Face, LangChain, LangGraph.

Robotics : Robotic Operating Systems(ROS1, ROS2), PX4 autopilot, MAVSDK, Point Cloud Library(PCL), Nav2, NVIDIA Isaac Sim, NVIDIA Isaac GEMs, Gazebo.

Data/ETL : PostgreSQL, MySQL, MongoDB, Pandas.

DevOps: Git, Docker, GitHub Actions, AWS(EC2, S3, Lambda, SageMaker).

EXPERIENCE

Senior Robotics Software Engineer

LucidBots Inc **April 2024 - Present, Remote**

- Built and configured a custom four-wheel omnidirectional robot in **NVIDIA Isaac Sim** by importing CAD models from **Onshape** and using **ROS 2 Action Graphs**, then deployed a scalable simulation/regression test stack on **AWS EC2** to run automated scenarios, enabling faster iteration, repeatable pre-field validation, and reduced manual verification.
- Integrated and tuned **NVIDIA Isaac ROS GEMs** (e.g., **Visual SLAM**, **Map Localization**) for **visual-inertial odometry** with stereo cameras and **global localization** with **2D LiDAR** which improved localization robustness and runtime suitability for embedded deployment.
- Developed a **natural-language robot control interface** using **LangChain/LangGraph** with **ROS 2** and **OpenAI APIs**, integrating **GroundingDINO + GroundingSAM** for zero-shot detection/segmentation which is more intuitive in human-in-the-loop tasking and perception-driven actions.
- Designed **row/column cleaning maneuvers** for an automated cleaning drone using **C++/ROS 2** with **custom PX4 modes** and build a **coverage-cleaning planner** for pressure-washing ground robots and integrated it with **Nav2**.
- Designed a robust mission **state machine** using **BehaviorTrees.CPP**, adding **lifecycle node management** and **ROS 2 diagnostics** for fault detection and recovery which improved system resilience across multi-mode operations.

Software Developer

Verenia **June 2023 - April 2024, Remote**

- Developed control software for multicopter drones and differential-drive rovers using **Python, ROS, PX4, and MAVSDK**, improving reliability of command/control and autonomous mission execution.
- Partnered with hardware teams to configure, flash, and test **custom PX4 firmware** tuned to aerial and ground vehicle dynamics, reducing integration issues and stabilizing real-world behavior.
- Implemented **GPS-denied indoor navigation** using **Visual-Inertial Odometry (VIO)** and depth sensing to deliver robust localization and mapping in complex indoor environments.
- Built a **Gazebo** simulation environment to validate control and navigation behaviors before field deployment, catching issues earlier and improving field readiness.

Robotic Software Developer

United Robots **July 2020 - May 2023, Warsaw, Poland**

- Built a ROS-based robot diagnostics application in **C++** to monitor system health, telemetry, and performance across platforms, improving observability and speeding up issue triage.
- Implemented real-time **point-cloud filtering/outlier removal** for LiDAR and depth-camera streams using **PCL, ROS, C++, and Python**, improving perception stability by reducing noisy artifacts.
- Developed intrinsic/extrinsic **sensor calibration tooling** for RGB cameras, LiDAR, and ToF sensors using **OpenCV (C++/Python)** with **RANSAC** and **ICP**, improving sensor alignment and downstream fusion accuracy.
- Prototyped perception and localization pipelines, **2D footprint estimation** on ROS costmaps using partial point clouds and **U-Net–style CNNs**, **human instance segmentation** using **YOLOv7** with mask projection into **3D point clouds**, and **6D docking-target pose estimation** using **particle filtering,** enabling rapid evaluation of docking and navigation concepts.

Python Developer

Avantari Medical Technologies Pvt Ltd **February 2018 - September 2018, Hyderabad, India**

- Built a preprocessing pipeline for a **synthetic media detection** system using **OpenCV** and **TensorFlow**, improving data quality and reducing friction in training and inference for fully convolutional models.
- Conducted **EDA** on multimedia datasets using **Python, Pandas, and Matplotlib** to identify patterns and clean data, improving dataset reliability and model iteration efficiency.

EDUCATION

Master of Science in Computer Science

Warsaw University of Technology • Warsaw, Poland • 2021

Bachelor of Engineering in Electronics and Communication

Anna University • Chennai, India • 2017

PROJECT

FPV Drone Build

- Built a custom **5-inch FPV drone** with **ExpressLRS** control link and **Walksnail** digital video system.
- Assembled and tuned multiple FPV builds (ESC/motor selection, PID tuning, RF/video integration), improving flight stability and reliability.
- Earned **EU A1/A3 Remote Pilot Certificate**; experienced in cinematic and freestyle flight.

RAG based chatbot for Salon

Willeder Inc. • September 2023 - November 2023

- Developed a **RAG-based chatbot** using **OpenAI LLMs**, **LangChain**, and **FAISS** to answer customer queries from salon-specific knowledge.
- Collected, cleaned, and curated domain data into structured knowledge chunks for embedding and retrieval, improving response relevance and consistency.
- Implemented conversation memory strategies (session history + summarization/compaction) to support longer multi-turn interactions without context loss.

Summer Intern

BabbleLabs, Inc. (part of Cisco Systems) • July 2019 - September 2019

- Designed and trained a **U-Net–based speech denoising model** using **PyTorch**, including data preprocessing and training pipelines.
- Evaluated multiple architectures using objective speech-quality metrics such as **SSNR** and **PESQ**, and compared performance across datasets/conditions.

CERTIFICATIONS

TensorFlow Developer Specialization

DeepLearning.AI • 2022

Deep Learning Specialization

DeepLearning.AI • 2022