

Adithya Balaji

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PROFILE

Robotics and AI engineer focused on making learned robot policies deployable on real hardware: fine-tuning Vision-Language-Action policies from teleoperation demonstrations, extending them with tactile sensing for contact-rich manipulation, and optimizing them for real-time embedded execution. Hands-on experience integrating and commissioning humanoid robots at customer facilities, where task adaptation effort, robustness, and safety determine whether automation is viable.

RESEARCH INTERESTS

Sample-efficient robot learning (imitation learning, residual RL) · Fast task adaptation of foundation policies · Contact-rich and multimodal (vision, tactile) manipulation · Robust and safe deployment of learned policies in regulated production · Sim-to-real transfer

EDUCATION

M.Sc. in Control and Robotics – Advanced Robotics, Ecole Centrale de Nantes, France *Sept 2020 – Sept 2022*

Master's thesis: *ECG signal processing for epileptic seizure detection* (with Reliev Technologies)

Supervisors: Laurent Ribiere, Prof. Olivier Kermorgant, Prof. Eric Le-Carpentier · [ECN repository](#)

Bachelor of Engineering – Automotive Engineering, Anna University, India

Aug 2012 – Apr 2016

PROFESSIONAL EXPERIENCE

AI Software Engineer, Neura Robotics GmbH

München, Germany · Sept 2024 – Present

- Fine-tuned **Vision-Language-Action (VLA)** policies via **imitation learning** on teleoperation demonstrations: **LoRA adaptation of the VLM backbone** and full training of **diffusion action heads** for continuous manipulation control on single-node multi-GPU infrastructure.
- Extended the VLA architecture with **tactile input** as an additional observation modality alongside vision and language, targeting **contact-rich manipulation**.
- Led **on-site integration and commissioning** of humanoid robots at customer facilities: requirements definition, hardware assembly, system integration, and sensor calibration, with direct exposure to the engineering effort that limits deployment of new robotic tasks.
- Deployed VLA and diffusion policies on **NVIDIA Jetson and Qualcomm NPU** platforms (TensorRT, AIMET, INT8/FP8 PTQ, CUDA Graphs), achieving **sub-30 ms** end-to-end latency for real-time humanoid control loops.
- Developed real-time **3D perception** pipelines (detection, segmentation, tracking, 6D pose estimation, depth fusion) feeding manipulation policies.
- Built the **Edge AI MLOps pipeline** for model versioning, systematic evaluation, and staged OTA rollout with rollback across robot fleets.

AI Software Engineer, Huber Automotive AG

Ulm, Germany · Dec 2022 – Sept 2024

- Built multi-modal perception pipelines combining **camera, LiDAR, and radar** for autonomous mobility and target-tracking applications using C++, Python, and ROS2.
- Developed TensorRT-optimized **human and object detection** models with INT8 quantization for real-time inference on embedded hardware under strict memory and power limits.
- Designed global and local **motion planning** algorithms for autonomous navigation in constrained environments.
- Contributed to **VePipe**, an industry collaboration with **Fraunhofer IPA** on a certifiable, reproducible AI development pipeline with standardized testing and traceability for embedded robotics.

AI Research Intern, Reliev

Nantes, France · Dec 2021 – Sept 2022

- Conducted an extensive **literature review on multimodal biosignal analysis and deep learning architectures** for seizure and motion detection.
- Designed and trained **deep learning models for biosignal and motion pattern recognition** using CNNs and RNNs on ECG and IMU data.
- Built end-to-end **data ingestion and preprocessing pipelines** (FastAPI, InfluxDB) for signal fusion, noise filtering, and active learning.

- Developed machine learning models to analyze speech input of emergency calls for the NHS, United Kingdom.
- Designed and built a data lake on AWS with **Apache Spark, Kafka, and Airflow**, plus Presto, SQL Server, Postgres, and DynamoDB.

- Analyzed large-scale telecommunications data using data warehousing and ETL techniques; built Python and Selenium automation frameworks.

SELECTED PROJECTS

glove-gapgithub.com/adithyab94/glove-gap

Quantified how work gloves degrade 3D hand-pose estimation for human-video robot training data (DexYCB, 8 views; MediaPipe, WiLoR, HaMeR). Isolated thickness, not colour, as the cause; a second camera fixes hand position but not finger pose. Produced a capture specification with a reprojection-based batch quality gate.

smolvlm2-actgithub.com/adithyab94/smolvlm2-act

Converted SmolVLM2-500M into a manipulation policy via action tokenization, trained end to end on LIBERO-Goal. Ablations traced instruction-ignoring behaviour to token collisions and frame sampling; a windowed sampler fixed it and gave the first closed-loop successes (20%).

jetson-gr00t-observergithub.com/adithyab94/jetson-gr00t-observer

Open-source profiling toolkit for GR00T N1.5 TensorRT inference on Jetson: per-engine latency breakdown of the ViT, LLM and DiT action head with Prometheus/Grafana, quantifying the rate mismatch that motivates asynchronous VLA execution.

TECHNICAL SUMMARY

Programming languages	Lan- Python, C++, CUDA C++, C, Matlab
Robot Learning	Imitation learning, reinforcement learning, VLA / diffusion policies, LoRA / PEFT fine-tuning
Robotics & Control	Kinematics and dynamics (Newton–Euler, inverse kinematics), motion planning, ROS 1 & 2, FastDDS, Zenoh, micro-ROS
Simulation	MuJoCo, Gymnasium, Isaac sim, Newton
ML Frameworks	PyTorch, TensorFlow, ONNX, single-node multi-GPU training
Edge Inference	TensorRT, AIMET, INT8/FP8 PTQ, custom plugins, CUDA Graphs, Nsight Systems/Compute; Jetson AGX Orin, Thor, IGX Orin
Infrastructure	Docker, Kubernetes, GitLab CI/CD, Spark, Kafka, Airflow, AWS S3
Languages	English (Fluent), Tamil (Native), French (B1), German (A2)

REFERENCES

Prof. Olivier Kermorgant

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Prof. Eric Le-Carpentier

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