

ADITYA RAMCHANDRA PATAKI

Robotics & Perception Engineer | AI-Based Autonomous Driving

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Available immediately | EU Blue Card eligible on the strength of a German degree

Open to relocation across the EU



PROFILE

Robotics and perception engineer with an M.Sc. in Electromobility specialising in AI and Autonomous Driving. Two years at Valeo across internship, working-student and thesis roles — from ROS and sensor integration on an ADAS prototype vehicle to transformer-based radar perception and LiDAR scene flow. Strongest in Python and PyTorch; works in C++ within ROS, on embedded Linux and NVIDIA Jetson.

PROFESSIONAL EXPERIENCE

Valeo Schalter und Sensoren GmbH, Kronach, Germany

07/2023 – 06/2025 | 24 months

Master's Thesis | Radar & LiDAR Perception

01/2025 – 06/2025

Thesis: End-to-End AI Radar Signal Processing Including Doppler. Graded 1.0.

- Extended T-FFTRadNet, a published transformer-based radar architecture, with a Doppler-aware velocity head — predicting occupancy, object detection and continuous radial velocity together on one dense polar bird's-eye-view grid.
- Established that clustering-based scene flow could not supply the required ground truth: DBSCAN and HDBSCAN both fragmented between frames under sparse sampling, and control runs on nuScenes and Waymo confirmed the failure was structural rather than parametric.
- Built DirectFlowMatch instead — a physics-informed LiDAR scene-flow algorithm estimating per-point 3-D motion without clustering, segmentation or noise removal; benchmarked on the public nuScenes dataset and used to generate dense velocity ground truth.
- Improved radar occupancy-grid detection, raising true-positive rate from 64.5% to 68.0% at a fixed 0.75 confidence threshold on a highway sequence.
- Worked within Valeo's existing codebase, aligning weekly with the team, the company supervisor and the university professor.

Robotics Software Engineer | Working Student

01/2024 – 12/2024

LiDAR point-cloud compression.

- Investigated whether 3-D point clouds could be preconditioned — restructured or reordered before compression — to make a lossless codec work harder.
- Implemented and benchmarked several preconditioning strategies across spatial partitioning, clustering and reordering approaches, measuring compression ratio and runtime against an unpreconditioned baseline with reproducible test setups.
- Validated the findings against the assessment of the author of the compression codec used, at a US national laboratory.
- Documented the outcome and preserved the implementation in the codebase with recovery steps. Specifics remain internal to Valeo.

Robotics Software Engineer | Internship

07/2023 – 12/2023

"Droid" — an ADAS-equipped prototype vehicle. Sensing, embedded compute, teleoperation.

- Maintained and extended the Droid's ROS-based software on an NVIDIA Jetson under embedded Linux — extending existing C++ nodes, writing one node independently, with Python for tooling and analysis.
- Implemented 4G/5G remote teleoperation with low-latency UDP transport and demonstrated live vehicle control with the operator in Erlangen and the vehicle 100 km away in Kronach.
- Built the live video pipeline in GStreamer, streaming four onboard cameras simultaneously to the remote operator.
- Diagnosed and fixed faults at the hardware–software interface, from actuator behaviour and control-signal interference to Linux build failures, keeping the vehicle reliably demonstrable.

- Demonstrated the teleoperated prototype live to Valeo's division CTO, regional government representatives and press.

TNBI Industries Pvt Ltd · Pune, India

Junior Design Engineer

01/2022 – 06/2022

- Turned customer requirements into manufacturable designs for industrial scrubber systems, coordinating with clients, vendors and fabricators through to fabrication.
- Produced 3-D CAD models and manufacturing drawings in SolidWorks and Solid Edge; checked designs for manufacturability and cost before release.

Armament Research & Development Establishment (ARDE-DRDO) · Pune, India

Research Trainee | Bachelor's Thesis

10/2020 – 06/2021

Thesis: Parametric Modelling and Regression Burning of Propellant Grains. Graded 1.0.

- Modelled solid-propellant burn-back in MATLAB, predicting engine performance from propellant grain geometry, and validated the model against reference burn-rate data.
- Built an interactive dashboard letting engineers change design parameters and immediately see predicted performance.

EDUCATION

M.Sc. Electromobility (ACES): AI and Autonomous Driving — Grade 1.8

10/2022 – 03/2026

Friedrich-Alexander-Universität Erlangen-Nürnberg · Erlangen, Germany

- Relevant coursework: Autonomous Driving, Machine Learning, Computer Vision, Robotics (ROS 2), Algorithms, Programming and Data Representation.
- Thesis: End-to-End AI Radar Signal Processing Including Doppler. Graded 1.0.

B.Eng. Mechanical Engineering — Grade 1.9 (German equivalent)

06/2018 – 07/2021

Savitribai Phule Pune University · Pune, India

- Relevant coursework: Control Systems, Numerical Methods, CAD/CAM, Mechatronics, Programming (Python and MATLAB).
- Thesis: Parametric Modelling and Regression Burning of Propellant Grains. Graded 1.0.

TECHNICAL SKILLS

Robotics & embedded: ROS 1 (Noetic) & ROS 2 (Humble), NVIDIA Jetson, embedded Linux, GStreamer, RViz

Perception & sensor data: LiDAR and radar perception, radar FFT, LiDAR point clouds, scene-flow and ego-motion estimation, occupancy-grid estimation, camera streams, sensor integration & synchronisation

Algorithms: physics-informed algorithm design, point-cloud registration (KISS-ICP), spatial data structures (KD-tree, octree), failure analysis & debugging

Machine learning: PyTorch, transformer architectures, CNNs, multi-task learning, metric design

Languages & tools: Python, C++, MATLAB, Bash, Git, Docker, CMake, Linux

Documentation & delivery: technical documentation, demonstration & delivery, cross-functional collaboration

LANGUAGES

English — Fluent (C1) · German — Intermediate (B1) · Hindi and Marathi — Native