

# Harish Natarajan Ravi

## Research Engineer

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## Professional Overview

Research Engineer with strong experience in C/C++ development and algorithm design for autonomous systems. Skilled in building robust software for environment modelling, object tracking, and perception.

I am eager to apply my expertise in ADAS, software optimization, testing, and system validation to complex mobility systems, delivering reliable and scalable autonomous driving solutions.

**Primary stack:** C/C++, Python, ROS2, ADAS, Perception, Sensor Fusion, SLAM, Git, TDD, ASPICE, CI/CD

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## Work Experience

**Software Development Engineer | Mercor | Leonberg, DE**

**Jan 2025 – Present**

**Tech stack:** C++, Python, Linux, PyTorch, TensorFlow, ML/DL Frameworks

- Enhanced model performance by optimizing Embodied AI architectures.
- Improved deployment efficiency by integrating models seamlessly into autonomous platforms.
- Increased system reliability by validating AI components using rigorous test pipelines.

**ADAS Research Engineer | Porsche Engineering | Mönsheim, DE**

**Sep 2023 – Sep 2024**

**Tech stack:** C++, Python, ROS, PCL, OpenCV, SLAM, Sensor Fusion, Git, Docker, CI/CD

- Built a complete SLAM-based parking map pipeline, improving localization accuracy.
- Boosted relocalisation robustness by integrating LiDAR and camera sensor fusion.
- Refined trajectory alignment by applying loop closure techniques to sensor data.
- Supported HMI development by implementing costmaps and stitched image renderings.
- Reduced test iteration time by evaluating real-time simulation and on-vehicle trial performance.

**System Development Engineer | Bosch GmbH | Stuttgart, DE**

**Mar 2023 – Aug 2024**

**Tech stack:** C++, Python, SysML, MBSE, IBM Rhapsody and DOORS, ISO Standards, Jira

- Strengthened system design clarity by modeling perception modules for L3 parking systems.
- Minimized ambiguity in specs by performing detailed ISO-compliant requirements analysis.
- Improved system validation coverage by executing traceable verification workflows.
- Supported cross-functional alignment by collaborating on requirement integration.

**Research - Software Engineering | Fraunhofer IEM | Paderborn, DE**      **Sep 2021 – Feb 2023**

**Tech stack:** Python, C++, MQTT, Eclipse HONO, Kubernetes, Grafana, Linux, Git

- Developed a car-to-cloud demonstrator to streamline F1 telemetry analysis.
- Contributed to an open-source SDV initiative by supporting integration with KUKSA stack.
- Enabled real-time data flow by implementing odometry and telemetry extraction modules.

**Software Development Engineer | Robert Bosch | Bengaluru, IN**      **Apr 2017 – Sep 2020**

**Tech stack:** C/C++, Python, Perl, AUTOSAR, TDD, ASPICE, IBM DOORS

- Delivered production-grade service layers by developing diagnostics for global OEMs.
  - Accelerated function validation by implementing and testing OBD/parking modules.
  - Improved platform scalability by contributing to reusable diagnostic infrastructure.
  - Ensured project stability by supporting release cycles with cross-functional teams.
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## Education

**Master's in Computer Engineering | Paderborn University, DE**

- Field of Study: Embedded Systems
- GPA: 1,8 (German Grade)

**Bachelor's in Electronics | Visvesvaraya Technological University, IN**

- Field of Study: Electronics and Communication
  - GPA: 2,3 (German Grade)
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## Theses and Research Works

- Master Thesis - Generation and Relocalization of Parking Maps
  - Radar-based perception to enable object detection.
  - Disaster Response Robots
  - Autonomous Vehicle Perception
  - Visual Odometry for Camera Motion Estimation
  - Depth Estimation using Transformer models
  - Object Classification and Detection using YOLO and RT-DETR models
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## Skills

**Languages:** English – Native Speaker, German – Intermediate (pursuing B1.1)

**Operating Systems:** Linux, Windows, WSL, QNX

**Software, Tools and Platforms:** ROS, CARLA, Machine and Deep Learning Frameworks, Functional Testing, TRACE32, CAN, Data Handling and Analysis, Docker, CI/CD, UML, Confluence, Nvidia Jetson

**Soft Skills:** Effective Communication, Problem Solving, Critical Thinking, Teamwork, Adaptability.