HARISH NATARAJAN RAVI

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Highly motivated and experienced research engineer with a strong C/C++, Python and Linux environment background. Skilled in Robotics, Autonomous Systems, ADAS, Computer Vision, Machine Learning and Deep Learning concepts and frameworks. Flexible to relocate to align with project needs and career growth.

SKILLS

Programming: C/C++, Python, Perl, Verilog, MATLAB/Simulink.

Operating Systems: Linux, Windows, WSL, QNX.

Software, Tools and Platforms: ROS, Sensor Fusion, SLAM, LiDARs and Cameras, CARLA, Machine and Deep Learning Frameworks, Unit and Functional Testing, TRACE32/UDE debugger, CAN, Data Handling and Analysis, Git, Docker, Jira, Confluence, CI/CD, UML, MBSE, Kubernetes, Nvidia Jetson.

Soft Skills: Effective Communication, Problem Solving, Critical Thinking, Teamwork and Collaboration, Time Management and Organization, Adaptability and Flexibility.

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

EDUCATION

Oct 2020 – Sep 2024

Masters in Computer Engineering | *Paderborn University* | *Paderborn, DE*

- Field of Study: Embedded Systems - GPA: 1,8

Sep 2011 – Jun 2015

B.Eng in Electronics and Communication Engineering | *Visvesvaraya Technological University* | *Bengaluru, IN*

- Field of Study: Electronics - GPA: 2,3

PROJECTS AND CERTIFICATES

- Self-Driving Cars Specialization
- Machine Learning Specialization
- Deep Learning Specialization
- Autonomous Vehicle Perception
- Visual Odometry for Camera Motion Estimation
- Object Classification using YOLO models
- Depth Estimation using Transformers
- Object Detection and Tracking using RT- DETR

WORK EXPERIENCE

Jan 2025 – Present

Software Development Engineer | *Full-time* | *Mercor* | *Leonberg, DE*

- Optimized Embodied AI models to enhance performance and efficiency.
- Integrated and deployed models into autonomous systems.
- Tested and validated models to ensure reliability through rigorous testing.

Sep 2023 – Sep 2024

ADAS Research Intern and Master Thesis | *Internship* | *Porsche Engineering* | *Mönsheim, DE*

- Designed and implemented parking map reconstruction pipeline using SLAM.
- Developed LiDAR and camera-based relocalisation modules for the generated parking map.
- Employed loop closure for parking map trajectory utilizing sensor data.
- Evaluated the real-time performance of the pipeline on the vehicle and in simulations.
- Implemented image rendering, stitching methods and costmap generation for HMI parking functions.
- Enhanced the performance of parking assist systems.

Mar 2023 – Aug 2023

System Development and Modelling Engineer | *Work-Student* | *Bosch GmbH* | *Stuttgart, DE*

- System development, modelling, and engineering for Video Perception modules.
- Performed comprehensive requirements analysis for L3 camera-based parking assist systems.
- Conducted verification and validation of requirements, ensuring compliance with ISO specifications.
- Collaborated with cross-functional teams to ensure system reliability and performance in parking functions.

Sep 2021 – Feb 2023

Research Assistant – Software Engineering | *Work-Student* | *Fraunhofer IEM* | *Paderborn, DE*

- Responsible for the development of a car-to-cloud demonstrator using F1 data.
- Contributed to the KUKSA research project (BOSCH | COVESA – SDV project).
- Implemented odometry and telemetry data extraction using Python, C++, and Eclipse HONO.

Apr 2017 – Sep 2020

Software Development Engineer | *Full-time* | *Robert Bosch India* | *Bengaluru, IN*

- Developed service layer functionalities for the DCM package (AUTOSAR, ASPICE, TDD).
- Implemented functions for the OBD and parking function modules to serve ASW components.
- Enhanced diagnostics infrastructure for OEMs: Daimler, VW, BMW.
- Responsible for debugging and testing of OBD functional modules.
- Experience in Functional Safety, Diagnostics, ADAS/AD, and ECU protocols.
- Worked closely with cross-functional team for platform release activities.

Jun 2015 – Apr 2017

Software Technical Analyst | *Full-time* | *IBM India* | *Bengaluru, IN*

- Implemented test automation scripts using DCL and worked on functional tasks using C/C++ and Python.
- Planned and worked independently to perform server node migrations, Cluster booting and other activities.
- Supported maintaining 99.6% SLA availability as a Software and System Analyst.

THESES AND RESEARCH WORK

Generation and Relocalisation of Parking Maps

- Designed and implemented a parking map pipeline using SLAM algorithms.
- Reconstructed and relocalised the vehicle within the generated parking map.
- Evaluated the real-time performance of the pipeline in vehicle and simulation.
- Enhanced the performance of parking assist systems.

Disaster Response Robots

- Implemented LOAM pipeline to map and localise the environment.
- Enhanced the real-time performance of the pipeline using loop closure detection methods.
- Designed and developed an abstraction to plugin key points extraction and descriptor algorithms.

Design, Simulation and Implementation of an Optimal Adaptive Filter

- Designed and developed Adaptive Filtering techniques for speech signals in a noisy environment.
- Implemented Adaptive Algorithms on Xilinx Spartan 6 FPGA.
- Optimized FPGA designs for resource efficiency and low power.
- Solved varying background noise in speech signals.

REFERENCES

- **Prof. Dr. Erdal Kayacan <erdal.kayacan@upb.de>**
- **Prof. Dr. Bärbel Mertsching <mertsching@upb.de>**
- **Ing. Jing Gong <jing.gong@porsche-engineering.de>**

DECLARATION

I hereby declare that the details provided above are true and accurate to the best of my knowledge and belief.

Harish Natarajan Ravi

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