RONY SHAJI

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Over five years of professional experience, including two years in agile software development, and ADAS simulation. Strong knowledge in mathematical modeling, data structures, and machine learning, combined with a strong interest in innovative automotive technology and looking for opportunities as a software engineer.

Skills

Programming Languages: C++, Python, C, Bash
Tools & Technologies: CARLA, ROS, Docker, Git, CI/CD, Jenkins, CMake, HTTP REST
Development Tools: Linux, Visual Studio, WSL

Work Experience

Research Assistant
Technische Hochschule Ingolstadt, Germany   Sep 2024 - Current

- Implemented a Vehicle Security Operations Center (VSOC) with an HTTP REST API for communication between vehicles and infrastructure, developed using Docker, based on JSON, and deployed on AWS Cloud.
- Developed and implemented a Car2X software stack in C++ and ROS for vehicle-infrastructure communication on NVIDIA Orin, using FlatBuffers for efficient serialization.
- Optimized the COHDA Embedded Device Stack in C for deserializing V2X messages, expanding processing capabilities from one to three types (CAM, CPM, DENM).
- Increased V2X communication efficiency by 10% through the implementation of a new ETSI standard and optimized C++ programming within the team.
- Deployed and installed newly developed ROS packages for real-time V2X communication in a prototype vehicle and infrastructure, conducting real-time testing on a sensor-equipped test field.
- Utilized TCP/UDP protocols to establish reliable communication between the COHDA device and the testing system, ensuring efficient data exchange for V2X testing and system validation.

Working Student – Car2x and Sensor Fusion
Fraunhofer IVI, Ingolstadt, Germany   Jan 2024 – July 2024

- Improved object detection accuracy through extrinsic camera calibration with LIDAR and contributed to the implementation of sensor fusion using Kalman filter.
- Contributed to the V2X communication project by configuring the NVIDIA Jetson AGX ORIN and deploying the software stack in the test field.
- Created a virtual map in CARLA as part of the Digital Twin and collected synthetic data for neural network training.

Master Thesis in Virtual ADAS Function Validation
Porsche Engineering Services GmbH, Mönsheim, Germany   May 2023 – Nov 2023

- Topic: Digital Twin: Development and Validation of an ADAS Function in Simulation [GitHub]
- Added two modules to the Reversing Assist ADAS function and validated them within the internal simulation framework using CARLA and ROS.
- Performed tests on a ROS-based prototype vehicle (Porsche Cayenne) using Python and C++ and integrated the feedback to enhance the virtual implementation.
- Tested and validated the ADAS function (Reversing Assist) using a custom OpenDRIVE map and OpenSCENARIO approach with CARLA Scenario Runner in Ubuntu WSL
- Enhanced software development practices by applying Scrum methodology and utilizing tools such as Git, CMake, JIRA, and Confluence for efficient project management and collaboration.

ADAS Virtual Sensor Simulation Intern
Magna Telemotive GmbH, Ingolstadt, Germany   Aug 2022 – Jan 2023

- Created a proof-of-concept with 7 different simulation software for ADAS and set up CARLA for the integration of 3D models into the simulation environment.
- Developed a Git repository for a CI/CD pipeline, streamlining the software development process and enhancing team collaboration.
- Expanded the simulation to represent sensor FOVs (camera sensors) and created blueprints in Unreal Engine, integrating them into CARLA using C++ for ADAS testing.

Development Engineer
Madras Rubber Factory (MRF) Tires Ltd, India   Apr 2017 – Mar 2021

- Collaborated with OEMs to demonstrate product quality and functionality while ensuring compliance with industry standards and customer requirements through testing and validation.
- Responsible for implementing OSHAS ISO 45001:2018, ensuring compliance with occupational health and safety standards.

Education

Master of Engineering – International Automotive Engineering
Technische Hochschule Ingolstadt, Germany   Mar 2021 – Jul 2024

Grade: 1.8 / 4.0

Courses: Mathematical Modelling & Simulation, Machine Learning, Vehicle Dynamics, Power Train, Vehicle Crash Mechanics, Sensor Technology & Signal Processing and Integrated Safety

Bachelor of Technology - Mechanical Engineering
Mahatma Gandhi University, India   May 2012 – May 2016

Grade: 1.8 / 4.0

Professional Projects

- **Snake Game in C++ with OOP and Concurrency** (GitHub)   Nov 2024 – Feb 2025
  Developed a classic Snake game using OOP, multithreading, and memory management for optimized gameplay.
- **Traffic Simulation using C++ Concurrency** (GitHub)   Jan 2025
  Developed a C++ traffic simulation with concurrency, implementing thread-safe traffic lights for safe and efficient vehicle movement.
- **C++ Memory Management Chatbot** (GitHub)   Jan 2025
  Created a simple chatbot using C++ memory management concepts, including raw and smart pointers.
- **Linux System Monitor with C++** (GitHub)   Dec 2024
  Built a C++ System Monitor application using OOP principles to provide real-time information on system resources and processes.
- **OpenStreetMap Route Planning with C++ and A*-Algorithm** (GitHub)   Nov 2024
  Implemented the A* search algorithm in C++ to calculate the shortest route between two points on an OpenStreetMap.
- **CARLA-based Tutorials** (YouTube)   Oct 2024
- **Object Detection with YoloV7** (GitHub)   Mar 2023
- Investigated the impact of vehicle color on the accuracy of LIDAR-based recognition systems.   Mar 2022

Certifications

- **Udacity Nanodegree in C++**   Nov 2024 – Feb 2025
  C++ Foundations, Object-Oriented Programming, Memory Management, Concurrency
- **Code with mosh – Ultimate C++**   Aug 2024 – Sep 2024
- **Machine Learning with Python, Python Data Structures, Programming for Everybody.**   April 2024

Languages

English (C1) | German (B1) | Malayalam | Tamil | Hindi