RONY SHAJI

SOFTWARE ENGINEER

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Over 5 years of professional experience, including 2 years in agile software development, V2X communication and ADAS Simulation. Comprehensive knowledge in mathematical modeling, data structures, and machine learning, combined with a strong interest in innovative automotive technology and looking for C++ based V2X communication opportunity.

Skills

Core Competencies: Embedded Systems, Sensor Fusion, ADAS Simulation, Software Development

Programming Languages: C++, Python, C

Development Tools: Docker, Git, JIRA, CMake, Linux, Visual Studio, CI/CD

Tools & Technologies: CARLA Simulator, ROS, OpenDRIVE, OpenSCENARIO, Unreal Engine, WSL

Work Experience

Research Assistent
Sep 2024 – Current
Technische Hochschule Ingolstadt
Ingolstadt, Germany

- COHDA Embedded Device: Worked with the COHDA embedded software stack in C to optimize the deserialization of V2X messages.
- V2X Software Stack (ETSI, ROS, C++): Developed and implemented a high-level C++-based V2X stack in ROS for communication between infrastructure and vehicles, including the use of FlatBuffers (serialization) on NVIDIA Orin.
- Performance Optimization: Improved CPM communication efficiency by 10% through the implementation of the ETSI TS 103 324 standard and advanced C++ programming techniques.
- Real-time Testing: Tested CAM, CPM, and DENM V2X messages on a sensor-based test field using prototype car.
- User Interface: Developed an OpenStreetMap-based GUI for visualizing detected objects.

Working Student
Jan 2024 – July 2024
Fraunhofer IVI
Ingolstadt, Germany

- Object Detection and Tracking: Improved detection accuracy through extrinsic camera calibration with LIDAR.
- NVIDIA Jetson AGX ORIN: Configured by flashing the V2X software stack and deployed on a test field.
- Digital Twin: Implemented the test field in the CARLA simulator for data collection to train neural networks.

Master Thesis
May 2023 – Nov 2023
Porsche Engineering Services GmbH
Bietigheim-Bissingen, Germany

- Topic: Digital Twin: Development and Validation of an ADAS Function in Simulation - **https://github.com/ronyshaji/Master-Thesis**
- Reversing Assist: Integration and enhancement of the ADAS function in the CARLA simulator using C++ and ROS.
- Testing and Validation: Performed tests on a ROS-based prototype vehicle (Porsche Cayenne) using Python and C++.
- Advanced ADAS Functionality: Validated with CARLA Scenario Runner using OpenDRIVE and OpenSCENARIO in Ubuntu WSL.
- Software Development Methodology: Improved knowledge in Scrum and tools like Git, CMake, JIRA, and Confluence.

Intern
Aug 2022 – Jan 2023
Magna Telemotive GmbH
Ingolstadt, Germany

- ADAS Virtual Simulation: Simulated a virtual camera sensor for ADAS testing in a parking lot scenario.
- Unreal Engine: Created blueprints and integrated them into CARLA using C++.
- Proof-of-Concept (POC): Developed a solution to select the best simulator for ADAS testing.

Development Engineer
Apr 2017 - Mar 2021

Madras Rubber Factory (MRF) Tires Ltd — Chennai, India

- Development Engineer: Collaborated with OEMs to demonstrate product quality and functionality.
- Testing and Validation: Ensured compliance with industry standards and customer requirements.
- OSHAS ISO 45001:2018: Member of the implementation committee, responsible for occupational health and safety standards.

Education

C++ Nanodegree Program
Nov 2024 – Current

Udacity — Online

- C++ Foundations, Object-Oriented Programming, Memory Management, Concurrency

Master of Engineering – International Automotive Engineering
Mar 2021 - Jul 2024

Technische Hochschule Ingolstadt — Ingolstadt, Germany

- **Fakultät Elektrotechnik und Informationstechnik**
- **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
May 2012 - May 2016

Mahatma Gandhi University — Kerala, India

- **Grade: 1.8 / 4.0**

Professional Projects

- **C++ Memory Management Chatbot** : (https://github.com/ronyshaji/Memory_Management_ChatBox_CPP)
- **Linux System Monitor with C++** : (https://github.com/ronyshaji/Linux_System_Monitor)
- **OpenStreetMap Route Planning with C++ and A*-Algorithm:** (https://github.com/ronyshaji/Build_OpenStreetMap_Route_Finder)
- **Object Detection with Deep Learning**: (https://github.com/ronyshaji/Number-Plate-Detection-Yolov7)
- Investigated the impact of vehicle color on the accuracy of LIDAR-based recognition systems.
- Air Cooling Simulation and Analysis for Prismatic Lithium-Ion Battery Modules
- **CARLA-based Tutorials:** (https://www.youtube.com/watch?v=wdeHxZKWaIc)

Certifications

- **Udacity - Nanodegree in C++ (Ongoing)**
- Machine Learning with Python, Python Data Structures, Programming for Everybody
- Code with mosh – Ultimate C++

Languages

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

Hobbies and Interests

Cycling | Hiking | Travel | Formula 1 | Blogging