Jishnu Periya

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Profile Summary

C++ systems and middleware engineer focused on high-performance, deterministic software, modern C++17/20 library design, and systems correctness. Experienced in building reusable core infrastructure, validation frameworks, and tooling for complex, performance-critical systems.

Technical Skills

Programming Languages: C++ (modern C++17/20), Python, MATLAB, C, Bash

Frameworks & Libraries: Qt (Core), ADTF 3.x, OpenCV, HDF5 C/C++ API, Innoviz LiDAR SDK

Build & Dependency Management: CMake, Conan

Testing: doctest, RapidCheck (property-based testing)

Tools and environments: Visual Studio, Qt Creator, Git

Data Formats and Protocols: HDF5, MF4 (ASAM MDF 4), JSON, XML

Operating Systems & Networking: Linux, Windows, UDP/IP, Ethernet, CAN, Flexray

Experience

Open-Source C++ Systems Development, Ingolstadt, Germany   01.2026 – Present

Mentored by a Principal Engineer — Compiler & Runtime Systems

- Full-time open-source C++ systems development and research, focused on reusable core libraries, deterministic behavior, and systems correctness.
- State Estimation Validation Engine: Architecting a C++20 simulation framework to validate EKF performance by generating deterministic synthetic trajectories and ground-truth sensor data.
- Harmony Core — C++20 Symbolic Systems Engine: Developing a header-only library to model complex semantic relationships, serving as a testbed for C++20 Concepts and value-semantic API design.
- Implementing STL-compatible iterators and custom allocators to ensure zero-cost abstractions, verified through property-based testing (RapidCheck) and doctest.

C++ Systems / Middleware Engineer, TechHub by e:fs – Ingolstadt, Germany   04.2021 – 12.2025

(Client projects for AUDI and CARIAD)

(Role concluded due to company-wide dissolution of the Autonomous Driving department)

- Designed and implemented a comprehensive object-detection evaluation pipeline leveraging high-precision GNSS/INS (IMU) ground truth, LiDAR sensor data, and calibration parameters, including temporal synchronization and multi-sensor data fusion to assess spatial accuracy, temporal consistency, and detection reliability in real-world driving scenarios.
- Developed geometry-based perception evaluation pipelines using HD map data, including Detailed Lane Markings (DLM), performing geometric association and fusion between LiDAR-derived features and map-based lane geometry to validate lane detection accuracy under varying environmental conditions.
- Implemented HDF5-based data serialization pipelines using the C/C++ API for structured storage of perception outputs, geometric metadata, and evaluation results, enabling reproducible large-scale offline analysis aligned with ISO 23150.
- Designed and implemented ADTF 3 C++ filters for LiDAR point-cloud acquisition, object and geometry recording, real-time streaming, and live visualization, including precise timestamp alignment and system-wide time synchronization.

- Developed ADTF-based data acquisition modules for GNSS/INS, CAN, and FlexRay, enabling synchronized recording and replay of heterogeneous vehicle and sensor signals for perception validation and system debugging.
- Built and maintained the complete sensor data collection and validation infrastructure for autonomous prototype vehicles, integrating LiDAR, cameras, GNSS/INS, and vehicle buses using C++ and ADTF within complex experimental system configurations.
- Implemented high-performance UDP parsing and decoding modules for Ethernet LiDAR sensors, including packet reassembly, payload parsing, and timestamp alignment for deterministic downstream processing.
- Developed visualization and inspection tooling for point clouds, object geometry, and perception outputs, including Qt and QML-based modules for LiDAR blockage and coverage analysis to support sensor validation and fault detection.

C++ Software Engineering Intern, TechHub by e:fs – Ingolstadt, Germany   09.2019 – 02.2020
(Client project for AUDI)

- Optimized performance and accuracy of a production C++ GNSS/INS localization module
- Integrated Python-based Bayesian optimization to tune parameters of performance-critical C++ components

Research Assistant (HiWi) – Driving Trajectory Prediction, CARISSMA Institute   04.2019 – 08.2019
of Safety in Future Mobility – Ingolstadt, Germany
- Vehicle dynamics modeling and trajectory prediction (bicycle vs. CV models) in MATLAB/C++.

Werkstudent – Engineering Tools, IAV GmbH – Ingolstadt, Germany   10.2018 – 08.2019
- Automated ECU data processing tools (Visual Basic).

Education

M.Eng. Automotive Engineering (Vehicle Safety – Control & Sensing),   04.2018 – 03.2021
Technische Hochschule Ingolstadt

- Focus: Safety-critical system design, control, sensing, and validation.
- Master's Thesis (Industry collaboration — e:fs TechHub): Signal-processing–based detection and classification of vulnerable road users using micro-range and micro-Doppler radar signatures from a radar sensor (Grade: 1.0).
- Final Grade: 1.4 | Scholarship recipient for academic excellence (Bavarian Ministry for Science and Arts)

B.Tech Mechanical Engineering, University of Kerala, India   08.2013 – 07.2017

- Focus: Dynamics, control fundamentals, and engineering mathematics.
- Final Grade: 8.8/10 (German equivalent: 1.6) | Best Bachelor's Thesis Award

Additional Information

- Permanent Residency (Niederlassungserlaubnis), full work rights
- Open to relocation within Germany
- Driving license: Class B

Languages

- English — C2 (Fluent)
- German — B2 (Professional working proficiency)