# PRERONA GHOSH

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## SUMMARY

Software Engineer with 4 years of experience in Linux-based embedded systems, multimedia processing and real-time applications. Proficient in software design, development, hardware-software integration, documentation, feasibility analysis, and maintenance of legacy systems. Strong analytical and communication skills, with the ability to collaborate effectively with clients and cross-functional teams. Hands-on experience with Linux build systems, cross-compilation, and CI/CD pipelines. Contributed to Agile-based project planning and development to ensure timely delivery and customer satisfaction.

## TECHNICAL SKILLS

o   Programming Languages: C, C++ 11/14, Python
o   Tools & Frameworks: CMake, Conan Package Manager, GoogleTest, CUnit, Git, MKS, Jira, Docker, Shell Scripting, UML, Object Oriented Programming, Data Structures, Design Patterns, Multithreading, Boost, OpenVX, Gstreamer, AWS KVS, GCC, Ffmpeg, Tcpdump, Wireshark, Jenkins, Github Actions, CI/CD, TCP, IPv4/v6, UDP, RTP
o   Automotive Systems: Classic and Adaptive Autosar, UDS for Diagnostics (ISO 14229), Functional Safety (ISO 26262), CAN, Vector CANalyser
o   Operating Systems: Linux, QNX RTOS, EBLinux, Windows
o   Methodologies: Agile, Scrum, SDLC, Test Driven Development

## EDUCATION

**University of Waterloo**                                                                      **January 2023 - April 2024**
**Master of Engineering in Electrical and Computer Engineering**
**Relevant Coursework:** Software Engineering, Computer Architecture, Computer Networks, Machine and Deep Learning, Natural Language Processing
*Grade*: 3.87/4

**SRM Institute of Science and Technology (India)**                                     **May 2015 – May 2019**
**Bachelor of Engineering in Electronics and Communication**
**Relevant Coursework:** C/C++ Programming, Operating Systems, Analog and Digital Hardware Design
*Grade*: 9.27/10

## WORK EXPERIENCE

**Ford Motor Company**                                                                           **March 2024 – May 2025**
**Software Developer**                                                                                        **Waterloo, ON**

Developed middleware framework for image and multimedia processing, shared memory communication across SoCs, and Compute-as-a-Service application as part of Ford's FNV4 architecture.

o   Development of an adaptive autosar service that would handle asynchronous requests, as a testing tool to mock out dependencies on other components and enable integration testing
o   Developed a performance optimized kernel-based framework with support for shared memory transport, multimedia streaming, and image processing applications, capable of handling multiple requests in parallel and asynchronously
o   Developed an RTP-to-WebRTC relay application to transmit network-received camera data to the cloud, enabling real-time streaming using the GStreamer framework and AWS Kinesis Video Streams SDK
o   Packaged the custom kernels of the framework for deployment on both QNX Neutrino RTOS and Linux systems, utilizing QNX Software Development Platform(SDP), and cross-compilation toolchains for target-specific builds.

o Separated OpenVX specific functionality from the shared memory implementation into multiple shared libraries, streamlining the design and eliminating redundant compile and runtime dependencies, which improved maintainability and enabled independent use
o Implemented classes for tracking thread activity, recursive calls and race conditions for use across large C++ codebase
o Implemented internal logging with configurable log levels and custom exception classes to enable runtime error reporting, controlled recovery, and uninterrupted execution across future processing cycles, independent of underlying libraries
o Experiment with GStreamer pipelines to improve multimedia performance by reducing buffering in consumer, stabilizing behaviour of pipelines, hardware H264/H265 encoders and decoders used in production environments
o Developed functional tests using Python for black box testing of Public APIs using pyvx and aracom bindings
o Created advanced Python scripts to automate the analysis of complex dependency files and generate comprehensive output reports

**Ford Motor Company**                                                        **September 2023 – December 2023**
**Platform Software Developer Intern**                                        **Ottawa, ON**

o Explored OpenVX, OpenCV, GStreamer frameworks, threading APIs, TIOVX APIs for POSIX, QNX and Adaptive AUTOSAR platforms
o Studied Adaptive Autosar specifications for Communication Management, ara::com APIs, Persistency Management
o Implemented syntax enforcement for controlled access to shared memory data, preventing data races at compile time
o Optimized shared memory handles for faster multi-process operations and lower memory consumption
o Development of unit tests using GoogleTest framework for C++ and increased coverage of codebase by 30%
o Developed test fixtures to reduce code duplication, code smells and improved code quality by 65%

**Continental Automotive Pvt Ltd**                                            **October 2019 – October 2022**
**Software Engineer**                                                         **Bangalore, India**

Lead the development of Japanese OEM projects on the latest hardware product. Spearheaded the development and verification of diagnostics and variant coding software on second-generation brake-by-wire systems. Improved development workflow times by creating new internal tools to speed up documentation processes.

o Design and development of software architecture for new features as per project requirements using Embedded C
o Wrote unit tests for software, performed integration and hardware testing on HECU
o Benchmarking, debugging and problem solving using profiling and debugging tools for defects identified at all stages of product development lifecycle and providing bug fixes within deadlines
o Low-level optimization of legacy features in software for further reuse and porting to latest architecture
o Analysis of software requirements, preparation of design documentation to meet ASPICE standards
o Supporting walkthroughs, peer reviews, and inspections through all development stages
o Supported meetings for cross-functional collaboration for software development, test and requirements with external teams and customers
o Provided direct support and explanation to customers with respect to software changes for every release
o Working within an Agile team to ensure proper planning of development topics for the current sprint and followed up on the activities assigned during scrum