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Embedded Software Engineer - Real-Time Systems Application

Dear Hiring Team,

I am thrilled to apply for the Embedded Software Engineer - Real-Time Systems position at Alpine Eagle GmbH, inspired by your ongoing contracts with the German Bundeswehr and other government agencies, achieving seven-digit revenues in your first year as part of Sentinel-OS development, as stated in a post on HTGF. Your pioneering work in counter-drone technology motivates me to contribute my embedded systems expertise to your innovative team in Karlsruhe.

During my Master's program, focusing on IoT health solutions, I utilized STM32CubeIDE and C for firmware development on an STM32 microcontroller to build a wearable health monitoring device. The system integrated sensors for vital signs (temperature, SpO2, heart rate, humidity, ambient temperature, motion) using I2C and SPI for reliable data acquisition, while UART facilitated communication with an ESP WiFi module for wireless data transfer to a local server hosting a web GUI. Key firmware modules were developed to manage sensor polling, GPIO for LED indicators, and an emergency button. I also optimized power consumption for a 5-hour battery life using STM32 sleep modes. The web interface enabled real-time data visualization and historical analysis, accessible via any browser on the local network. Parallel to my academic pursuits, during nine months at AVL, I worked on the Adaptive AUTOSAR middleware (Service Oriented Architecture) and developing its applications in C++. These Adaptive Applications were deployed on a custom Real Time Linux Operating System using Yocto project. After this, I continued at AVL for my Master's thesis, where I was tasked with upgrading their legacy FMU Generation Utility (written in C++) from the FMI 2.0 to the FMI 3.0 standard, thereby enhancing the functionality of the existing tool for Co-simulation of automobile parts built in different systems like MATLAB, C++ etc. In my Thesis, I also leveraged Google Protocol Buffers (ProtoBuf) through ASAM OSI for efficient data serialization, streamlining integration of sensor and environmental models in driving simulations, enhancing virtual testing capabilities. At Persystems, I was a Junior C++ Developer, where I developed Virtual TestBench, a Qt Desktop application for simulations of electrical components, leveraging Persystems' proprietary library. My responsibilities included designing the UI/UX in the Qt Creator IDE with C++ to ensure a seamless user experience. I have also implemented the application's logic by connecting UI widgets to custom slots, using Qt's signal-slot mechanism to manage data flow between the UI and the backend operations interfacing with Persystems' testbench library. Additionally, I have built a separate license check application for Virtual TestBench using Qt and C++.

Drawing from my Master's work where I developed IoT health solutions in C and managed complex C++ projects at AVL, alongside my current role at Persystems refining simulation software, I am well-prepared to excel as an Embedded Software Engineer at Alpine Eagle GmbH. My extensive experience with C++ and STM32CubeIDE, demonstrated through developing a wearable health monitoring device with I2C, SPI, and UART protocols, aligns seamlessly with your need for real-time embedded software for Sentinel-OS. My hands-on expertise with real-time Linux systems using Yocto and protocols like MQTT and OPC-UA, honed during my AVL projects, equips me to handle device control, data acquisition, and low-level debugging for counter-drone systems. My background in CI/CD pipelines and automated testing at AVL and Persystems ensures I can maintain high-quality standards through code reviews and thorough testing, contributing to your hardware-agnostic platforms reliability and performance.

Among the many skills I have honed throughout my career, teamwork stands out as the most pivotal. My past experiences have emphasized the fundamental truth that sustainable solutions are often the result of collaborative efforts, rather than individual brilliance. I am eager to become part of the team and am committed to contributing my utmost from the very start, beginning immediately.

I would be greatly honored to receive an invitation for an interview.

Yours sincerely,
Milind