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Regensburg, 26.06.2025

Embedded Systems / Firmware Engineer for Mobile Robotics Application

Respected Hiring Team,

I am thrilled to apply for the Embedded Systems / Firmware Engineer position at N Robotics, a company making significant strides in the robotics industry with its recent partnership with a leading European logistics firm in June 2025. Your achievement in deploying autonomous mobile robots to boost warehouse efficiency by 30% through AI-driven navigation and real-time data analytics is truly inspiring. I am highly motivated to contribute my expertise in embedded systems and firmware development to support N Robotics' mission of revolutionizing industrial automation with cutting-edge mobile robotics.

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 developed its applications in C++. These Adaptive Applications were deployed on a custom Real-Time Linux Operating System using the 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, 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 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 built a separate license check application for Virtual TestBench using Qt and C++.

Drawing from my Master's work developing IoT health solutions in C and managing complex C++ projects at AVL, alongside my current role at Persystems refining simulation software, I am well-prepared to excel as an Embedded Systems / Firmware Engineer at N Robotics. My hands-on experience with STM32 microcontrollers, low-level protocols like I2C, SPI, and UART, and firmware optimization for power efficiency, as demonstrated in my wearable device project, directly aligns with your need for real-time firmware development and sensor integration for autonomous robotic platforms. My expertise in C/C++ and RTOS, coupled with my work on real-time Linux systems using Yocto at AVL, equips me to handle the design, bring-up, and debugging of embedded systems using tools like oscilloscopes and logic analyzers. Additionally, my familiarity with CI/CD pipelines and Git from AVL and Persystems ensures I can contribute to high-quality, production-ready hardware development. My collaborative experience across interdisciplinary teams at Persystems and AVL prepares me to work closely with your electronics and software teams to drive N Robotics' innovative mobile robotics solutions forward.

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 honoured to receive an invitation for an interview.

Yours sincerely,

Regensburg, 26.06.2025