

USMAN MEHMOOD

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Embedded Software Engineer

Technical Skills

- Tech Stack: C, .NET (C#), Python, Assembly, Bash, Structured Text (Beckhoff PLC).
- Embedded: RTOS (Zephyr, FreeRTOS), SPI, I2C, UART, CAN/J1939, Bluetooth, Bluetooth Mesh, MQTT.
- Tools & Standards: IEC 61508 (SIL-3), MISRA, FSoE, Git (CI/CD), CMake, Docker, KiCad.

Experience

Embedded Software Engineer at Safety System Products GmbH

Jan 2023 - Present

- Developed and certified a SIL-3 compliant industrial gateway, connecting wireless PLC systems to PROFINET and FSoE.
- Achieved 100% firmware code coverage by building a comprehensive HIL test suite, producing audit-ready verification evidence that directly supported certification.
- Built and maintained CI pipelines for firmware build, static analysis, and automated test execution, improving release reproducibility and reducing regression risk.
- Developed production and service tooling for mass programming, configuration, update, and repair workflows to support manufacturing and field servicing.
- Delivered an end-of-line assembly line test system using Beckhoff PLCs, integrated with the company ERP system for automated test traceability and manufacturing feedback.

Embedded Software Engineer at MRS Technologies, a division of MRS Electronic GmbH

July 2021 - Dec 2022

- Engineered low-power BLE mesh nodes and increased battery life from ~9 months to 3+ years through firmware optimization and hardware/algorithm tradeoffs, without degrading user experience.
- Architected and implemented an "IoT Core" framework in C to enable code reuse across a 10+ device home automation and energy management ecosystem, accelerating delivery and reducing platform risk during chip shortages.
- Built .NET middleware SDKs for industrial communication (CAN bus, Modbus RTU, Modbus TCP).
- Reverse-engineered telemetry protocols from solar inverters and industrial devices to integrate data into monitoring and energy-management systems.
- Led field application engineering for automotive-grade PLC deployments for customers in Dubai (UAE), supporting bring-up, integration debugging, and customer-facing technical execution.
- Developed tooling for SAE J1939 symbol composition/export across multiple formats for our PLC programming desktop app.

System Design Engineer at RISETech

Oct 2020 - June 2021

- Owned end-to-end embedded product development across firmware delivery, electronics refinement, and mechanical/system integration, driving prototypes toward product-ready implementation.
- Developed a wearable epileptic seizure detection armband under tight space/power constraints, balancing hardware tradeoffs and firmware architecture decisions.
- Improved legacy circuits and PCB layouts by adding safety/performance enhancements and optimizing designs for manufacturability and reliability.

Open Source Work

- Authored 'C/C++ Toolkit' for VS Code (20k+ downloads), filling a market gap for rapid multi-file C project scaffolding and lowering the entry barrier for C developers.
- Simulated autonomous path planning in C++ using 'Random Particle Optimization' for dynamic obstacle avoidance.

Embedded Systems Intern at Air University

June 2017 - Oct 2017

- Designed and built an intelligent energy monitoring system for homes and small buildings, delivering a functioning POC.
- Created schematics and PCB using KiCad, and handled enclosure assembly and wiring using SolidWorks mechanical integration.

Education

Bachelors in Mechatronics Engineering from Air University Islamabad

Sep 2016 - Sep 2020

Thesis on "Autonomous environmental 3D mapping using stereoscopic vision and SLAM".

Languages

English - CEFR level C2, German - CEFR level A2

Work Permit

EU Blue Card holder, eligible to work in Germany and other EU countries.