Muna Abu Jaber

munaabujaber@outlook.com
(387) 60-31-66-032
Sarajevo, Bosnia and Herzegovina
linkedin.com/in/muna-abu-jaber
github.com/munaabujaber

Embedded Systems Engineer

Embedded AI Engineer specializing in intelligent edge devices, with expertise in STM32 firmware, PCB design, and TinyML deployment. Combines 3+ years in automotive embedded systems with skills in motor control, FPGA development, and hardware-optimized AI to create efficient solutions. Experienced in full-stack embedded development, from custom PCB design to deploying ML models on resource-constrained devices. Excels in roles merging embedded systems with AI/ML, particularly for robotics, industrial IoT, and edge computing applications.

Work Experience

Automotive Embedded Systems & Test Engineer (Hybrid, Full-Time) — *August 2022 – Present*

***Maasu BH d.o.o.**, Sarajevo, Bosnia and Herzegovina*

- Worked closely with clients and engineering teams within the German automotive industry, following the V-model development process.
- Lead unit & integration testing of a harvesting robot, developed with Python and ROS in a Linux environment using pytest.
- Designed and executed C++ unit tests for electric drive systems in commercial vehicles using Google Test, ensuring robust coverage and compliance with automotive quality standards.
- Designed high-level software architecture diagrams and system-level test specifications using Enterprise Architect, based on requirements and use cases.
- Authored system-level test specifications and test cases for electric drive software in Codebeamer, ensuring consistency with defined software requirements.
- Led the scaling and verification of embedded control software developed in MATLAB Simulink for electric drive systems, utilizing Polyspace and MXAM.
- Led and structured four internships within the company, designing their content and framework to align with the company's objectives and ensuring hands-on practical learning experiences for interns.
- Led and managed an internal R&D project as Product Owner and multi-disciplinary engineer (system, hardware, and software) for a custom small-scale autonomous vehicle prototype, contributing to system architecture, technical implementation, and documentation.
- Fully designed and developed two custom STM32-based PCBs in KiCad for a small-scale autonomous vehicle: one for interfacing with a BLDC motor controller and inverter for rear-wheel drive, and the other for sensor integration and steering control via a DC motor controller. Scope included schematic design, component selection, PCB layout and routing, Gerber file generation, and managing communication and orders for manufacturing and assembly.
- Developed embedded firmware and software in C for the two custom STM32-based PCBs using the STM32Cube environment, HAL library, FreeRTOS, and Micro-ROS. Enabled real-time motor control

via on-board motor drivers and sensor data processing, leveraging multi-threading in FreeRTOS and utilizing communication protocols such as I^2C, UART, and SPI.
- Fully 3D modeled the custom autonomous vehicle in Blender, including 3D printing and the complete manual assembly of both mechanical and electrical components.

SoC Design Engineer (Remote, Part-Time) *July 2022 – September 2022*

***Chili Chips LLC**, California, USA*

- Contributed to the ongoing design and implementation of a custom RISC-V-based processor using SystemVerilog 2017, targeting the GOWIN platform on the Tang Nano 9K FPGA board for educational and embedded applications.
- Took part in the development of *eduBOS5*, the first Bosnian educational RISC-V processor, focusing on instruction set architecture and RTL-level design.
- Authored and documented technical content for an educational book on low-level processor design, covering HDL fundamentals, RTL design, and hardware development workflows.
- Assisted with early-stage simulation and verification of processor modules to validate pipeline behavior and instruction execution logic.
- Collaborated remotely with an international team, following best practices in code organization, documentation, and version control.

Teaching Assistant – Programming for Engineers (On-Site, Part-Time) *February 2022 – May 2022*

***International University of Sarajevo**, Sarajevo, Bosnia and Herzegovina*

- Led bi-weekly tutorial sessions for undergraduate students in C and C++, focusing on programming logic and foundational concepts.
- Assisted students in understanding low-level programming principles relevant to systems and embedded development.
- Created and explained code examples that emphasized structured programming, memory management, and algorithmic thinking.
- Provided one-on-one support to students during lab exercises, debugging sessions, and assignments.
- Collaborated with the course instructor to ensure alignment between lectures and tutorials, reinforcing key engineering problem-solving skills.

IT Intern (Remote, Part-Time) *February 2022 – March 2022*

***Energoinvest d.d.**, Sarajevo, Bosnia and Herzegovina*

- Gained practical experience with Agile methodologies, including Kanban and writing effective User Stories.
- Learned and applied version control using Git for collaborative software development and codebase management.
- Contributed to the development of a React-based web application for visualizing air quality data.
- Strengthened understanding of the interaction between frontend applications and embedded hardware systems.
- Enhanced skills in debugging and testing software modules for data consistency and performance.

Education

Master of Science in Electrical and Electronics Engineering *2022 – 2024*

***International University of Sarajevo**, Sarajevo, Bosnia and Herzegovina*
Graduated with high honors, GPA 3.80/4.00

- Master's thesis: "Sensor-less Control of Permanent Magnet Synchronous Motor (PMSM) as a Supplementary Safety Startegy in ASIL D Environment for Electric Vehicles" (July 2024).
- Authored a research paper on "Methods and Applications of Forest Aerial Image Segmentation", exploring AI-based approaches such as U-Net and R-CNN for processing satellite imagery in forestry applications (May 2023).
- Conducted an in-depth research and simulation project on "Variable Frequency and Variable Voltage Power Supply", covering power electronics topologies, circuit design, component value calculations, and Simulink based system-level simulations (January 2023).
- Authored a research paper titled "Predicting House Prices Using Advanced Regression Techniques" (December 2022), exploring real estate price prediction using models such as XGBoost, Random Forest, and Artificial Neural Networks (ANN).

Bachelor of Science in Electrical and Electronics Engineering *2018 – 2022*

Minor in Computer Sciences and Engineering

***International University of Sarajevo**, Sarajevo, Bosnia and Herzegovina*
Graduated with honors, GPA 3.68/4.00

- Graduation thesis: "Design and Implementation of an ASIL-D Software Architecture Based on High-Performance FPGA and 32-bit Microcontroller for Automotive Applications" (June 2022).
- Software engineering project: "Generation of PWM Signals Using VHDL to Drive an Electrohydraulic Proportional Valve" (2022).
- Designed and built a Bluetooth-controlled four-wheel line follower gripper robot using Arduino (2022).
- Created a project management plan for "Automated Study Gamified Application for Electrical and Electronics Engineering Department" (2021).
- Developed a recipe blog web application with full-stack implementation using MongoDB, Node.js, and EJS (2021).
- Machine learning project on "Effects of Life Factors on Studying" using Neural Networks and k-Nearest Neighbors (2020).
- Embedded systems project "Mini Gaming Room", featuring an LCD mini-game and an LED-based graphical audio/frequency equalizer (2020).
- Object-oriented programming project: "Snake Game" (2020).
- Published IEEE paper on "Slotted Heart-shaped 4.77 dB Microstrip Coupler" (2020).
- Developed a business plan for a pet-sitting company, "SAME L.L.C.".
- Seminar paper on "Technology and the Transformation of Work" (2018).

First Bosniak High School *2018 – 2022*

***First Bosniak Gymnasium**, Sarajevo, Bosnia and Herzegovina*
Graduated with honors, GPA 4.91/5.00

- Graduation thesis on "Mechanics of the Human Locomotor System" (2018)
- Published seminar paper on "Graphs of Trigonometric Functions" (2017)
- Achieved 6^{th} place in Regional Physics Competition and 21^{st} place in Federal Physics Competition (2017)