Ivonne Berenice Lemus Martínez | Embedded Software Engineer

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Embedded Software Engineer with over 5 years of experience in designing, developing, and executing complex **embedded software** projects. Proficient in **C** and **C++,** with proven expertise in applying **AUTOSAR** architecture across the **automotive** software development **lifecycle**. Skilled in **debugging** and testing embedded systems to identify and resolve issues efficiently. Experienced in real-time operating systems (**RTOS**) and low-level programming. Strong background in version control tools such as **Git** and **Plastic**, along with in-depth knowledge of communication protocols including **CAN**, **I²C**, **SPI**, and **UART**.

PROFESSIONALEXPERIENCE

Embedded Software Engineer - BorgWarner. 19-03-2024 – 09-06-2024

-Collaborated with a **global cross-functional team** to develop customized solutions that resolved customer needs.

-Integrated **pull request** code updates into the project's main branch using **version control tools** such as **Bitbucket**, **Git**, **GitHub**, Plastic, and SmartGit.

-Ensured the proper startup of the **bootloader** and application by utilizing **CANoe** and **CANalyzer**, verifying part numbers to confirm correct software deployment.

Embedded Software Engineer - CIDEC. 16 - 06 2021 - 04-12- 2023

-Achieved an 80% improvement in **C-language** software development efficiency by accurately defining **software requirements** in compliance with specified standards.

-Improved **Engine Control Unit** reliability by resolving over 10 code software **issues** using analysis and **debugging** tools such as **Ozone** and the **JTAG** interface to identify root causes.

-Designed and implemented a **C**-based software component within the **AUTOSAR** architecture to monitor the ECU circuit board temperature.

-Performed software **unit tests** with VectorCAST to verify the detailed software design, ensuring high-quality software delivery and full condition coverage of functions.

-Implemented software development following the **V-Model** in compliance with **ASPICE** standards, adhering to the regulated **automotive industry** requirements and ensuring full coverage of the Software Development **lifecycle**.

-Identified 10+ code vulnerabilities through static analysis using LDRA and TRICORE tools in Eclipse, reporting MISRA violations, **Secure C** issues, and quality warnings.

-Performed software **unit tests** with VectorCAST to **verify** the detailed software design, ensuring high-quality software delivery and full condition coverage of functions.

Project Engineer - CIDESI. 12-04-2019 -14-06-2021

-Developed software in **Embedded C** language for **ARM microcontrollers** to store data in external NAND flash memory, improving storage speed by 80% in a glider datalogger system.

-Developed embedded software in **C++** to create an interface for **robot** control, enabling abstraction and modularity through organized access to **microcontroller** peripherals.

-Maximized the efficiency of TMS570LS3137 **microcontroller** system up to 30%, by developing **embedded software** implementing **RTOS (Real Time Operating System)**, using **GIT** for program version control.
-Implemented **C++** software using Object-Oriented Programming (**OOP**) to control the speed and acceleration of Mexico City's railway driving system, enabling project flexibility and scalability.
-Implemented code to read data from digital sensors using **Python** and embedded **Linux**, optimizing **GPIO** (General Purpose Input/Output) usage by 50%.
-Developed low-level drivers in **C++** for **CAN** and **UART** communication protocols, supporting **debugging** and validation activities, including issue **troubleshooting**.
-Performing **software testing** on train tracks and troubleshooting during system start-up to verify correct implementation of the system update.
-Visited customer and internal locations to provide hands-on support to **systems engineers**, identify **hardware** requirements, and contribute to the digitalization of the existing railway driving system in Mexico City.

Graduate Studies- Instrumented equipment Department - CIDESI. 27-09-2017 – 15-12-2020

-Implemented **I²C** and **SPI** communication protocols on an embedded system using **C language** to transmit and store acquisition data from Hall sensors.
-Created an electronic **architecture** for signal acquisition of 80 Hall sensors implemented in **FPGA**, which allowed to get 400 µs in acquisition time and reduce by 70% the implementation costs.
-Assisted in prototyping a mechatronic device for gas pipeline inspection validating the Magnetic Flux Leakage (MFL) technique.

Internship - Instrumentation Equipment Department - CIDESI. 27- 04-2017 - 15-09-2017

B.S. in Mechatronics Engineering | 09 -02-2012 - 10-02-2017

National Technological Institute of Mexico | San Luis Potosí
-Developed **firmware** for Texas Instruments, Microchip, and ST **microcontrollers** with **Assembly** and **C languages.**

M.Sc. & T. Mechatronics | 07-09-2017 - 09-12-2019

CIDESI | Querétaro

-Developed and executed **embedded** software to test a **hardware architecture** for analog data acquisition.

SKILLS

Programing Languages: C++, C, Assembler & Python
DevOps: Git & Plastic
CPU architectures: FPGA (Artix-7), FPGA (Spartan 3E), TMS570LS3137, MSP430F2618, PIC4550, STL microcontroller.
Communication protocols: I2C, SPI, UART & CAN

COURSES

C++: UDEMY. 2024-09-10 - 2024-10-10
Android OS: UDEMY 2025 MAY
Vector tools: CIDEC. 2021-06-16 - 2021-09-27