Martín Ribelotta

Embedded Systems Engineer

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Professional Summary

Experienced Embedded Systems Engineer with 15+ years developing robust, efficient solutions for aerospace, industrial, and IoT markets. Blending deep firmware, hardware, and Linux experience, I deliver full-stack embedded solutions from schematics to cloud. Known for autonomy, fast prototyping, and solving complex hardware-software interactions. Passionate about quality, performance, and lifelong learning.

Key Domains

Aerospace	Firmware updaters, secure bootloaders, ProASIC3 and SAMV71 systems
Industrial IoT	LoRa gateways, smart farming, BLE positioning
Embedded Linux	Buildroot/Yocto systems, custom drivers, panel PCs
FPGA/HDL	Radar simulators, PCIe acquisition, FPGA-SoC designs

Selected Projects

2022–Present **Freelance Embedded Developer**, Remote

Highlights:

- Reduced update time by 80% with Ethernet bootloader on STM32H7
- Designed 16-port Ethernet hub and data acquisition boards (KiCad)
- Enabled BLE indoor positioning using ZephyrOS on nRF series
- Built secure UEFI firmware for Intel/Qualcomm platforms
- Integrated AWS Lambda + RDS backend for smart farming system
- Ported MicroPython to legacy Zephyr RTOS for remote control

2020–2022 **Embedded Systems Contractor**, *Emtech*

Highlights:

- Built Qt+QML Wayland compositor for industrial HMIs
- Implemented HTTPS stack for ZephyrOS-based devices
- Developed aerospace-grade bootloader (SAMV71)
- Designed laser comm firmware (CMake-based, FreeRTOS)
- Created HW-in-the-loop CI environment for firmware
- Developed remote FPGA programming tool for ProASIC3

2011–2019 **Embedded Systems Engineer**, *Emtech S.A.*, Bahía Blanca/Bariloche

Highlights:

- Developed LoRa gateway (Allwinner MPU + SX127x)
- Created IoT RTOS stack (Cortex-M4) with custom protocol
- Built PCIe acquisition interface using Virtex6
- Deployed remote subsystem on Zynq7000 SoC (FPGA + Linux)
- Ported LEON3 softcore (Spartan6), supporting RTEMS/Linux

2009–2011 **Embedded HW/SW Developer**, *EyCON S.A.*, Bahía Blanca

Highlights:

- Redesigned GPS tracker hardware and firmware
- Delivered RFID ticketing terminals for city buses
- Built QtWidgets kiosk app for transport terminals

Technical Skills

Programming

Expert	C/C++, Python, Java, VHDL, ASM (x86/ARM/RISC-V)
Advanced	JavaScript, Tcl, Bash, Awk, R, SPARC ASM
Intermediate	Rust, Verilog, C#, PHP, LaTeX

Frameworks & Tools

Expert	Qt (Widgets/QML), GTK+, Boost, STL, Linux kernel API
Advanced	Wayland, X11, GStreamer, V4L2, CMake, Make

EDA Tools

PCB	KiCad, Altium, OrCAD, Eagle
IDEs	QtCreator, Eclipse, Vim, VSCode, MATLAB, SciLab

Operating Systems

Linux Distros	Ubuntu, Debian, RedHat, SuSE, Slackware
Embedded	Buildroot, Yocto, OpenWRT, QNX, LFS
RTOS	FreeRTOS, RTEMS, Zephyr, VxWorks, eCos, ChibiOS, iTron, OSEK, RT-Thread

Soft Skills

Communication	Can explain complex concepts to non-technical stakeholders

Collaboration	Works closely with multidisciplinary teams: HW, SW, cloud
Autonomy	Self-managed freelance engineer for over 10 years
Problem Solving	Specialized in hardware-software interaction debugging

Languages

Spanish	Native	*Mother tongue*
English	Fluent (reading/writing), conversational speaking	*Self-taught*

Certifications (Selected)

2023	Embedded Linux using Yocto Project (Coursera)
2022	STM32CubeIDE and HAL Drivers (ST Academy)
2021	AWS IoT Core Essentials (AWS Training)

Talks and Courses

- **RT-Thread for IoT**: technical workshop (Spanish)
- **RISC-V on Microcontrollers** — SASE 2022 (link)
- **MicroPython on EDU-CIAA** — PyCON-AR 2016 (YouTube)
- **Software Licensing in Embedded Systems** — UTN 2015 (GitHub)
- **Linux Driver Development for Embedded** — SASE 2011 (link)

Personal Projects

- Consulting and design services portfolio
- Technical blog on embedded topics
- Remote SCADA GUI (QML)
- Raw TCP to MQTT bridge
- Embedded log system for minimal targets
- Bare-metal ELF loader
- Arduino-compatible Cortex-M7 board
- Industrial Cortex-M7 system design
- IDE for embedded development

Education

2004–2011	**Bachelor's in Electronic Engineering (incomplete)**, *UTN FRBB*, Bahía Blanca, Completed 4 out of 5 years