

# Martín Ribelotta

*Embedded Systems Engineer*

✉ [martinribelotta@gmail.com](mailto:martinribelotta@gmail.com)  
🌐 [github.com/martinribelotta](https://github.com/martinribelotta)  
in [martin-ribelotta](https://www.linkedin.com/in/martin-ribelotta)  
🌐 [martinribelotta.github.io](https://martinribelotta.github.io)

## 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

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## 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

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## 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

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## Languages

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

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## Certifications (Selected)

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

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## 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](#))

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## 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

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## Education

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