Tommaso Montedoro

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Biography

Embedded Systems Engineer (MSc) specializing in automotive-grade firmware, QEMU-based hardware simulation, and embedded security. Strong background in bare-metal and RTOS development, memory fault diagnosis, and TPM 2.0 architectures. Currently completing a Master's thesis in collaboration with Infineon Technologies.

Education

Politecnico di Torino, MSc in Computer Engineering – Embedded Systems — Sept 2023 – Present

- **Relevant Coursework:** Computer Architecture, Operating Systems for Embedded Systems, Electronics for Embedded Systems, Cybersecurity for Embedded Systems, Software Engineering.
- **Master's Thesis:** Fault diagnosis and data compression techniques for automotive embedded memories (RRAM).

Politecnico di Torino, BSc in Electronic and Telecommunication Engineering — Sept 2020 – Sept 2023

Work

Infineon Technologies – Firmware Engineer Intern, Munich (Germany) — October 2025 – March 2026

- Conducting a Master's thesis project on embedded systems in collaboration with Politecnico di Torino.
- Developed and validated full-resolution bitmap datasets and pixel-wise representations to train GAN-based super-resolution autoencoders for fault analysis.
- Implemented firmware development, low-level debugging, and data compression techniques for fault diagnosis on automotive RRAM devices (TC48x, TC45x).

Projects

Pacman Videogame on Landtiger Board — github.com/tommymonte

- Developed C firmware for the Pacman videogame on a Landtiger board, enabling communication among multiple onboard peripherals.

S32K358 Emulation on QEMU – LPUART, GPIO, and Memory Mapping — github.com/tommymonte

- Implemented LPUART and GPIO device models for the unsupported S32K358 MCU on QEMU, including custom MMIO mapping and bare-metal firmware development.

TPM 2.0 Simulation on QEMU – Command Processing and Cryptographic Module (Ongoing)

- Designed and implemented a TPM 2.0 device model on QEMU, focusing on command processing, secure storage, and asymmetric cryptographic key generation.

Firmware Developer, Team ISAAC – Politecnico di Torino, Turin (Italy) — March 2024 – October 2024

- Contributed to firmware development and communication protocol design for a thermal camera with integrated GUI, used in the team's robotic remote control system.

Technologies

Programming Languages: C, C++, Python, Bash
Hardware & Low-Level: ARM Assembly, MIPS Assembly, VHDL, SystemC
Embedded & RTOS: FreeRTOS, Bare-metal
Simulation & Tooling: QEMU, ModelSim, QuestaSim, Synopsys, Keil, STM32CubeIDE, NXP Design Studio
Operating Systems & Architectures: GNU/Linux, ARM Cortex-M, RISC-V

Certifications

IELTS 6.0 — May 2023
GNU/Linux Advanced Course and Open Technologies — May 2025

Extracurricular Activities

Swimming Instructor, Rari Nantes Torino — Sept 2021 – June 2025

- Delivered swimming training to children and adults, developing communication, leadership, and responsibility skills.
- Assisted students in debugging hardware and software issues during laboratory sessions.

Piano – Trained at Yamaha Music School "Intenzioni Sonore" **Water Polo** – Former competitive athlete