

Emanuele Aquilia

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GitHub • LinkedIn

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Experience

Policumbent — IT Division Leader

Sep 2025 – Present — Turin, Italy

- Lead a team of students in designing, implementing, and maintaining IT systems for prototype bikes.
- Collaborated with the Electronics Division to develop and test embedded systems and sensors.
- Assisted the Electronics Division Leader in planning, timelines, and budget optimization.
- Coordinated cross-functional communication and resolved technical issues efficiently.
- Implemented software tools for monitoring prototype performance.
- Organized meetings and workshops to introduce newcomers and present division progress.

Policumbent — IT Division Member

Mar 2025 – Present — Turin, Italy

- Developed firmware for onboard electronic systems of prototype bikes.
- Conducted comprehensive system testing for durability and stability.
- Supported Electronics Division during track days, troubleshooting technical issues.
- Collaborated on PCB design and development to gain hands-on hardware experience.

Projects

Rowhammer Emulator in QEMU — Developer

May 2025 – Oct 2025 — Turin, Italy

Academic Contact: Prof. Alessandro Savino, Doc. Nicola Scarano

- Developed a Rowhammer emulator integrated into QEMU to simulate attacks in virtualized environments.
- Implemented memory access patterns to trigger bit flips in DRAM modules.
- Implemented single-sided, double-sided, and PARA Rowhammer techniques.
- Conducted performance evaluations to measure effectiveness in real-world scenarios.
- Documented the emulator's architecture and usage for research purposes.

Education

Politecnico di Torino

MSc in Computer Engineering — Embedded Systems track

Expected March 2027 — Turin, Italy

DAUIN (Dipartimento di AUTomatica e INformatica)

Politecnico di Torino

BSc in Computer Engineering

July 2024 — Turin, Italy

DAUIN (Dipartimento di AUTomatica e INformatica)

Final Grade: 93 / 110

IIS Leonardo, Giarre

High School Diploma — Applied Sciences

July 2020 — Giarre, Catania, Italy

Final Grade: 96 / 100

Skills

Programming Languages

Intermediate (3+ years): Python  • Bash  • C 

Beginner (1+ years): VHDL • Assembly  • LaTeX

Familiar (0+ years): Verilog

Technologies & Tools

Git / GitHub • Linux / UNIX • Windows
Microcontroller programming & debugging

- Serial protocols (I2C, UART, SPI)
- CAN Bus • RTOS (FreeRTOS) • PCB Design • Altium Designer • PCB soldering
- QEMU • GDB • Wireshark • Oscilloscope
- multimeter • Logic Analyzer

Languages

Italian: Native 

English: Advanced (C2) 

Vertigo and Refuso Firmware — Developer

Mar 2025 – Present — Turin, Italy

- Developed the firmware for Vertigo and Refuso, two PCBs for data acquisition and motor control.
- Implemented communication protocols (I2C, UART, SPI) for sensor interfacing; Refuso sends gearbox data to the CAN bus.
- Implemented motor control algorithms on Vertigo based on Refuso data, enabling sequential gear shifting and sending the inserted gear to the CAN bus for analysis and display.
- Tested and debugged firmware to ensure reliability and performance in real-world conditions.
- Collaborated with hardware engineers to optimize firmware hardware integration.

Additional Passions and Skills

- Enthusiast of vintage computer systems; currently building a 65C02-based computer and developing a custom PCB to improve debugging and experimentation.
- Electronics hobbyist with experience in designing, assembling, and testing custom PCBs for personal and academic projects.
- Experienced in 3D printing workflows, including slicing, print parameter tuning, material selection, and choosing optimal print orientation for strength and surface quality; motivated to expand skills by learning CAD design for full end-to-end prototyping.
- Interest in hardware security and secure embedded system architectures.
- Chess player, mainly active in online bullet and blitz formats.
- Passionate about motorcycle riding for both commuting and leisure; enjoy performing routine maintenance to deepen mechanical knowledge.
- Committed to a healthy lifestyle through regular gym training and balanced nutrition.

Soft skills & Extracurriculars

Collegio Renato Einaudi

April 2021 – Present — Turin, Italy

Member of a MIUR-accredited merit-based student housing community. Participated in personalized academic and soft-skill programs, cultural and interdisciplinary workshops, student leadership activities, and sports events. Gained experience in teamwork, mentoring, and project organization.

Tutoring

Provided academic support to younger students in programming, mathematics, and physics, assisting with assignments, exam preparation, and practical exercises. Tutored in Python and C during high school and undergraduate studies, fostering understanding of fundamental concepts and problem-solving skills.

Coursework

Graduate (MSc)

Computer Architecture II
Cybersecurity for Embedded Systems
Synthesis and Optimization of Digital Systems
Microelectronic Systems
Software Engineering
Big Data: Architectures and Data Analytics
Data Science and Database Technologies

Undergraduate (BSc)

Electromagnetism and Circuit Theory
Applied Electronics
Electronic Systems, Technologies and Measurements
Object-Oriented Programming
Automatic Control
Signal Theory and Processing
Computer Networks
Computer Architecture I
Databases
Calculus I-II
Linear Algebra and Geometry
Mathematical Methods for Engineering
Operating Systems
Algorithms and Data Structures
Programming Techniques
Computer Science