Emanuele Aquilia

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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

- 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 (Department of Control and Computer Engineering)

Politecnico di Torino

BSc in Computer Engineering
July 2024 — Turin, Italy
DAUIN (Department of Control and Computer Engineering)
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

Languages

Italian: Native
English: Advanced (C2)

Additional Projects

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 Information

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