

Berk Ali Demir

Torino, Italy

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EDUCATION

Politecnico di Torino, Torino, Italy

B.Sc. Computer Engineering

120/180 Credits Achieved

TED University, Ankara, Turkey (Transferred to Italy)

B.Sc. Computer Engineering, Economics Minor

EXPERIENCE

Private Tutor, Torino, Italy

Spring 2025 – Present

Digital Electronics Design

- One-on-one sessions with peers and junior students on fundamental topics and practice problems.
- Taught junior peers fundamental topics such as **Assembly (x86)**, **Propagation Delay**, and basic circuit timing.
- Designed exercises and practice problems to reinforce **core ECE** knowledge.

TEDU-APP, Ankara, Turkey

Fall 2022 – Spring 2023

University Mobile App Development Team

- Developed the calendar module **TEDUApp Scheduler** as part of the university's mobile application.
- Improved usability for students and academic staff by integrating intuitive interfaces.
- **Java (Spring Framework)**.

SARJJET, Istanbul, Turkey

Summer 2022

Hardware Engineering Intern

- Gained hands-on experience with **Embedded Systems** and low-level hardware debugging.
- Developed **Embedded Firmware** for real-time control systems using **PIC16F1516 Microcontroller**.

ACADEMIC PROJECTS

Gate-Level Design of an 8-Bit Von Neumann CPU, Politecnico di Torino

Individual Project, Summer 2025

- **Designed and built an 8-bit CPU** from scratch based on the **Von Neumann architecture**.
- **Developed a custom Arithmetic Logic Unit (ALU)** supporting 8 distinct arithmetic and logical operations.
- **Implemented core components (registers, memory cells, control unit)** using fundamental logic gates.
- **Engineered the full datapath**, including an **8-bit data bus and address bus**, managing data flow with tri-state buffers.
- Designed a hardwired **Control Unit based** on a state machine to **fetch, decode, and execute** a **custom-defined Instruction Set Architecture (ISA)**.

SIMD Optimization Case Study, Politecnico di Torino

Faculty-assigned, Spring 2025

- Completed a technical **case study as part of a research group** selection process.
- Explored vector operations and matrix multiplication in **C++ using multithreading** (Pthreads) and **SIMD (AVX)**.
- Focused on **parallelism strategies, memory layout**, and **hybrid CPU performance** considerations.
- Project was discontinued due to external reasons unrelated to performance.
- **Final report available** upon request.

SKILLS

- Key Courses: Computer Architecture, Digital Electronics Design, Data Structures and Algorithms, Automatic Control (on going), Operating Systems (on going)
- **Interests: CPU Design, Pipeline, Parallel Programming**
- **Technical:** Computer Architecture, Digital Electronics, Verilog, VLSI Design, RTL Design, High Performance Computing (HPC)
- **Programming:** C (Embedded), C++, Proteus, LaTeX
- **Soft Skills:** Future Focused, Leadership, Teamwork

EXTRA-CURRICULAR ACTIVITIES

CYBERTEDU, Ankara, Turkey

Founding President

Fall 2022 – Fall 2023

- Founded the university's cyber security student community.
- Organized events and workshops, including **Capture the Flag (CTF)** challenges.
- Fostered collaboration among students interested in digital systems and security.

LANGUAGES

- **Turkish:** Native Speaker
- **English:** Professional Proficiency
- **Italian:** Limited Proficiency
- **French:** Limited Proficiency

REFERENCES

- **Paolo Stefano Croveti**

Full Professor at Department of Electronics, Politecnico di Torino

Email: stefano.croveti@polito.it

Torino, Italy

- **Nestor Nicolas Henriquez Sepulveda**

phD. Candidate at Department of Electronics, Politecnico di Torino

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- **Firat Akba**

Associative Professor at Department of Computer Engineering, TED University

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Ankara, Turkey

- **Fatih Okuyucu**

Senior Electric Electronics Engineer at Dekimo

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Delft, Netherlands