# Sasha Fratini

MSc Electronic Engineering Student – Politecnico di Torino
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## Profile

MSc Electronic Engineering student at Politecnico di Torino (Nano and Micro Electronics, graduating Dec 2026), targeting semiconductor process engineering and digital IC/MEMS design roles. Hands-on cleanroom exposure to CVD, PVD and photoresist deposition; coursework in VLSI, FPGA and MEMS design; 6-month thesis internship on embedded FMCW radar signal processing for automotive object detection at ART S.p.A.

## Experience

**Radar Signal Processing Intern (MSc Thesis)** – ART S.p.A., Perugia, Italy *Apr 2026 – Sep 2026*

- Developed an embedded radar signal-processing pipeline for automotive object detection on a Texas Instruments mmWave radar SoC.
- Implemented DBSCAN clustering of radar detections.
- Developed event-triggered tracking algorithm (Python).
- Designed FMCW waveform (chirp) parameters.
- Optimized the embedded implementation for power consumption.

**Electronics Lab Teaching Assistant** – DET, Politecnico di Torino (collaboration contract) *Sep 2025 – Feb 2026*

- Assisted with didactic cleanroom activities: thin-film deposition (CVD, PVD) and photoresist deposition.
- Supported BSc and MSc students in hands-on electronics laboratory sessions.
- Guided students in the use of bench instrumentation.

**EMC Teaching Assistant** – DET, Politecnico di Torino (collaboration contract) *Jan 2025 – Jun 2025*

- Supported BSc students in Electromagnetic Compatibility (EMC) exercise sessions.
- Assisted professors in running laboratory sessions on AM/FM modulation and interference, and on 50 Hz power-grid EMC interference.

## Education

**MSc in Electronic Engineering (LM-29)** – Politecnico di Torino *Oct 2024 – Dec 2026 (expected)*

- Specialization: Nano and Micro Electronics
- Thesis: radar-based object detection for automotive applications, in collaboration with ART S.p.A.

**BSc in Electronic Engineering (L-8)** – Politecnico di Torino *Oct 2021 – Jul 2024*

## Projects

**EcoBin – BLE Smart Waste-Bin Sensor** *2026*

- **Board:** PCB design in Cadence OrCAD; TI CC26xx BLE SoC, ultrasonic distance sensor.
- **Firmware (C):** ultra-low-power dual-core design (ARM core + Sensor Controller), UART emulation, deep-sleep power management.

**Photonic Optical Components – Thin-Film & Waveguide Design** (MATLAB) *2025*

- Multilayer anti-reflection coatings for GaAs solar cells; AM1.5-weighted optimization.
- Fabry-Pérot filters and DBR mirrors (transfer matrix method); RGB waveguide combiners.

**STM32 Embedded Labs** (C) *2024*

- Timers, PWM, input-capture frequency measurement, EXTI interrupts, ADC, USART.

## Skills

**Semiconductor processes:** process flow; cleanroom (CVD, PVD, photoresist deposition); thin-film optical coating design; TCAD (Synopsys Sentaurus)
**Digital design:** VHDL, FPGA design (Quartus Prime), ModelSim simulation, VLSI design, CPU architecture
**MEMS:** MEMS design, COMSOL Multiphysics
**Embedded:** STM32 (HAL, CubeMX), TI CC26xx BLE, TI mmWave radar SoC, low-power firmware
**Signal processing:** FMCW radar, DBSCAN clustering, object tracking
**Programming:** C, Python, MATLAB/Simulink, VHDL
**CAD:** Cadence OrCAD (PCB design), Cadence Presto, AutoCAD
**Languages:** Italian (native), English (B2 CEFR; language courses in New York 2019, Bournemouth 2018)