

# Ismail EL BATTABI

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Engineering Student in Microelectronics and Computer Engineering — École des Mines de Saint-Étienne

## Profile

Third-year engineering student at ISMIN, École des Mines de Saint-Étienne, seeking a 6-month final-year internship starting April 1st, 2025, in the field of microelectronics. Interested in digital and analog design (VHDL/Verilog, FPGA, IC design). Strong interest in the intersection of microelectronics, hardware security, and artificial intelligence.

## Technical Skills

**Electronics and Microelectronics** : Logic design (adders, ALUs), schematic design and simulation with Cadence Virtuoso (analog and digital), hierarchical IC design, layout design and surface optimization.

**Embedded Systems** : Design and programming of microcontroller-based systems, peripheral integration (sensors, communication modules, RFID/NFC), and real-time applications.

**Cybersecurity and Computing** : Basics in embedded systems security, cryptography, blockchain protocols.

**Programming** : C/C++, Python (NumPy, TensorFlow, PyTorch), VHDL/Verilog (FPGA synthesis and implementation), TypeScript, JavaScript, Node.js, HTML, CSS, Tailwind, SQL, Bash/Shell scripting, Matlab, LaTeX.

**Tools** : Cadence Virtuoso, Vivado, KiCad, ModelSim, Quartus, Git, Linux.

## Education

**Mines de Saint-Étienne – ISMIN**, Gardanne 2023 – Present

Master's degree in Microelectronics and Computer Science

*Ranked in the Top 10 French engineering schools (L'Étudiant, 2025).*

**Preparatory classes Robespierre**, Arras 2021 – 2023

Mathematics and Physics Bachelor's degree — MP track (Mathematics-Physics).

Specialization in mathematics, physics, and computer science.

## Professional Experience

**Engineering Intern – Auto Hall (Casablanca, Morocco)** Apr 2025 – Aug 2025

Project: optimization of vehicle orders for multiple brands (Ford, Mitsubishi, JEEP, Maserati...).

- Developed an AI-based algorithm for optimizing order dates and volumes.
- Achieved significant cost reduction: up to 4x less monthly delivery expenses.
- Results approved and adopted by Senior management with direct impact on supply strategy.

**Logistics Manager – Forum Entreprises ISMIN (FEI)** Feb 2024 - Feb 2025

- Coordinated logistics operations for the annual career fair of the École des Mines de Saint-Étienne (ISMIN).
- Supervised scheduling, supplier management, and resource allocation.
- Ensured smooth execution of the event, hosting dozens of companies and hundreds of students.

**Engineering Intern – CNRS (Marseille, France)** Jan 2024 – Feb 2024

Project “Photodetectors for an eco-friendly celestial compass”

*Institute of Movement Sciences (ISM) and Institute of Materials, Microelectronics and Nanosciences of Provence (IM2NP)*

- Development and characterization of ZnO-based UV-sensitive pellets.
- Contribution to a bio-inspired navigation system using polarized UV light, an alternative to GPS and magnetic compasses.

## Projects

- **ASCON Hardware Implementation** — Designed and implemented the lightweight cryptographic algorithm ASCON in SystemVerilog for FPGA deployment.(see GitHub repository)
- **ECG Acquisition and Display System** — Fabricated ECG electrodes and a BPM display matrix in a cleanroom environment. Developed the acquisition and processing system on an STM32 microcontroller, integrating analog front-end circuits, digital filtering, and a real-time heart rate display.
- **Advanced Analog Design** — Characterization of NMOS transistors and design of a common-source amplifier using Cadence Virtuoso. Simulated device behavior (iD-vDS, iD-vGS) and optimized amplifier gain and biasing.(see GitHub repository)
- **AES RTL Validation** — Hardware/Software co-simulation between a SystemVerilog testbench, a C++ DPI layer, and a Python reference model. To verify a hardware AES-128 ECB encryption core against a Python software reference through socket communication. (see GitHub repository)

## Languages

French: Native

English: Fluent (technical reading/writing, communication)