

ALEXANDRE KISS

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Master's student in Microengineering at EPFL, specialising in Micro/Nanosystems, currently visiting researcher at MIT

Multidisciplinary hardware engineer covering the development chain of a microsystem or a mechatronic device: device physics and cleanroom fabrication, FEM modelling, readout electronics, PCB design, embedded firmware and experimental characterisation. Specialised in nanoelectronic devices, MEMS and sensors, and in the instrumentation around them. **Available from September 2027.**

EDUCATION

Massachusetts Institute of Technology — Cambridge, MA

Sept 2026 – June 2027

Visiting graduate student, Department of Physics. Master's thesis in the Jarillo-Herrero group

École Polytechnique Fédérale de Lausanne (EPFL) — Lausanne, CH

expected July 2027

M. Sc. Microengineering, specialisation Micro/Nanosystems. GPA 5.3 / 6.0. B. Sc. Microengineering, EPFL, 2021–2024

EXPERIENCE

Visiting Researcher — MIT, Jarillo-Herrero Group

Sept 2026 – present

[2D Materials](#) | [RF Readout Electronics](#) | [Cleanroom Fabrication](#) | [Fast Measurement](#)

Master's thesis on 2D ferroelectric transistors for neuromorphic and low-power computing. Developing a GHz-bandwidth low-noise readout to resolve nanosecond polarization switching in real time, and fabricating the devices in the cleanroom.

Sensor Design Intern — Melexis, Innovation Team

Mar 2026 – Aug 2026

[Mechatronic Design](#) | [PCB Design](#) | [COMSOL FEM](#) | [Embedded Integration](#) | [Calibration](#)

Six-axis inductive force/torque sensor for robotics: sensing structure sized by parametric FEM optimisation under fatigue constraints, readout PCB, embedded acquisition and calibration bench. Prototype characterised at 0.36 %FS accuracy, 9.1-bit resolution and 0.13 % cross-axis coupling.

Research Intern — EPFL NanoLab, Cryogenic Ferroelectric Devices

Sept 2025 – Dec 2025

[Cleanroom Microfabrication \(CMi EPFL\)](#) | [Semiconductor Physics](#) | [Electrical Characterisation](#)

Process development for HfO₂ ferroelectric capacitors and MFIS transistors, from lithography and dry etching to thin-film deposition. Electrical characterisation of polarization switching, to evaluate the devices as memory and logic for cryogenic electronics.

Research Intern — EPFL LMISr, Olfactory Prosthesis

Feb 2025 – June 2025

[Circuit Design](#) | [FEM Simulation](#) | [Embedded C++](#) | [Experimental Validation](#)

Dual-channel electromagnetic actuation system for a sensory prosthesis: Class-D amplifier PCB, C++ PWM drive for independent stereo control, magnetostatic modelling of the coil and magnet, bench validation of actuator stability.

SKILLS

Sensors & instrumentation: sensor design and readout (inductive, capacitive, magnetic, optical), calibration, test benches and bench validation, design of experiments, measurement statistics.

Modelling & mechanical design: COMSOL Multiphysics and FEM, design optimisation, numerical methods, mechanism design, CATIA, Shapr3D, Onshape, precision machining, 3D printing.

Semiconductor & MEMS fabrication: cleanroom processing at EPFL CMi, photolithography, thin films and etching, MEMS and microsystem design, semiconductor device physics, 2D materials and nanoelectronics, electrical characterisation.

Electronics: analog and low-noise circuit design, analog VLSI fundamentals, signal processing and filtering, PCB design (KiCad, Altium), power and low-power electronics, LTspice.

Embedded & control: microcontroller firmware, motor control and PWM drives (DC, stepper, synchronous), closed-loop and discrete-time control, data acquisition, real-time measurement.

Software: C, C++, ASM, Python, MATLAB, Kotlin, Swift; machine learning, Arduino and ESP32, ROS2, Git, L^AT_EX.

SELECTED PROJECTS

Product Design & System Engineering — ECO-SENTINEL Wildlife Monitor

Sept 2024 – Dec 2024

[Low-Power Electronics](#) | [Embedded ML](#) | [CAD](#) | [Market & Stakeholder Analysis](#)

Autonomous bioacoustic monitor: ESP32 platform with an embedded bird-call classifier, LoRa uplink and GPS timestamping in a weather-sealed enclosure, field-tested, with a commercialisation study.

Xplore Student Association — Onyx 4.0 Mars Rover

Sept 2023 – Jan 2024

[Systems Engineering](#) | [PCB Design](#) | [Safety Architecture](#) | [Power Management](#)

IMU PCB and safety architecture for the European Rover Challenge: sensor communication migrated to CAN, protection circuits and emergency stop, tested with a multidisciplinary team under competition constraints.

Also: precision machining training; a compliant-mechanism force sensor in CATIA for robotic semiconductor inspection; closed-loop control of a swimming robot (Python) and of a delivery robot (C).

LEADERSHIP & ACTIVITIES

Model UN, Geneva (2020): chaired the Youth Assembly, leading 100 participants to a resolution on the gender digital divide. **TriviaPoly:**

Co-founder, first board member and head of judges; monthly quiz nights for up to 100 players. **Student coach:** first-year mentoring and a 150-person ski weekend. **Languages:** French (native), English (C1 Cambridge), German (B1 Goethe).