Clément Chalut

Microengineering Master Student

clement.chalut@epfl.ch | +33 6 74 71 17 67 | Lausanne, Switzerland
linkedin.com/in/clément-chalut | github.com/ccka | clementchalut.com

PROFILE

Second-year Microengineering Master student at EPFL (GPA: 5.43/6) specializing in Photonics and Semiconductors. Experience spanning sub-THz modulator characterization, RF IC design in 65 nm CMOS, autonomous drone systems, and lean manufacturing for medical devices. Led an entrepreneurial sports-tech project, managed production operations at a medical-device company, and fabricated swarm drones at EPFL's Laboratory of Intelligent Systems. Seeking an internship or master thesis opportunity. Native French speaker, fluent in English (C1); licensed pilot (PPL-A).

EDUCATION

EPFL – École Polytechnique Fédérale de Lausanne **2024 – 2026**
MSc in Microengineering — Specialization: Photonics & Semiconductors (in progress) *Lausanne, Switzerland*

GPA: **5.43 / 6.0** · 68 / 120 credits · Analog IC Design: 6.0/6 · RF Circuits Design Techniques: 6.0/6 · Products Design & Systems Engineering: 5.75/6 · Evolutionary Robotics: 5.75/6

EPFL – École Polytechnique Fédérale de Lausanne **2020 – 2024**
BSc in Microengineering *Lausanne, Switzerland*

GPA: **4.69 / 6.0** · 180 / 180 credits · Advanced Microfabrication Practicals: 6.0/6 · Mechanism Design II: 5.5/6 · Semiconductor Devices: 5.5/6 · Materials Processing I: 5.5/6

PROFESSIONAL EXPERIENCE

Stérilux *Ecublens, Switzerland*
Manufacturing Manager Feb 2026 – Present · *Part-time*
– Managing cross-functional team coordination and workshop logistics for medical-grade UV-C technology deployment.
– Scaling operational capacity to meet international market demands.
Operations Consultant 2025 · *Part-time*
– Optimized manufacturing workflows and reduced production lead time by implementing lean methodologies.
– Liaised between technical engineering teams and business strategy requirements.
Production Technician 2024 · *Part-time*
– Assembled and quality-controlled medical devices on the production line.
– Identified critical bottlenecks in the assembly process that informed later operational strategies.

Laboratory of Intelligent Systems (LIS), EPFL *Lausanne, Switzerland*
Drone Maker – Research Internship Summer 2025 · *Internship*
– Fabricated and calibrated a swarm of 20+ micro-drones for collective behavior research.
– Debugged flight controllers and performed hardware repairs to ensure 95% fleet availability.

EPFL *Lausanne, Switzerland*
Teaching Assistant – Electronics 2023 – 2025 · *Academic*
– Mentored 100+ students through circuit design, signal processing, and embedded systems fundamentals.
– Provided technical support for hardware debugging and PCB layout during lab sessions.

Uveya *Renens, Switzerland*
Freelance Mechanical Designer Summer 2021 · *Freelance*
– Designed the exterior casing for an autonomous UV-C disinfection robot (V3.2) for airplane cockpits.
– Used CATIA V5 for complex surface modeling and airflow optimization.

SELECTED PROJECTS

Sub-THz Wireless Modulators · Semester Project **Fall 2025**

EPFL HyLab
– Characterized 40 antenna-coupled TFLN/TFLT modulators across a 4×5 geometric matrix (0.5–2.0 mm length, 3–7 µm gap) for 6G applications.
– Measured peak β=0.177 rad at 100 GHz; TFLN outperforms TFLT in 87% of geometries (13–73% efficiency advantage). At 300 GHz, TFLN holds a 6.6 dB advantage.
– Built an automated Python measurement bench with Smart Peak Detection algorithm extracting sidebands to −70 dB noise floor; reduced measurement time by 80%.
– TFLT fabrication yield: 95% (19/20) vs. TFLN: 75% (15/20); TFLT exhibits 17–75% lower RF propagation losses.
Python · Anritsu MS9740A · VDI RF Multipliers · Keysight N7776C · TFLN · TFLT

915 MHz SDR Receiver · RF IC Designer **Fall 2025**

EPFL · EE-426 (2-person team)
– Designed a complete RX chain: Inductively Degenerated Cascode LNA (45.87 dB gain, 1.21 dB NF, 1.8 mW, S11=−10.5 dB), passive mixer, and Σ−Δ modulator.
– Implemented in 65 nm CMOS with cross-coupled OTA integrator, 1-bit Verilog-A quantizer/DAC, I/Q dual-path architecture at 300 MHz sampling.
– Achieved OOK and QPSK demodulation with OIP3=+21.3 dBm linearity across the 26 MHz ISM band.
65 nm CMOS · Cadence Virtuoso · Spectre RF · Verilog-A · Python

UHF Ground Segment · RF Systems Engineer — **Spring 2026**

EPFL Spacecraft Team · MICRO-499
– Building a complete Tx/Rx ground segment for CubeSat communication in LEO: RF hardware integration (PA, LNA, switches), GNU Radio modulation and telecommand framing, and REST API mission control.
– Evaluating antenna configurations, polarization trade-offs, and RF chain characterization (EIRP, G/T) for automated closed-loop communication.
GNU Radio · Python · UHF · SDR · RF Hardware · REST API

Durandal Fencing System · Product Engineer — **2024 – 2025**

EPFL · MICRO-301
– Developed a wireless, wearable referee system for fencing as an entrepreneurial project with a team of EPFL students.
– Engineered a low-latency (<10 ms) master-slave protocol using ESP-NOW with DSP-based hit detection (FFT/FIR, 500 g FIE-compliant threshold).
– Designed a custom PCB with ESP32-C3 and FreeRTOS firmware for real-time signal processing.
ESP-NOW · ESP32-C3 · FreeRTOS · KiCad · Node.js · WebSocket

The Guardian Angel · Systems Engineer — **Fall 2025**

EPFL · MICRO-406 (5-person team)
– Developed a privacy-preserving fall detection system for elderly: C1001 mmWave radar + MAX30102 PPG/MLX90614 temperature sensors + React web dashboard.
– Designed a hybrid Firebase architecture (RTDB for real-time vitals, Firestore for historical data) with RBAC and patient consent handshake.
– Set requirements of ≥95% fall detection accuracy and ≤5% false positive rate; prototype unit cost: 42 CHF (ceiling), 96 CHF (master station).
mmWave Radar · ESP32 · FreeRTOS · Firebase · Fusion 360 · React

Integrated Photonic Chip · Fabrication Engineer — **Spring 2024**

EPFL · MICRO-373 (3-person team)
– Fabricated an SOI chip with strip/slot waveguides, MZIs, and ring resonators at 1550 nm telecom wavelength.
– Achieved ring resonator Q-factors up to ~20,500 (Lorentzian fit) with near-critical coupling and thermo-optic MZI modulation.
– Executed full cleanroom cycle at EPFL CMi: E-beam lithography (Raith EBPG5000, 5 nm resolution), cryogenic silicon dry etching (228 nm depth), metal deposition for heaters.
SEM · AFM · KLayout · GenISys BEAMER · Cryo-Etching · Raith EBPG5000

Aerial Robotics Drone · Robotics Engineer — **Spring 2025**

EPFL · MICRO-502 (5-person team)
– Developed an autonomous flight stack on Crazyflie 2.X: state estimation, visual gate detection (Canny + contour analysis), and trajectory planning.
– Achieved 13.87 s best lap time (8.7× faster than baseline) using a two-run strategy: safe reconnaissance lap then performance laps.
– Implemented a minimum-jerk trajectory planner with Lighthouse positioning system and leading/trailing waypoints.
Python · CVXPY · Crazyflie · OpenCV · Webots

Music-Reactive Dancing Robot · Embedded Developer — **Fall 2025**

EPFL · MICRO-315 (2-person team)
– Programmed an e-puck2 robot in C to recognize piano notes in real-time via 1024-point FFT (16 kHz sampling, 15.6 Hz resolution) and translate them into directional commands.
– Implemented automatic BPM detection, adaptive audio thresholding, and IR-based obstacle avoidance with dynamic speed scaling.
– Built a multi-threaded ChibiOS architecture with priority-based scheduling and semaphore synchronization for concurrent audio, motor, and sensor tasks.
C · ARM Cortex-M4 · ChibiOS RTOS · FFT (CMSIS-DSP) · e-puck2 · IR Sensors

TECHNICAL SKILLS

Programming	C/C++, Python, MATLAB, Verilog-A, JavaScript/TypeScript, Node.js, React
EDA & Simulation	Cadence Virtuoso, Spectre RF, KiCad, GNU Radio, COMSOL
CAD & Manufacturing	CATIA V5, Fusion 360, KLayout, GenISys BEAMER, SolidWorks
Embedded Systems	ESP32, FreeRTOS, Arduino, Crazyflie, mmWave Radar, PCB Design
Production & Quality	Lean Manufacturing, Kanban, Value Stream Mapping, ERP, SPC, ISO 13485/9001
Software & DevOps	Git, Linux, Firebase, REST API, Docker (basics), LaTeX, Typst

INTERESTS & ACTIVITIES

Volunteer Firefighter · SDIS Vaud (2023 – 2026) — Responded to emergency calls requiring rapid triage, team coordination, and strict safety adherence.
Trumpet Teacher · Private Instruction (2022 – Present) — Taught trumpet to students across age groups, adapting pedagogy to individual learning profiles.
Licensed Pilot – PPL(A) — Holds a Private Pilot License; trained in aeronautical decision-making and high-workload cockpit management.

LANGUAGES

French: Native **English**: Fluent (C1) — *Available upon request.*