Raphael Fluckiger

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Born on 20.01.2000
Nationality: Swiss and Brazilian

EDUCATION

2024 - 2026 **Master in Cybersecurity** at EPFL and ETHZ

Some of the courses taken so far:

- Advanced Topics on **PET**s - Prof. Carmela Troncoso
- **Software Security** - Prof. Mathias Payer
- **TCP/IP** Networking - Prof. Pavlos Nikolopoulos
- Security of Wireless Networks - Srdjan Čapkun
- Network Machine Learning - Prof. Pascal Frossard
- **Semester Project**: Analysis of OFDM-Based Ranging against Early-Detect/Late-Commit (ED/LC) Attacks

2023 **Bachelor of Communication Systems** at EPFL

- **Signal Processing**
- **Principles of Digital Communication**
- **Stochastic models for Communications**
- Internet Analytics
- Data Intensive Systems

PROFESSIONAL EXPERIENCE

2016-25 **Private lessons:** Programming, Math, Physics, English

2019 **Web App Development at TAYO** at TAYO SA

Implemented service worker for offline PWA functionality

TECHNICAL SKILLS & LANGUAGES

Programming Languages

Languages	C/C++, ASM, Py, Java
Tools	PyTorch, Optuna, Matlab
Interests	Net, PETs, ML, Wireless

Languages

Native tongue	French, Portuguese
Proficient	English
Basics	Spanish, Italian, Deutsch

PROJECTS

2025 **Privacy-Preserving Location-Based Service** Advanced Topics on PETs

Situation: Developed a location-based application for finding nearby shops and restaurants while preserving user privacy.
Task: Implement privacy mechanisms to protect user location data without compromising service utility.
Action: Applied differential privacy using Laplace noise and obfuscation techniques to mask precise user locations while maintaining service functionality.
Result: Successfully increased privacy guarantees while preserving app utility; location accuracy decreased but remained sufficient for identifying relevant nearby venues.

2025 **Secure Multi-Party Computation Voting System** Advanced Topics on PETs

Situation: Designed a secure voting system for multi-party budget allocation (UN budget contribution scenario).
Task: Enable multiple parties to jointly compute voting results without revealing individual contributions.
Action: Implemented garbled circuits protocol allowing each country representative to input budget contributions privately.
Result: Achieved secure computation where aggregate results were computed without exposing individual country contributions, demonstrating practical MPC application.

2025 **Binary Exploitation CTF Competition** Software Security

Situation: Participated in Capture-The-Flag competition focused on binary exploitation techniques.
Task: Identify and exploit various memory corruption vulnerabilities in compiled binaries.
Action: Used Ghidra, pwntools, and GDB to analyze binaries and exploit buffer overflows, ROP chains, and format string vulnerabilities.
Result: Successfully solved 20 challenges increasing in difficulty, which gave me a good overview on binary exploitation techniques and methods.

2025 **Fuzzing Campaign on libXML** Software Security

Situation: Conducted security testing on libXML library to discover potential vulnerabilities.
Task: Improve code coverage and identify crashes or vulnerabilities through automated fuzzing.
Action: Deployed LibFuzzer and AFL to systematically test libXML; reproduced known CVE.
Result: Increased line coverage from 8% to 34%; discovered crash in deprecated code and successfully reproduced existing CVE for analysis.

2025 **GNSS Spoofing Attack Implementation** Security of Wireless Networks

Situation: Explored vulnerabilities in Global Navigation Satellite Systems (GNSS).
Task: Implement a GPS spoofing attack to manipulate location data.
Action: Used USRP software-defined radio with GNU Radio to reproduce and transmit GPS signals from North America while physically located in Zurich.
Result: Successfully demonstrated GNSS spoofing capability, highlighting critical vulnerabilities in location-based systems.

INTERESTS

Computers Born in 2000, I grew up alongside the internet, exploring computers from a young age. Lately I have been interested in Networking, TCP/IP related topics but also wireless stuff. Many aspects of Machine Learning security have caught my attention, such as Generative AI poisoning or membership inference.

Music I have been producing music since 2016 on Ableton Live and performing on bass and keyboard (Skuuted, Alba Marin). I also like to experiment with electronics and code to doodle around with filters. In general, anything linked to music, how we perceive air pressure waves, will inspire me.

Sports I mainly like sports where I can give my mind a break from everything else such as skateboarding, rock climbing and hiking in the alps.