François Michel

Software Engineer

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Date of birth : 16.07.1998
Swiss and French citizenships

I am a full stack software engineer with a Master of Science degree in Cybersecurity from ETH Zurich and EPFL. My expertise extends to the exciting realm of cryptography and zero-knowledge proofs, where I am deeply enthusiastic about leveraging these concepts to build secure systems. I have actively contributed to the development of a decentralized e-voting system, employing proof of personhood and designing cryptographic protocols.

Skills

Core Competencies	Software engineering, Cryptography, Algorithms, Decentralized systems, Computer security, Machine learning, Databases, Computer networking
Soft Skills	Problem solving, Teamwork, Leadership, Creativity
Programming languages	Java, Go, Python, JavaScript, TypeScript, Rust, Dart, Scala, PHP, HTML, CSS, SQL, Latex, Lua, Matlab, BASH
Frameworks	React, Angular, HTMX, Svelte, FastAPI, Spring, Quarkus, Flutter
Databases	PostgreSQL, Maria DB, MongoDB, Oracle Database
Development tools	Git, GitHub, GitLab, Bitbucket Visual Studio Code, IntelliJ Idea
Devops	Docker, Kubernetes, Helm, Jenkins, Github Actions, Ansible
Build toools	Maven, Gradle
Others	GraphQL, REST API, JSON-RPC, OAuth, CAS, OpenGL, OpenAPI, JSON Schema, XSD

Experience

Present – January 2023 — **Full Stack Software Engineer, ELCA Group, Lausanne Switzerland**

- Contribute to the development of secure softwares in the legal and medical fields, where data privacy is of utmost importance.
- Contribute to the development and performance optimization of the Unique Person Identification (UPI) system in Switzerland, which corresponds to the Social Security Number (SSN) system in the U.S., ensuring reliability and scalability.
- Designed, implemented and deployed a web-based application from scratch for a company in the medical field, currently used by thousands of doctors.

TDD | Agile | CI/CD | Backend | Frontend

September 2022 – February 2022 — **Research Engineer Intern, Secutix (ELCA Group), Lausanne Switzerland**

- Design and implementation of a highly secure and private physical access control system that utilized digital tickets. To ensure a high level of security and privacy, I leveraged modern cryptographic techniques, specifically zero knowledge proofs and pairing-based cryptography.
- The project was supervised by the cryptographer and professor Serge Vaudenay.

ZK-SNARKS | Paring-based cryptography | RFID | NFC | QRCodes

September 2021 – August 2021 — **Software Engineer Intern, Cyberbotics Ltd., Lausanne Switzerland**

- Creation of the model of the Rovable robot for Harvard and the MIT Space Exploration Initiative in a robot simulation software.
- Creation of a wildforest simulation where some drones acts as firefighters.

C | Python | JavaScript | Blender | GitHub

January 2019 – September 2018 — **Teaching Assistant, Swiss Federal Institute of Techology Lausanne (EPFL), Switzerland**

- Teaching Assistant for the Advanced Information Computation and Communication lecture.

September 2017 – July 2017 — **Summer Intern, Cyberbotics Ltd., Lausanne Switzerland**

- 3D modeling in Blender.
- Implementation of new features in a robot simulation software.

July 2021 – September 2015 | **Tutor in Math and Physics, Switzerland**
› Teaching math and physics to students aged 13 to 19.

Education

September 2022 – September 2020 | **Master Degree in Computer Science with Major in Cybersecurity**
ETH Zürich and Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland

June 2020 – September 2017 | **Bachelor Degree in Communication Systems**
Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland

June 2020 – September 2019 | **Exchange year in Computer Science**
University of Washington, Seattle, United States

Languages

English	●●●●●	Bilingual
French	●●●●●	Native
German	●●○○○	Elementary proficiency
Japanese	●○○○○	Elementary proficiency

Projets

Video Game Development — Present
Personal Project
github.com/flmichel/tank-game
Build an arcade-style tank multiplayer game in Rust where the game controller is a mobile phone connected to the game via WebRTC.
Rust | Typescript | WebRTC | Progressive Web Apps

Implementation of Blind Signatures for an E-Voting System — Fall 2023
Association DirectDemocracy
github.com/directdemocracy-vote/app
Implement RSA Blind Signatures (IETF RFC 9474) in JavaScript to ensure vote privacy in a decentralized e-voting protocol.
Javascript | Cryptography

Event Platform — Fall 2021
Course Project - EPFL - Grade : 6/6
github.com/flmichel/event-platform-gql
Designed and implemented a secure event management application using GraphQL Shield.
Typescript | GraphQL | Visual Studio Code

Anonymous Proof-of-Presence Groups for Messaging and Voting — Spring 2021
Semester Project - EPFL - Grade : 6/6
github.com/dedis/popstellar
Prototyped and implemented a highly robust proof-of-personhood group communication and voting app for mobile devices at the Decentralized Distributed Systems Laboratory with 9 other students. Managed the back-end team composed of 3 students during the project.
Go | TypeScript | Cryptography | GitHub Actions | JSON-RPC

Tweets Sentiment Analysis (NLP) — Fall 2020
Course Project - EPFL - Grade : 5.5/6
github.com/flmichel/sentiment-classification
Built a python Machine Learning classifier performing sentiment analysis on a set of tweets. Achieved 88.2% accuracy, using a pre-trained BERT model combined with multiple pre-processing techniques. Other models were evaluated such as SVM and MLP.
Python | Jupyter Notebook | NumPy | pandas | scikit-learn

Game Boy Emulator — Spring 2018
Course Project - EPFL - Grade : 5.75/6
github.com/flmichel/gameboj
Develept a Nintendo Game Boy emulator in Java, during the EPFL course “Practice of object-oriented programming”.
Java