FRANCESCO ALEXANDR COLOSIMO

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Geophysicist and seismologist specialising in real-time monitoring, machine learning, and risk assessment. Experienced in developing operational systems for earthquake early warning and structural monitoring, with a focus on translating complex physical models into scalable, data-driven solutions for real-world decision making.

EXPERIENCE

Seismologist, Swiss Seismological service Sep. 2025 – ongoing

- Designed and taught a Master's course on machine learning for Earth and planetary sciences
- Developed and maintained real-time seismic data processing workflows for earthquake monitoring, integrating machine learning to improve performance
- Designed and implemented web-based services and APIs to make simulation results public

Structural health monitoring intern, IRMOS AG Feb. 2025 – Aug. 2025

- Led field measurement campaigns for structural monitoring, including sensor deployment, data acquisition, and validation
- Analysed structural vibration time-series data using Python (PyOMA) to extract modal properties
- Developed automated data processing pipelines, improving efficiency and reproducibility

Graduate research assistant, Swiss Seismological service 2024 – Feb. 2025

- Developed machine learning models (GANs, diffusion) for synthetic seismic waveform generation
- Enabled scalable simulation of rare seismic events to address limited training data
- Optimised large-scale data processing workflows for improved computational efficiency

Seismologist, Geophysical Institute of the Czech Academy of Sciences 2023

- Contributed to the development of an Earthquake Early Warning (EEW) system for Nepal
- Integrated hardware and software for real-time seismic data acquisition and processing
- Collaborated with stakeholders to support system implementation and validation

Seismologist Intern - Grillo/OpenEEW system. 2021 – 2022

- Analysed seismic datasets to develop real-time earthquake detection and magnitude estimation
- Improved performance and reliability of low-cost seismic monitoring systems

EDUCATION

MSc Geophysics - **ETH in Zürich** | 2023 – 2025

BSc Geology - **Charles University in Prague** | 2019 – 2022.

LANGUAGES

Italian – native | Czech – native (Slovak professional proficiency) | English – C1

COMPUTATIONAL AND TECHNICAL SKILLS

Scientific Computing & Programming
Python (NumPy, Pandas, ObsPy, PyTorch, TensorFlow, scikit-learn), MATLAB, SQL

Data Analysis & Modelling
Time-series analysis, signal processing, numerical modelling, inversion methods, uncertainty analysis

Machine Learning
Supervised & unsupervised learning, generative models (DDPMs, GANs)

Engineering Applications
Seismic hazard analysis (OpenQuake), structural health monitoring (PyOMA), real-time monitoring systems

Tools & Visualisation
Excel (data analysis, automation), Power BI, Matplotlib, Seaborn, QGIS, ArcGIS Pro, Adobe Illustrator

ADDITIONAL EXPERIENCE & INITIATIVES

Scientific Outreach & Industry Collaboration — Prague, Czechia 2025 - ongoing

Organising scientific outreach and career networking events connecting students, academia and industry.

4EU+ Virtual Excursions Project — Sicily, Italy 2022

Developed virtual field excursions using drone-based data acquisition. Contributed to an interdisciplinary project combining geoscience, remote sensing, and education

ACHIEVEMENTS

Merit scholarship - Faculty of Sciences Charles university in Prague. 2021 - 2022

Best bachelor thesis, honorary award by the EAGE local chapter Prague. 2022