

FRANCESCO ALEXANDR COLOSIMO

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Profile

Geophysicist specialised in seismology, signal processing, and machine learning for real-time monitoring systems. Experienced in developing operational seismic workflows, applying advanced quantitative methods to time-series data, and translating research methods into robust scientific software for monitoring applications.

Education

MSc Geophysics

ETH Zurich
2023 – 2025

BSc Geology

Charles University in Prague
2019 – 2022

Employment History

Seismologist

Swiss Seismological Service

09/2025 – Ongoing

- Developed seismic processing workflows and machine learning integration for real-time earthquake detection and source characterisation.
- Applied quantitative time-series analysis and data-driven methods to operational seismic monitoring problems.
- Developed and maintained scientific software workflows for near-real-time seismic processing and analysis.
- Taught Master's-level courses in machine learning for Earth and Planetary Sciences.

Infrastructure Monitoring Intern

IRMOS AG

02/2025 – 08/2025

- Led field measurement campaigns for structural monitoring, including sensor deployment, acquisition, and quality control.
- Analysed vibration and time-series datasets using operational modal analysis and signal processing techniques.
- Developed automated and reproducible data-processing workflows for monitoring applications.

Research Assistant – Seismic Monitoring and Machine Learning

Swiss Seismological Service

2024 – 02/2025

- Applied generative machine learning models to seismic waveform synthesis and monitoring applications.
- Developed scalable workflows for large-scale simulation and analysis of seismic time-series data.
- Contributed to real-time earthquake early warning research and operational evaluation workflows.

Seismologist

Geophysical Institute [CAS]

2023

- Contributed to the development and testing of an operational Earthquake Early Warning (EEW) system for Nepal.
- Integrated hardware and software components for real-time seismic data acquisition and monitoring.
- Collaborated on validation and deployment workflows supporting operational seismic monitoring applications.

Seismologist Internship

Grillo/OpenEEW system

2021 – 2022

- Analysed seismic datasets for real-time earthquake detection and magnitude estimation.
- Improved reliability and performance of low-cost operational seismic monitoring systems.
- Worked with observational time-series data and near-real-time detection workflows.

Languages

Italian – Native — Czech – Native — English – C1

EXPERIENCE AND TRAINING

Geo-Engineering Research Accelerator

BGC Engineering Canada 06/2026 – 08/2026

- Selected participant in an international research program focused on applied geoscience and natural hazard modelling.

From Data to Hazards Modelling Hackathon & Earthquake Tsunami Cascades Workshop

GeoInquire Italy 2026

- Worked on integrated hazard modelling approaches, combining seismic and tsunami processes in a collaborative research environment.

COMPUTATIONAL & TECHNICAL SKILLS

Scientific Computing and Programming

Python, MATLAB, SQL
[NumPy, Pandas, ObsPy, PyTorch, TensorFlow, Scikit-Learn]

Scientific Software and Computing

Git, Linux, Docker, HPC environments, reproducible scientific workflows, automated data processing.

Data Analysis and 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 and Visualisation

QGIS, Matplotlib, Seaborn, ArcGIS Pro, Adobe Illustrator.

PUBLICATIONS AND CONFERENCE CONTRIBUTIONS

Institute for Rock Magnetism (IRM) – 2021

Fluctuation of the Dipolar Fields in the Brain and Control of Brain Functions (Kletetschka et al., 2021)

European Geosciences Union (EGU), Vienna, Austria – 2026

Poster: *Improving Real-Time Earthquake Source Characterization Using Diffusion Model Based Broadband Envelope Synthetics*.

<https://doi.org/10.5194/egusphere-egu26-20840>

[In Submission]

Colosimo, F. A., Jozinović, D., and Böse, M.: Improving Real-Time Earthquake Source Characterization Using Diffusion Model Based Broadband Envelope Synthetics

ACHIEVEMENTS

Best Bachelor Thesis 2022

Honorary award by the EAGE local chapter Prague.

Merit Scholarship 2021–2022

Faculty of Sciences Charles University in Prague.

SCIENTIFIC INITIATIVES

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.

Creating Effective Warnings for All Conference

UCL Warning Research Centre 2023
Participation in interdisciplinary conference focused on inclusive early warning system design and implementation.

Scientific Outreach & Industry Collaboration

Prague, Czechia 2025 – Present
Organising scientific outreach and career networking events connecting students, academia and industry.