

# Francesco Paissan

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## Experience

### Research Intern

MONTREAL INSTITUTE OF LEARNING ALGORITHMS (MILA)

Montreal

Sept. 2022 - Present

- Research and development on interpretability techniques for audio and speech models;
- Research on novel techniques for self-supervised learning in the EEG domain;
- **Derivables:** contributions to open-source toolkit SpeechBrain, 2 pre-print, 1 conference paper, 1 journal paper (under review).

### Research Fellow

E3DA UNIT - BRUNO KESSLER FOUNDATION

Trento, Italy

Oct. 2018 - Present

- Research in the fields of machine and deep learning for computational and energy constrained devices;
- Exploring novel techniques for the optimization of Deep Neural Networks for embedded devices;
- **Derivables:** 4 conference papers, 3 journal papers, 9 papers in international workshops, 1 pre-print.

### Scientific collaborator / Member

LEGEND EXPERIMENT - NATIONAL INSTITUTE FOR NUCLEAR PHYSICS

Rome, remotely

Jan. 2021 - Dec. 2023

- Firmware development for the controller card used for SiPM read-out in the liquid argon veto;
- Design of ML-based trigger logic for real-time rejection of muon-induced scintillation in 40Ar;
- **Derivables:** 1 journal paper, 1 conference paper, internal notes for collaborators, experiment's slow control.

### Software developer

ROMA TRE UNIVERSITY, CO-FUNDED BY ITALIAN SPACE AGENCY (ASI)

Partially remote

Jan. 2022 - Apr. 2022

- Development of data acquisition systems for a project of the Italian Space Agency (ASI).

## Education

### University of Trento

B.S. IN COMPUTER ENGINEERING

Trento

Sept. 2023 - Current

### International Summer School for Young Physicists (ISSYP)

PERIMETER INSTITUTE

Ontario, Canada

2018

## Representative publications

See scholar (link) for a complete list of accepted publications.

F. PAISSAN, M. RAVANELLI, C. SUBAKAN, "Listenable Maps for Audio Classifiers" 2024

F. PAISSAN, E. FARELLA, "tinyCLAP: Distilling Contrastive Language-Audio Pretrained Models" 2024

A. ANCILOTTO\*, F. PAISSAN\* E. FARELLA, "XiNet: Efficient Neural Networks for tinyML" 2023

F. PAISSAN\*, A. ANCILOTTO\*, E. FARELLA, "PhiNets: a scalable backbone for low-power AI at the edge" 2021

## Academic activities

2024 **Workshop**, Co-organizer of the Explainable AI for Speech and Audio workshop ICASSP

2024 **Lecture**, "Efficient neural network design and beyond" (part of the doctoral course) UniPD

2023 **Seminar**, "tinyML: Designing Efficient Neural Architectures and Scaling Strategies for Edge Computing" tinyML Foundation

2023 **Seminar**, "tinyML: neural networks design principles, scaling strategies and beyond" University of Padua

2023 **Tutorial**, "Hands-on tinyML for IoT, bringing intelligence to the edge" IEEE WFIoT

2022 **Seminar**, "Emerging opportunities of machine learning in physics" INFN Roma3

2022 **Task coordinator**, DCASE "Low-Complexity Acoustic Scene Classification" task

2018- **Reviewer**, journals and conferences in ML, bio-signal processing and embedded systems

## Skills

**Scientific computing** Python, Mathematica, MATLAB, R (beginner)

**AI/ML frameworks** PyTorch, TensorFlow, Keras, Scikit-learn, Speechbrain

**Programming** C/C++, (Embedded) C, MongoDB, Dart, Flutter, ROS, Git, GPIB protocol

**Embedded platforms** ARM Cortex series, Beaglebone, Raspberry Pi, ASUS Tinkerboard, Arduino