# FILIPPO CASTELLANI

MSc Student

Birth date: 5th Feb 1999


Portfolio Website
castellanifilippo5@gmail.com
+39 3482740303
github.com/FilippoCastellani
Paris, France
/in/filippo-castellani


## SUMMARY


Biomedical Engineering student driven by a profound interest in Neuroscience, Brain-Machine Interfaces (BMI), and AI-driven solutions for rehabilitation. I can rely on solid basis of engineering principles complemented by hand-on experience gained through direct interaction with patients and conducting experiments with technical instrumentation. I aim to contribute as much as possible to the field of biomedical solutions which can improve people well-being and ultimately change their life.


## SKILLS

**Languages:** Python, Matlab, C++, JavaScript, SQL, HTML, CSS.

**Abilities:** EEG, EMG recording, large-scale neuron population recording using multi-electrode array.

## EXPERIENCE

10/2023 – today **Research internship** — **Institut de La Vision (Sorbonne Université), Paris, FR**

- Research biological neural network behaviours through Retinal Ganglion Cells (RGC) response analysis, during 'natural' movies elicitatation.
- Assist multi-electrode array experiments on ex-vivo murine retinas.
- Analyse and model the electrophysiological response of retinal ganglion neurons, to uncover visual features extracted at this level of the visual pathway, focusing on recently discovered contrast encoding.

`Python, Jupyter Notebook / Linux/Unix System`

11/2021 – 09/2023 **Neurotechnology Researcher**

**RECOMMENCER Project:** ***Currently undergoing clinical trial*** — **S.Lucia Foundation IRCCS, Rome, IT**

- Brain Computer Interface (BCI) implementation. Corticomuscular Coherence-based BCI for rehabilitation of the upper limb on post-stroke subjects.
- Develop real-time computational core for BCI that performed EEG and EMG signal analysis.
- Create feature visualization and rehab session management UI.
- Design and integrate information processing modules in a cohesive data pipeline, from acquisition to sensorial neurofeedback.
- Write documentation and software version managing.

`Matlab, Python, Jupyter Notebook, XML / OpenVibe, Github`

## PUBLICATIONS

2022 **Cortico-Muscular Coupling to Control a Hybrid Brain-Computer Interface for Upper Limb Motor Rehabilitation: A Pseudo-Online Study on Stroke Patients.** **Front. Human Neuroscience 2022, 16, 1016862.**
de Seta, V.; Toppi, J.; Colamarino, E.; Molle, R.; Castellani, F.; Cincotti, F.; Mattia, D.; Pichiorri, F.

## PROJECTS

Up-to-Date **My projects** — **Portfolio**

Collection of recent, past and ongoing projects.

## EDUCATION

9/2021 - today
scholarship holder
**MSc Biomedical Engineering - Technologies for Electronics** — **Politecnico di Milano, Milan, IT**
Thesis: currently under development

9/2018 - 10/2021
scholarship holder
**BSc Clinical Engineering** — **Sapienza Università di Roma, Rome, IT**
Thesis: Coherence-Based BCI for Rehabilitation: Feature Extraction and Experimental Assessment

- Perform research on state of-the-art use of coherence-based BCI.
- Implementing via Python, a feature extraction algorithm executable within the OpenVibe Software framework.
- Conduct laboratory test of features extraction from non-pathological subjects.

9/2011 - 9/2019 **Jazz Drum [2011-2015] and Electronic Music [2018-2019]** — **Conservatory of Music Santa Cecilia, Rome, IT**

- Completed coursework in composition, music theory, practical application of signal theory to sound.
- Proficient in solfége, with expertise in piano and drum techniques, as well as orchestral performance

## LANGUAGES

**English**: B2 (Cambridge), **French**: C1 (Alliance Française), **Spanish**: B1 (Istituto Cervantes), **Italian**: native.