



## Thesis Project Form

**Title (tentative):** Development of algorithms for real-time seizure prediction

**Thesis advisor(s):** Chiappalone Michela, Farshad Moradi (Aarhus University, Denmark)

**E-mail:** michela.chiappalone@unige.it

**Address:** Via Opera Pia 13, 16145 Genova

**Phone:**

### Description

#### Motivation and application domain

The main goal of the thesis work consists of developing algorithm(s) based on the exploitation of Machine Learning tools (such as Spiking Neural Network -SNN) for predicting the presence of seizures in electrophysiological traces.

#### General objectives and main activities

The student will learn to design and optimize bioelectrical therapeutic solutions for health care, specifically consisting of a real-time interface between a computational device and a biological system. More specifically, the student will be involved in scientific and technical activities aimed at developing algorithms and then building software solutions for EEG signal analysis, specifically aimed at identifying aberrant electrophysiological patterns in the form of epileptic seizures. The algorithm(s) will be further implemented in a hardware-based SNN, to be used for implantable electroceutical solutions for epilepsy.

#### Training Objectives (technical/analytical tools, experimental methodologies)

The student will gain skills in developing algorithms for detecting epileptic patterns of activity. Moreover, the student will be trained to process and interpret neuronal data with appropriate tools and will learn the bases for designing and building a hardware-based SNN able to read and process in real time the incoming data.

**Place(s) where the thesis work will be carried out:** Aarhus University, Aarhus, Denmark

### Additional information

**Pre-requisite abilities/skills:** MATLAB programming skills, signal processing, statistics, attitude to computational work

**Maximum number of students:** 1

**Financial support/scholarship:** Erasmus grant