



Thesis Project Form

Title (tentative): Developing closed-loop electrical stimulation to investigate learning and memory mechanism in human derived neuronal network on MEA-HD

Thesis advisor(s): Martinoia Sergio, Lorenzo Muzzi

E-mail: Sergio.Martinoia@unige.it

Address:

Phone: (+39) 010 33 52980

Description

Motivation and application domain

Programming python/matlab/c++
Data acquisition, processing and analysis
Neuronal culture maintainance

General objectives and main activities

The aim of this thesis will be to develop a closed-loop stimulation on the 3Brain Ag Biocam DupleX recording system. The student will have an API available to be able to implement the closed loop stimulation on the recording system and will have to interface with the 3Brain company. The program must be able to stimulate freely from pairs of independent electrodes and with variable current stimuli. It must be able to recalibrate the stimulation parameters in real time based on the network responses obtained in real time, minimizing the latency between the computer and the recording system. Once implemented, the student will have to test the effect of different closed-circuit stimulations on ad hoc prepared biological samples.

Training Objectives (technical/analytical tools, experimental methodologies)

Programming python/matlab/c++
Data acquisition, processing and analysis
Neuronal culture maintainance

Place(s) where the thesis work will be carried out: Gaslini Hospital

Additional information

Maximum number of students: 1