Thesis Project Form

Title (tentative): Correlation transfer in cortical neurons: an in silico investigation on Blue Brain Project data set

Thesis advisor(s): Massobrio Paolo, Michele Giugliano

E-mail: Paolo.Massobrio@unige.it

Address: Via All'Opera Pia, 13 - 16145 Genova

Phone: (+39) 010353 - 2761

Description

Motivation and application domain

During cognition and behaviour, neurons of the neocortex display prominent correlation in both their subthreshold membrane potentials and output spike trains

General objectives and main activities

Despite an increasing amount of experimental evidence, exploring the extent of correlated activity, very little is known about how different types of cortical neurons transfer input correlations into output correlated spiking activity. In this thesis project proposal, we aim at implementing and exploring in silico the protocol introduced by de la Rocha et al. (Nature, 2007) and apply it systematically to a variety of morphologically reconstructed multi compartmental models, as released by the Blue Brain Project team.

Training Objectives (technical/analytical tools, experimental methodologies)

Use and development of high-level computational models (from Blue Brain project); data analysis. Learning program language for running simulations. Data processing.

Place(s) where the thesis work will be carried out: University of Antwerp (Belgium)

Additional information

Pre-requisite abilities/skills: Computational Neuroscience, Neuroengineering

Curriculum: Bioengineering

Maximum number of students: 1

Financial support/scholarship: Possibile supporto da parte di Erasmus+