



Final project proposal

Type	Master/Undergraduate	
Title	<i>Neuron Clusters</i>	
Supervisor	Lasko Basnarkov	
e-mail	lasko.basnarkov@finki.ukim.mk	
Department / Group		
Institute of Intelligent Systems		
Topic(s)		
Computational Neuroscience		
Project can start from	01.04.2014	
Project duration	4 months	
Short description		
<p>The project aims at developing models of neuron clusters. For the individual neurons will be used models from the literature like the Hodgkin-Huxley and FitzHugh-Nagumo models. Various networks of neurons will be built and their behavior will be studied and compared with those of real neuron clusters. This is theoretical work and analysis of the networks will be based on computer simulations. If more students enroll in this activity different issues can be addressed: determination of the minimal (simplest) single neuron model that is needed for some neuron cluster to produce certain behavior; complexity and robustness of the neuron networks under parameter variation and noise; reproducibility of some real world signaling pathway and so on.</p>		
Results and assessment		
<p>The student's target is developing computational model of neuron cluster and analysis of its behavior. Written report about the simulations results under different circumstances (parameter change, noise), their analysis and possible explanation is the indicator of full accomplishment of the student's role in this project.</p>		
Other (additional) information		
<p>The prospective student(s) can join the group that already started working on this topic. The group is part of the Laboratory for Complex Systems and Networks within the Macedonian Academy of Sciences and Arts.</p>		