Announcing the Final Examination of Amirhossein Jabalameli for the degree of Master of Science

Time & Location: June 22, 2015 at 1:00 PM in UCF NanoScience Technology Center, Research Pavili 475
Title: A Linear Approach to Identify a Multi-timescale Adaptive Threshold Model

As large-scale detailed network modeling projects are appearing in the computational neuroscience area, the essence of the single neuron model arises. In this work, we focus on the parameter estimation problem of a multi-timescale adaptive threshold neuronal model. Using the dynamics of a leaky integrator equipped with an adaptive threshold, we propose a method to fit the model to the reference data. Through manipulation of the system dynamics, the threshold voltage can be obtained as a realizable model that is linear in the unknown parameters. This linearly realizable model is then utilized inside a prediction error based framework to identify the threshold parameters with the purpose of predicting single neuron precise firing times. Simulation results demonstrate the ability of this approach to fit the multi-timescale adaptive threshold model to different types of reference data. This estimation scheme is evaluated using both synthetic data (obtained from the exact model), as well as experimental data.

Major: Electrical Engineering

Educational Career:
Bachelor's of Electrical Engineering, BS, 2013, Isfahan University of Technology

Committee in Charge:
Aman Behal, Chair, Electrical Engineering
James J. Hickman, Professor, Chemistry, Burnett College of Biomolecular Sciences, and Electrical Engineering, University of Central Florida
Michael Haralambous, Assistant Professor, Department of Electrical and Computer Engineering, University of Central Florida

Approved for distribution by Aman Behal, Committee Chair, on June 22, 2015.

The public is welcome to attend.