ELSC Seminar: Ron Meir

January 16, 2014

On the topic of: "The neuron's response at extended timescales: memory, noise and stability"

ELSC cordially invite you
to the lecture given by:

Ron Meir
Department of Electrical Engineering, Technion

On the topic of:

"The neuron's response at extended timescales: memory, noise and stability"

The lecture will be held on Thursday, January 16, 2014
at 17:00, at ELSC: Silverman Bldg., 3rd Wing, 6th Floor, Edmond J. Safra Campus

Light refreshments at 16:45

Abstract:

Many biological systems are modulated by unknown slow processes that are unknown or difficult to estimate. This can severely restrict analysis, especially in excitable neurons, which are highly nonlinear and stochastic systems. We show that the analysis simplifies considerably if the input stimulation matches the sparse spiking nature of the output. In this case, we derived the input-output relation of the neuron for a very general class of stochastic conductance-based models. The results lead to an explanation of the long term (1/f) temporal correlations recently observed in single neurons. Based on experimental data we make specific predictions on the ionic channel mechanisms underlying the temporal correlations. We show that although slow processes lead to temporal correlations on time-scales of days, the neuron's memory of the input decays on a timescale of minutes. We suggest experiments to test these predictions directly.
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