LABORATORY OF COMPUTATIONAL NEUROSCIENCE (LCN)

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Thursday, October 31st, 2013
13h30, Room SG 0213

Computational Neuroscience Seminar

Petr LANSKY,
Institute of Physiology,
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Variability of neuronal signal: from diffusion models to statistical methods

A single neuron exhibits different responses to repeated identical stimuli under identical conditions. Similar stochasticity also appears in firing patterns of neurons without experimentally controlled stimulation. Existence of this variability evokes questions and studies on stochastic features of neuronal activity are an active research area.

The aim of the talk is to point to our recent results on statistical methods applicable to neuronal spiking data. In contrast to experimental approaches we do not expect to explain the principles of neuronal coding but we wish to formalize the data description and to quantify what information can be deduced from them.

The mixed notion of signal and noise in neuronal models is discussed. Even the concept of mean firing frequency can be misleading and this is enhanced for more complex characteristics. Alternative measures of variability and randomness are compared and statistical treatment of quantities beyond frequency, either from serial or parallel data, is summarized.