

SFB-COLLOQUIUM

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Interplay of structure and dynamics through STDP: Does STDP enhance synchrony?

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Abstract:

There are some physiological evidences which suggest constructive role of spike synchronization in brain functions such as feature integration, attention, and associative learning. Study of synchronization bears importance for both understanding the brain functions and improving therapy of diseases such as epilepsy and Parkinson. The level of synchrony in neuronal networks is often controlled by the effective strength of interaction between individual components which themselves are modified by STDP rules, based on the relative timing of the spikes of the pre- and post-synaptic neurons. These interactive effects of synaptic strengths and spike timings determine a feedback loop between structure and dynamics which can show both stabilizing and destabilizing effects in different parameter regimes. In this seminar I review some recent studies on the effect of STDP on synchrony, and the effect of synchrony on the emergent structure of neuronal networks. Effect of delay in communication and STDP profile will be discussed and it will be shown that the results could also be affected by the type of the excitability of neurons.



Host: Sen Cheng (Mercator Research Group 1)

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