LABORATORY OF COMPUTATIONAL NEUROSCIENCE (LCN)

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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Thursday, December 4th, 2014
13h30, Room AAC 132

Computational Neuroscience Seminar

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Stochastic computation in spiking neural networks

We know from experience that spiking neural networks are remarkably efficient in solving complicated inference problems. Understanding these phenomena is not only interesting for brain science, but also for the development of novel, neuro-inspired computing architectures. In this seminar, we will review some recent approaches to spike-based probabilistic computation that have been developed within the framework of the BrainScaleS project. Starting from an abstract model of so-called neural sampling, we will show how ensembles of leaky integrate-and-fire neurons can provide a functional implementation of Boltzmann machines and Bayesian networks. These theoretical considerations will be complemented by a discussion of interesting applications of spike-based inference, with a particular focus on the challenges and advantages of their implementation on mixed-signal, accelerated neuromorphic hardware.