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Room: C3 - Main Auditorium

PLENARY SPEAKER

MODELING INTERACTING NETWORKS OF NEURONS AS PROCESSES WITH VARIABLE LENGTH

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ABSTRACT

A class of recently introduced models to describe networks of neurons as stochastic processes with memory of variable length will be presented. These are non-Markovian processes in high or infinite dimension in which the past dependence of transition probabilities or intensities has a range that is finite but depends on the particular history.

Starting from existence results, we study related mean-field models in continuous time and their large population limits, and discuss the relation with associated Piecewise Deterministic Markov Processes (PDMP's) and state results concerning their longtime behavior.

Finally, two important problems of statistical inference in such models will be considered : estimation of the spiking rate function and estimation of the neuronal interaction graph.

The talk is based on joint work with Susanne Ditlevsen, Aline Duarte, Antonio Galves and Guilherme Ost.