

Séminaire de Probabilités et Statistique

Mardi 8 février à 14h00

Salle Fizeau (5ème étage)

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Self-Switching Markov Chains: emerging dominance phenomena

In many dynamical systems in nature, the law of the dynamics changes along with the temporal evolution of the system. These changes are often associated with the occurrence of certain events. The timing of occurrence of these events depends, in turn, on the trajectory of the dynamical system itself, making the dynamics of the system and the timing of a change in the dynamics strongly coupled. Naturally, trajectories that take longer to satisfy the event will last longer. Therefore, we expect to observe more frequently the dominant dynamics, the ones that take longer to change in the long run. This article proposes a Markov chain model, called Self-Switching Markov Chain (SSMC), in which the emergence of dominant dynamics can be rigorously addressed. We present conditions and scaling in the SSMC under which we observe with probability one only the subset of dominant dynamics, and we characterize these dominant dynamics. Furthermore, we show that the switching between dynamics exhibits metastability-like property.

This is a joint work with S. Gallo, G. Iacobelli, and D. Takahashi.