Sparse space-time models: Concentration inequalities and Lasso

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Abstract:
Inspired by Kalikow-type decompositions, we introduce a new stochastic model describing a network of interacting neurons. For such class we establish oracle inequalities for Lasso methods and restricted eigenvalue properties for the associated Gram matrix with high probability. These results hold even if the network is only partially observed. The main argument rely on the fact that concentration inequalities can easily be derived whenever the transition probabilities of the underlying process admit a sparse space-time representation. This is a joint work with Patricia Reynaud-Bouret.