

CRUNCH Seminars at Brown, Division of Applied Mathematics

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**Learning networks of stochastic differential equations
(Literature Review)**

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We consider linear models for stochastic dynamics. To any such model can be associated a network (namely a directed graph) describing which degrees of freedom interact under the dynamics. We tackle the problem of learning such a network from observation of the system trajectory over a time interval T . We analyze the ℓ_1 -regularized least squares algorithm and, in the setting in which the underlying network is sparse; we prove performance guarantees that are uniform in the sampling rate as long as this is sufficiently high. This result substantiates the notion of a well-defined 'time complexity' for the network inference problem.