

Andrea Montanari: Information-theoretic bounds on learning network dynamics

How long should we observe the trajectory of a system before being able to characterize its underlying network dynamics? I will present a brief review of information-theoretic tools to establish lower bounds on the required length of observation. I will illustrate the use of these tools with a few examples: linear and nonlinear stochastic differential equations, dynamical Bayesian networks and so on. For each of these examples, I will discuss whether the ultimate information limit has been achieved by practical algorithms or not.