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Noise-induced relations between network connectivity and dynamics[1] EMILY SC CHING, The Chinese University of Hong Kong — Many biological systems of interest can be represented as networks of many nodes that are interacting with one another. Often these systems are subject to external influence or noise. One of the central issues is to understand the relation between dynamics and the interaction pattern of the system or the connectivity structure of the network. In particular, a challenging problem is to infer the network connectivity structure from the dynamics. In this talk, we show that for stochastic dynamical systems subjected to noise, the presence of noise gives rise to mathematical relations between the network connectivity structure and quantities that can be calculated using solely the time-series measurements of the dynamics of the nodes. We present these relations for both undirected networks with bidirectional coupling and directed networks with directional coupling and discuss how such relations can be utilized to infer the network connectivity structure of the systems.

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