Title:
Change Point Inference for Time-Varying Erdos-Renyi Graphs

Speaker:
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Time & Place:
Wednesday, Oct. 30, 2013, 4:00-5:00pm
Room 140 Bardeen
(Cookies & Coffee @ 3:30 in Rm 1210 MSC)

Abstract:
We investigate a model of an Erdos-Renyi graph, where the edges can be in a set of finite states (e.g. present/absent). The states of each edge evolve as a Markov chain independently of the other edges, and whose parameters exhibit a change-point behavior in time. We derive the maximum likelihood estimator for the change-point and characterize its distribution. Depending on a measure of the signal-to-noise ratio present in the data, different limiting regimes emerge. Nevertheless, a unifying adaptive scheme can be used in practice that covers all cases. Finally, for appropriate choices of the parameters of the Markov kernels, the limiting distribution of the change-point exhibits long-range dependence. The model is illustrated on synthetic, as well as US Senate roll call data.