Statistical network analysis typically deals with inference concerning various parameters of an observed network. In several applications, especially those from social sciences, behavioral information concerning groups of subjects are observed. Over the past century a number of descriptive statistics have been developed to infer network structure from such data. However, these measures lack a generating mechanism that links the inferred network structure to the observed groups. In this talk, we present a model-based approach called the hub model, which belongs to a family of Bernoulli mixture models. We further present theoretical results on model identifiability, a notoriously difficult problem in Bernoulli mixture models, and estimation consistency.

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