Department of Statistics

MASTER'S THESIS PRESENTATION

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Nonparametric Hypergraph Edge Partitioning

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ABSTRACT

Relational data can be modeled as graphs, and many popular probabilistic models for networks have been developed for purposes such as discovering latent structure in the graph. However, these models often assume that the graph has at most two vertices in an edge, whereas many data sources have complex relationships that are more naturally described by hypergraphs—graphs with edges that can contain any finite number of vertices. For such applications, the edges are often processed and projected down to 2-vertex edges. We consider a Bayesian nonparametric approach to modeling hypergraphs, in which the number of vertices are allowed to grow with the number of edges. Next we build upon this framework, proposing a class of infinite, latent hyperedge partitioning models, and we develop a general efficient inference algorithm for conjugate families. Using a beta-Bernoulli process, we demonstrate inference on synthetic data and results on an authorship network data set.

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