Statistics Seminar

Wednesday, December 2, 2015
4:15 pm
G01 Biotechnology

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A New Prior for Discrete DAG Models with a Restricted Set of Directions

In the present literature, prior distributions for discrete directed acyclic graph (DAG) models are either derived from the Dirichlet distribution on the complete model or consists of a set of different Dirichlet priors for each vertex of the DAG and each configuration of its parents.

In this talk, we develop a new family of conjugate prior distributions for the cell probability parameters of discrete graphical models Markov with respect to a set $\mathcal{P}$ of moral directed acyclic graphs with skeleton a given decomposable graph $G$. This family, which we call the $\mathcal{P}$-Dirichlet, is a generalization of the hyper Dirichlet: it keeps the directed $\mathcal{P}$-Dirichlet, is a generalization of the hyper Dirichlet: it keeps the directed strong hyper Markov property of the hyper Dirichlet for every DAG in $\mathcal{P}$ but increases the flexibility in the choice of its parameters, i.e. the hyper parameters.

We also give a characterization of this $\mathcal{P}$-Dirichlet which yields, as corollaries, a characterization of the hyper Dirichlet and a characterization of the Dirichlet.

Refreshments will be served after the seminar in 1181 Comstock Hall.