

1077-AA-2366 **Jason Morton*** (morton@math.psu.edu), Department of Mathematics, McAllister Building, The Pennsylvania State University, University Park, PA 16802. *Graphical models and monoidal categories*. Preliminary report.

Probabilistic undirected factor graph models generalize graphical models by replacing the clique complex associated to a graph with an arbitrary simplicial complex. The algebraic version focuses on the Zariski closure of the space of probability distributions modeled. Monoidal categories are a categorical formalism with associated graphical languages which are useful in representation theory, quantum information and foundations, and topological quantum field theory. I will describe work in progress on how the notion of discrete undirected and directed probabilistic (and algebraic) factor graph models can be understood in terms of a coherent graphical language for a certain type of monoidal category with additional structure. (Received September 22, 2011)