



THE UNIVERSITY OF
CHICAGO

Department of Statistics
DISSERTATION PROPOSAL

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Pairwise Density Estimation

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110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

We consider high-dimensional estimation of pairwise continuous densities by the method of maximum likelihood for exponential series. We derive risk bounds (in relative entropy) for approximating families of log-densities. Connections to undirected graphical models are explored, including risk bounds for graph structure regularization. A scalable, parallelizable variational algorithm using reweighted tree entropies is provided, and we show how it may be used to form a valid density which can be computed exactly using mixtures of trees. Finally, we discuss connections to conditional inference and density-based clustering.

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