

OPTIMIZING INEQUALITY CONSTRAINED PRIORS IN BAYESIAN NETWORKS

Dawn E.Holmes

Department of Statistics and Applied Probability, South Hall,
University of California, Santa Barbara, CA 93106, USA

Abstract

Intelligent systems based on Bayesian networks have been successful in medical diagnosis, finance and many other areas. Updating probabilities in Bayesian networks relies on algorithms that require complete causal information. Sensitivity analysis now strongly indicates that probabilities in Bayesian networks are not robust and this reinforces the view that a sound theoretical model for finding a minimally prejudiced estimate of the prior distribution is desirable. In this paper we are concerned with how to find the optimum prior distribution, given all and only the knowledge available. In particular, we show how to integrate prior knowledge expressed in terms of inequality constraints, into a Bayesian network based intelligent system.

Key Words: Bayesian networks, Maximum entropy, d-separation.

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