

國立高雄大學統計學研究所  
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姓名：翁建中

題目：Bayesian Variable Selection with Related Predictors

作者：Hugh Chipman

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摘要：

In data sets with many predictors, algorithms for identifying a good subset of predictors are often used. Most such algorithms do not account for any relationships between predictors. For example, stepwise regression might select a model containing an interaction AB but neither main effect A or B. This paper develops mathematical representations of this and other relations between predictors, which may then be incorporated in a model selection procedure. A Bayesian approach that goes beyond the standard independence prior for variable selection is adopted, and preference for certain models is interpreted as prior information. Priors relevant to arbitrary interactions and polynomials, dummy variables for categorical factors, competing predictors, and restrictions on the size of the models are developed. Since the relations developed are for priors, they may be incorporated in any Bayesian variable selection algorithm for any type of linear model. The application of the methods here is illustrated via the Stochastic Search Variable Selection algorithm of George and McCulloch (1993), which is modified to utilize the new priors. The performance of the approach is illustrated with two constructed examples and a computer performance dataset.

指導教授簽名：