

國立高雄大學統計學研究所  
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姓名：蔡雨潔

題目：Sparse Linear Regression in Unions of Bases via Bayesian Variable Selection

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摘要：

In this letter, we propose an approach for sparse linear regression in unions of bases inspired by Bayesian variable selection. Conditionally upon an indicator variable that is 0 or 1, one expansion coefficient of the signal corresponding to one atom of the dictionary is either set to zero or given a Student prior. A Gibbs sampler (a standard Markov chain Monte Carlo technique) is used to sample from the posterior distribution of the indicator variables, the expansion coefficients (corresponding to nonzero indicator variables), the hyperparameters of the Student  $t$  priors, and the variance of the residual signal. The structure of the dictionary, assumed to be a union of bases, allows for alternate sampling of the indicator variables and the expansion coefficients from each basis and avoids any large matrix inversion. Our method is applied to the denoising problem of a piano sequence, using a dual-resolution union of two modified discrete cosine transform bases.

指導教授簽名：