



A NORMAL MIXTURE INVERSE GAMMA APPROACH TO SPARSE FACTOR ANALYSIS

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Exploratory Factor analysis (EFA) is a multivariate statistical technique used to describe several observed variables as linear combinations of latent factors. Despite its usefulness, EFA is one of the most controversial methods. This is due to several types of indeterminacy of the EFA model. A way to overcome these issues is to impose a sparse structure on the factor loading matrix. From a Bayesian perspective, an early approach is to apply spike and slab priors: mixtures of a continuous distribution that allows for non-zero entries and a delta-spike at 0, which drives the factor loadings to 0. In this paper we propose a sparse versions of the Bayesian EFA in which the sparseness is induced by a bimodal mixture of two inverse Gamma distributions. This presents several computational advantages and facilitates the setting of the hyperparameters. Through a simulation study we show that the proposed method is able to correctly infer the underlying sparse structure and to retrieve interpretable solutions.

Keywords: variable selection; spike and slab priors; mixture models, sparseness inducing priors