Mean field variational Bayes for finite mixture of random coefficients models*

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For more than three decades, models with random coefficients have been widely used, especially for panel data. The estimation of a categorial random coefficient model can be considered as a special case of the estimation of a finite mixture of normal regressions. Finite mixtures regression models are powerful to explore the relationship between a response variable and a set of explanatory variables from latent homogeneous categories (or groups) of individuals. However, Bayesian analysis of finite mixtures regression models may lead to the "label switching" problem if the categories are not clearly defined or unless strong prior information is used. Unlike Monte Carlo-based approaches, the variational Bayes method does not suffer from the label switching problem when fitting mixture models. Variational Bayes methods for inference about mixture models have appeared in the machine learning literature over recent years.

We propose first a Markov Chain Monte Carlo (MCMC) for finite mixture of random coefficients models for an unbalanced panel dataset. This approach is followed by a mean field variational Bayes (MFVB) approximate inference for finite mixture of random coefficients models, which greatly reduces the computation time compared to the MCMC approach. The finite sample performance of the proposed MCMC and MFVB for finite mixture of random coefficients models have been investigated using extensive Monte Carlo experiments.

Biography:
Anoop Chaturvedi superannuated as a Professor from the Department of Statistics, University of Allahabad. He is a fellow of the royal statistical society and associated with several other academic societies. His recent research interests include Shrinkage estimation in Linear Models, Dynamic Models, Panel Data Models, Spatial Autoregressive (SAR) Models, data mining, Time series modeling and forecasting, Bayesian Unit Root Tests, and Control Charts for autocorrelated data.

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