



SEMINAR

An introduction to Bayesian Mixture Models

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Several times, sets of independent and identically distributed observations cannot be described by a single distribution, but a combination of a small number of distributions belonging to the same parametric family is needed. This representation is obtained by allocating the observations to different subsets through a latent variable. All distributions are associated with a vector of probabilities which allows obtaining a finite mixture of the different distributions. The basic concepts for dealing with Bayesian inference in mixture models, i.e. parameter estimation, model choice, and variable selection will be presented. Inference will be performed numerically, by using Markov chain Monte Carlo methods. Models related to mixtures will be also introduced: hidden Markov models, Markov switching autoregressive models, and spatial hidden Markov models. All these models can be analysed as dynamic mixture models, whose latent variables are defined either as a temporal or a spatial process. As an introductory reading:

- Frühwirth-Schnatter S (2006). Finite Mixture and Markov Switching Models. Springer, New York.
- Zucchini W, MacDonald IA, Langrock R (2016) Hidden Markov models for time series: an introduction using R, 2nd edn. Chapman & Hall/CRC Press, Boca Raton.