Mixture estimation - descriptive components

The descriptive components have the form

$$f_j\left(x_t|\Theta_j\right)$$

where j is the component number, and Θ_j is the parameter of the j-th component. The distribution of components can be arbitrary from those we mentioned in Section 1 concerning single models and their estimation. Here, for each model form also the statistics and their update as well as the construction of parameter point estimate can be found.

Regression scalar components

This program introduces mixture estimation with scalar normal components of the descriptive type. This is the most frequently used mixture model. It describes continuous multimodal data generated by a system that works in a finite number of distinct working regimes, such as in traffic problems they are traffic in the morning, noon, afternoon, evening and night. However, these working regimes do not need to be evoked only by time period but also by other causes as a traffic accident, work in a road, sport event or a demonstration. Here, the actual type of the traffic regime is not directly known and it has to be estimated.

Program and its description

Back to Main

Regression multivariate components

This program builds on the previous one with the difference that it describes multivariate data. The components are of the form

$$\begin{bmatrix} x_{1;t} \\ x_{2t} \end{bmatrix} = \begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix} + \begin{bmatrix} e_{1;t} \\ e_{2;t} \end{bmatrix}$$

with normally distributed noise e_t.

This example provides some details on the estimation of normal models. They concern computation of proximity, setting the initial information generation of output prediction and others. See the program and its description.

Program and its description

Back to Main

Exponential components

The components describe continuous non-negative data which most often take values close to zero.

Program and its description

Back to Main

Rayleigh components

The components describe continuous non-negative data for which, however, the maximal frequency of their values is estimated.

Program and its description

Back to Main

Discrete categorical components

Components for general description of discrete data. The model suffers form overparametrization and extremely high dimension.

Program and its description

Back to Main

Modified binomial components

A suitable form of description variables with finite number of different values. The shape of the component pf is suitable for description multinomial data with a mixture of components.

Program and its description

Back to Main

Poisson components

Model for discrete data with countably many different values. The tasks similar to those of the queue-theory or theory of reliability can be modeled this way.

Program and its description

Back to Main

State-space components

This mixture can model tasks of state estimation with model that switches among a finite set of state-space models.

Program and its description

Back to Main