



## Data Mining Methods in Psychiatry

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Nowadays, the number of subjects and variables are increased in scientific researches and so we have to work with large data sets. These data sets define the real biological structure better.

As known, univariate statistical models have strong assumptions such as normality and homogeneity of variance. When the assumptions are valid, univariate models have powerful results. Variables having certain properties evaluate by univariate model. Univariate models are made incorrect prediction generally, because these models not include the relationships between variables. Because many different type of variables are present in the large data sets, assumptions of univariate models are not valid generally. To overcome these problems, especially in the last 10 years, data mining methods are very effective and are presented as methods that define better the biological structure. Univariate analysis are used for preliminary evaluation in large data sets.

Data mining is a general name used for advanced statistical models. Many algorithms written by computer programs are available for these models. These algorithms can be found within commonly used statistical package programs. The most commonly used data mining methods based on the purpose are given in the [figure 1](#). The application of these methods in the present technology can be performed easily.

Researchers in the field of psychology or psychiatry work with large data sets, and these data are generally obtained by means of questionnaires or scales. Data mining methods in medical research can be used for purposes below [1]

- Diagnosis of disease
- Estimating of mood, emotion and behavior scores of patients
- Clustering of diseases [2]

Some examples about the use of data mining methods in psychiatry are given below.

- To assess the nature of the schizophrenia by Bayesian modeling
- To evaluate efficacy of drugs. This process is very important and complex task. Knowing all the mechanisms of therapeutic agents is a basic optimization problems.
- To determine the general profile of the people who have attempted suicide or who have the killer by cluster analysis

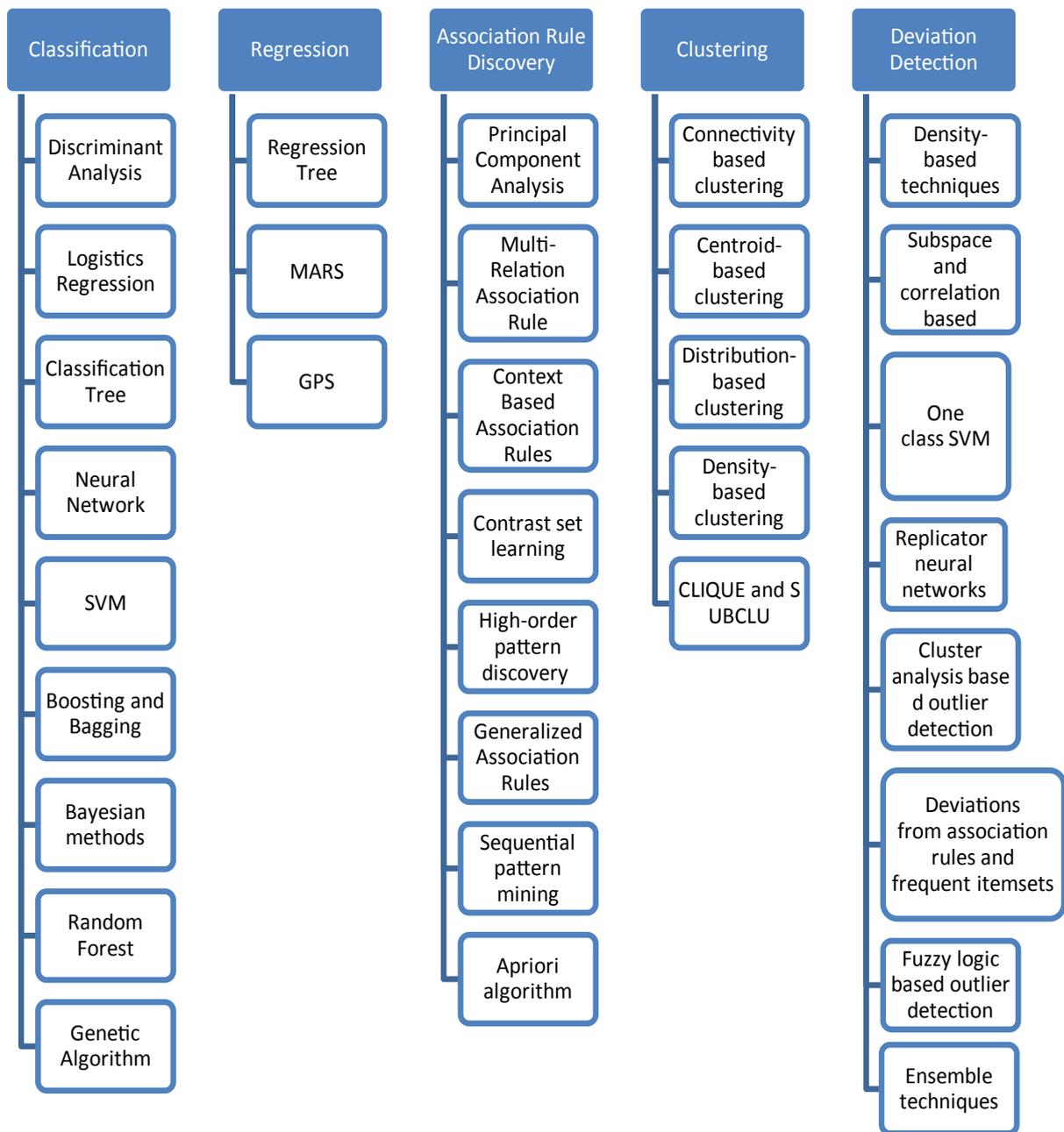
- To classify psychiatric diseases such as schizophrenia or Alzheimer disease by CART, SVM, Neural Networks or Bayesian method.

- To predict scores of Emotion, moods and behavior by Regression Tree or MARS

In conclusion data mining methods have more advantages, so they are recommended to use instead of univariate models in data analysis.

### Reference

1. Bartsch H, Thompson WK, Jernigan TL, Dale AM (2014) A web-portal for interactive data exploration, visualization, and hypothesis testing. *Front Neuroinform.* 8: 25.
2. Valero S, Daigre C, Rodríguez-Cintas L, Barral C, Gomà-I-Freixanet M, (2014) Neuroticism and impulsivity: their hierarchical organization in the personality characterization of drug-dependent patients from a decision tree learning perspective. *Compr Psychiatry* 55: 1227-1233.



**Figure 1:** Some Data Mining Methods Based on the Purpose