

The fuzzy approach to multivariate statistical analysis: recent developments

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Abstract

The basic ingredients of a statistical analysis are Data and Models. Both share an “informational” nature, clearly seizable in the knowledge discovery process leading to the acquisition of an “information gain”. These informational objects are often *imprecise* or *vaguely* defined. Fuzzy logic may account for this imprecision, providing us with a means for dealing with *fuzzy* informational objects in statistical analysis. Early contributions to this field refer mainly to cluster analysis (Bezdek, 1981) and regression (Tanaka, 1982). New developments have been taking place more recently, in the framework of a more systematic approach as a background for fuzzy statistical methods (see, e.g., Ruspini et al., 1998). In this framework, new techniques of analysis have been suggested, extending the domain of *fuzzy* multivariate analysis to principal component analysis (Giordani, Kiers, 2003), multidimensional scaling (Masson, Dencœux, 2002), cluster analysis for three-way data (Coppi, D’Urso, 2003). Also, the traditional field of fuzzy regression has been investigated more thoroughly giving rise to new methods (e.g. Coppi, D’Urso, 2003; D’Urso, Giordani, 2003). The paper gives an outline of these developments within an organic framework acting as the basis for a general fuzzy approach to multivariate statistical analysis.

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