

A simple method of cluster analysis using self-organizing map

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Regionalization is an important technique that uses existing information to extrapolate where the information is required but cannot be obtained. Cluster analysis is one of the important procedures of regionalization. In this paper, a simple method based on self-organizing map is proposed to perform cluster analysis for three advantages. These advantages are that the proposed method can detect the existence of the grouping, determine the proper number of clusters and reveal the relative relationship of the input patterns in an easy way. Experimental 2-D data is first analyzed using the proposed method. Then the design hyetographs of northern Taiwan are analyzed using the proposed method. The clustering results of the design hyetographs of northern Taiwan using the proposed method exhibit more homogeneity within clusters and dissimilarity between clusters than it using conventional methods. Regarding the capability of determining the proper number of clusters, the proposed method is superior to K-means in which the number of clusters should be determined in advance. Thus the proposed method can be applied to regionalization as a good clustering technique to obtain better results in an easy way.

Keywords: self-organizing map, cluster analysis, discrimination analysis, neural network, design hyetograph.