Automatic fuzzy genetic algorithm in clustering for images based on the extracted intervals

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Abstract

This research proposes the method to extract the characteristics of images to become the intervals. These intervals are used to build the automatic fuzzy genetic algorithm for images (AFGI). In the proposed model, the overlap measure is the criterion to evaluate the closeness of intervals, and the new Davies and Bouldin index is the objective function. The AFGI can determine the proper number of clusters, the images in each cluster, and the probability to belong to clusters of images at the same time. The experiments with different types of images illustrate the steps of AFGI, and show its significant benefit in comparing to other algorithms.

1 Introduction

In the information age, the problem of storage, extraction and recognition data are one of the big challenges to the scientists. For this problem, clustering technique has a basic role. Therefore, it is especially interested in many statisticians [3, 13, 35, 38, 42]. Building cluster is to divide a dataset into groups according to certain characteristics of the elements. Cluster analysis for discrete elements (CDE) was studied in the first time with many great contributions both theory and application [3, 4, 28, 35, 36, 39]. With the big and complex data such as images, each object needs to be considered as a distribution, clustering for the

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