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Comparative study of matrix refinement approaches for ensemble clustering

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Abstract Cluster ensembles or consensus clusterings have been shown to be better than any standard clustering algorithm at improving accuracy and robustness across various sets of data. This meta-learning formalism also helps users to overcome the dilemma of selecting an appropriate technique and the parameters for that technique. Since founded, different research areas have emerged with the common purpose of enhancing the effectiveness and applicability of cluster ensembles. These include the selection of ensemble members, the imputation of missing values, and the summarization of ensemble members. In particular, this paper is set to provide the review of different matrix refinement approaches that have been recently proposed in the literature for summarizing information of multiple clusterings. With various benchmark datasets and quality measures, the comparative study of these novel techniques is carried out to provide empirical findings from which a practical guideline can be drawn.

Keywords Cluster ensemble · Multiple clusterings · Summarization · Information matrix

1 Introduction

Although cluster analysis has proven useful in many different fields; e.g. customer relationship management (Wu et al. 2005), image processing (Costa and de Andrade Netto 1999),

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