

Clustering has an important role in data mining field. However, there is a large variety of clustering algorithms and each could generate quite different results depending on input parameters. In the research literature, several cluster validity indices have been proposed to evaluate clustering results and find the partition that best fits the input dataset. However, these validity indices may fail to achieve satisfactory results, especially in case of clusters with arbitrary shapes. In this paper, we propose a new cluster validity index for density-based, arbitrarily shaped clusters. Our new index is based on the density and connectivity relations extracted among the data points, based on the proximity graph, Gabriel graph. The incorporation of the connectivity and density relations allows achieving the best clustering results in the case of clusters with any shape, size or density. The experimental results on synthetic and real datasets, using the well-known neighborhood-based clustering (NBC) algorithm and the DBSCAN (density-based spatial clustering of applications with noise) algorithm, illustrate the superiority of the proposed index over some classical and recent indices and show its effectiveness for the evaluation of clustering algorithms and the selection of their appropriate parameters