عنوان مقاله:
Adaptive Gaussian Density Distance for Clustering

محل انتشار:
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خلاصه مقاله:
Distance-based clustering methods categorize samples by optimizing a global criterion, finding ellipsoid clusters with roughly equal sizes. In contrast, density-based clustering techniques form clusters with arbitrary shapes and sizes by optimizing a local criterion. Most of these methods have several hyper-parameters, and their performance is highly dependent on the hyper-parameter setup. Recently, a Gaussian Density Distance (GDD) approach was proposed to optimize local criteria in terms of distance and density properties of samples. GDD can find clusters with different shapes and sizes without any free parameters. However, it may fail to discover the appropriate clusters due to the interfering of clustered samples in estimating the density and distance properties of remaining unclustered samples. Here, we introduce Adaptive GDD (AGDD), which eliminates the inappropriate effect of clustered samples by adaptively updating the parameters during clustering. It is stable and can identify clusters with various shapes, sizes, and densities without adding extra parameters. The distance metrics calculating the dissimilarity between samples can affect the clustering performance. The effect of different distance measurements is also analyzed on the method. The experimental results conducted on several well-known datasets show the effectiveness of the proposed AGDD method compared to the other well-known clustering methods.

کلمات کلیدی:
Density-based Clustering, Distance-based Clustering, Gaussian Density