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Summary: Subspace clustering segments a collection of data from a union of several subspaces into clusters with each cluster corresponding to one subspace. The geometric information of the dataset reflects its intrinsic structure and can be utilized to assist the segmentation. In this paper, we propose side-information-induced reweighted sparse subspace clustering (SRSSC) for high-dimensional data clustering. In our method, the geometric information of the high-dimensional data points in a target space is utilized to induce subspace clustering as side-information. We solve the method by iterating the reweighted $l_1$-norm minimization to obtain the self-representation coefficients of the data and segment the data using the spectral clustering framework. We compare the performance of our proposed algorithm with some state-of-the-art algorithms using synthetic data and three famous real datasets. Our proposed SRSSC algorithm is the simplest but the most effective. In the experiments, the results of these clustering algorithms verify the effectiveness of our proposed algorithm.

MSC:
62H30 Classification and discrimination; cluster analysis (statistical aspects)
68T10 Pattern recognition, speech recognition
90C26 Nonconvex programming, global optimization

Keywords:
subspace clustering; geometric information; high-dimensional data; $l_1$-minimization; spectral clustering; self-representation

Software:
COIL-20; CVX

Full Text: DOI

References:
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