

عنوان مقاله:

A Study on Clustering for Clustering Based Image De-Noising

محل انتشار:

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خلاصه مقاله:

In this paper, the problem of de-noising of an image contaminated with Additive White Gaussian Noise (AWGN) is studied. This subject is an open problem in signal processing for more than 50 years. Local methods suggested in recent years, have obtained better results than global methods. However by more intelligent training in such a way that first, important data is more effective for training, second, clustering in such way that training blocks lie in low-rank subspaces, we can design a dictionary applicable for image de-noising and obtain results near the state of the art local methods. In the present paper, we suggest a method based on global clustering of image constructing blocks. As the type of clustering plays an important role in clustering-based de-noising methods, we address two questions about the clustering. The first, which parts of the data should be considered for clustering? and the second, what data clustering method is suitable for de-noising.? Then clustering is exploited to learn an over complete dictionary. By obtaining sparse decomposition of the noisy image blocks in terms of the dictionary atoms, the de-noised version is achieved. In addition to our framework, 7 popular dictionary learning methods are simulated and compared. The results are compared based on two major factors: (1) de-noising performance and (2) execution time. Experimental results show that our dictionary learning framework outperforms its competitors in terms of both factors.

کلمات کلیدی:

Image De-Noising; Data Clustering; Dictionary Learning; Histogram Equalization and Sparse Representation

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