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Super resolution reconstruction of infrared images based on classified dictionary learning

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ABSTRACT

Infrared images always suffer from low-resolution problems resulting from limitations of imaging devices. An economical approach to combat this problem involves reconstructing high-resolution images by reasonable methods without updating devices. Inspired by compressed sensing theory, this study presents and demonstrates a Classified Dictionary Learning method to reconstruct high-resolution infrared images. It classifies features of the samples into several reasonable clusters and trained a dictionary pair for each cluster. The optimal pair of dictionaries is chosen for each image reconstruction and therefore, more satisfactory results is achieved without the increase in computational complexity and time cost. Experiments and results demonstrated that it is a viable method for infrared images reconstruction since it improves image resolution and recovers detailed information of targets.

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