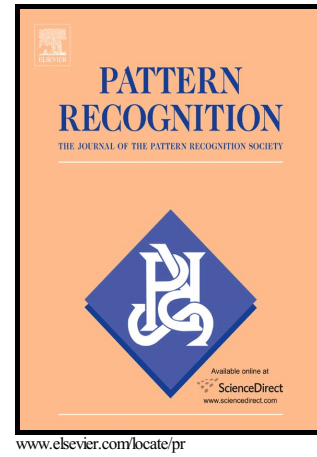


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Recognition

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Joint Learning Sparsifying Linear Transformation for Low-Resolution Image Synthesis and Recognition

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Abstract

Many computer vision problems involve exploring the synthesis and classification models that map images from the observed source space to a target space. Recently, one popular and effective method is to transform images from both source and target space into a shared single sparse domain, in which a synthesis model is established. Motivated by such a technique, this research attempts to explore an effective and robust linear function that maps the sparse representations of images from the source space to the target space, and simultaneously develop a linear classifier on such a coupled space with both supervised and semi-supervised learning. In order to capture the sparse structure shared by each class, we represent this mapping using a linear transformation with the constraint of sparsity. The performance of our proposed method is evaluated on several benchmark image datasets for low-resolution faces/digits classification and super-resolution, and the experimental results verify the effectiveness of the proposed method.

Keywords: Sparse representation, joint dictionary learning, sparse linear transformation, geometric optimization, low-resolution image classification.

1. Introduction

Sparse representations have recently drawn much interest in signal, image and

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