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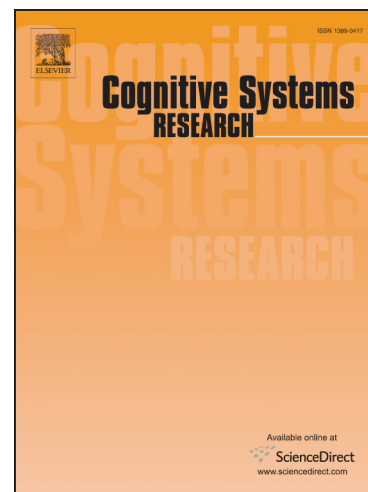
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Local Spatial Information for Image Super-Resolution

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Abstract- Image Super resolution plays a crucial role in many applications, such as medical imaging, remote sensing, and security surveillance. Recently convolutional neural network are becoming mainstream in computer vision. Most CNN based super resolution methods cannot fully exploit the entire feature from the original image, and thus the corresponding results will appear low resolution. In this paper, we propose a new network which can reconstruct a high resolution images by upscaling the low resolution images layer by layer with a small scale factor. This strategy helps network to possibly avoid of losing information. The existing CNN models involved bicubic interpolation for preprocessing, which leads to large feature maps and high computational loads. To settle of this problem, the proposed network directly extracts features from the input images, without using preprocessing. In addition, the proposed network investigates the spatial information which is represented by dissimilarities between a low resolution image and its corresponding high resolution by adopting a global residual learning. This differentiable strategy is inserted into the proposed network, to dynamically extract the feature maps. The proposed model not only achieves a compatible performance with the existing prominent methods but also, efficiently reduce the computational expenses.

Keywords: Super-resolution, Deep convolutional neural network, Spatial Features, Image processing.

1. Introduction

Image Super resolution is one of the classical problems in computer vision which aims to recover the lost information in the source image and reconstruct a visually high resolution image. Generally, when a pixel contains in image have a high density, thereby it can provide a high quality vision. Initially there was little interest in this technology, overtime with the improvement of the technology; the need of resolution enhancement cannot be overlooked in many crucial applications, such as security surveillance, medical imaging, remote sensing, object recognition [1, 2, 5, 6, 32]. In essence, the performance of pattern recognition and imaging system will be improved if a high resolution image is provided. But, it is very hard to resort the high-resolution images from a low-resolution input, since, usually the number of pixels in HR images are larger than LR images in input. Therefore, recovering a HR images from LR images are still a challenging task. The idea behind image resolution is to combine the useful and non-redundant information which contained in the low-resolution cases to create a high-resolution image. Deep learning- especially convolutional neural networks- are becoming a mainstream in many computer vision applications, but in case of image resolution problem, is still in its infancy. However, deep learning models

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