**Low-Rank Neighbor Embedding for Single Image Super-Resolution**

**ABSTRACT:**

This letter proposes a novel single image super-resolution (SR) method based on the low-rank matrix recovery (LRMR) and neighbor embedding (NE). LRMR is used to explore the underlying structures of subspaces spanned by similar patches. Specifically, the training patches are first divided into groups. Then the LRMR technique is utilized to learn the latent structure of each group. The NE algorithm is performed on the learnt low-rank components of HR and LR patches to produce SR results. Experimental results suggest that our approach can reconstruct high quality images both quantitatively and perceptually.

**EXISTING SYSTEM:**

HIGH-RESOLUTION (HR) images are needed in many practical applications. Super-resolution (SR) image reconstruction is a software technique to generate a HR image from multiple input lowresolution (LR) images or a single LR image.n learning-based methods, how to utilize the training set is very crucial. Patches are various in appearance. Thus it is nec-essary to divide the whole training set into groups by certain strategies such that patches in each group are highly related. Therefore, the subspace spanned by them is low-dimen-sional. However, how to learn the low-dimensional structure of such a subspace is also a challenge. In this letter, we employ a robust PCA approach, the low-rank matrix recovery (LRMR) , to learn the underlying structures of subspaces. LRMR has been successfully applied to various applications, such as face recognition and background subtraction . Given a data matrix whose columns come from the same pattern, these columns are linearly correlated in many situations and the matrix should be approximately low-rank.

**DISADVANTAGES OF EXISTING SYSTEM:**

1.The reconstruction weights of one LR patch should be extremely similar.Unfortunately, it is not always the case dueto the one-to-many mappings from LR to HR patches .

**PROPOSED SYSTEM:**

In this letter, we overcome this problem by using LRMR since the linear correlation relationship of patches is enhanced through LRMR and thus the local structure of manifold constructed by LR or HR patches is more compact. The NE assumption that the manifolds of LR and HR patches have similar local structures is more satisfied after LRMR procedure. we draw distributions of the standard correlation coefficients between the reconstruction weights of pairs of LR and HR patches for the original NE algorithm and the LRMR method respectively. It is shown that the reconstruction weights of LR and HR patches for LRMR are more consistent with the NE assumption than those of the original NE algorithm, which means the LRMR proce-dure can improve the performance of the NE-based SR method. Therefore, we propose to apply the LRMR technique to perform NE-based SR in this letter.

**ADVANTAGES OF PROPOSED SYSTEM:**

1.The proposed method is easy to perform and can get excellent results.

2.It overcomes one-to-many mappings from LR to HR patches .

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Pentium IV 2.4 GHz.
* Hard Disk : 40 GB.
* Floppy Drive : 1.44 Mb.
* Monitor : 15 VGA Colour.
* Mouse : Logitech.
* Ram : 512 Mb.

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows XP/7.
* Coding Language : MATLAB
* Tool : MATLAB R 2007B

**REFERENCE:**

Xiaoxuan Chen and Chun Qi, Member, IEEE”**Low-Rank Neighbor Embedding for Single Image Super-Resolution”**IEEE SIGNAL PROCESSING LETTERS, VOL. 21, NO. 1, JANUARY 2014.