Abstract
This paper describes an approach of image noising and denoising by the Principal Component Analysis (PCA) method with Local Pixel Grouping (LPG). PCA fully de-correlates the original data set so that the energy of the signal will concentrate on the small subset of PCA transformed dataset. As we know energy of noise evenly spreads over the whole data set, we can easily distinguish signal from noise over PCA domain. It consists of two stages: image estimation by removing the noise and further refinement of the first stage. The noise is
significantly reduced in the first stage; the LPG accuracy will be much improved in the second stage so that the final denoising result is visually much better. It also describes an algorithm capable of locating training samples selected from the local window by using block matching based LPG. Experimental results demonstrates that using LPG-PCA method the denoising performance is improved from first stage to second stage with edge preservation.

Reference


Index Terms

Computer Science Image Processing

Key words

PCA

Denoising

LPG