Noise level estimation for digital images using local statistics and its applications to noise removal

ABSTRACT

In this paper, an automatic estimation of additive white Gaussian noise technique is proposed. This technique is b uilt according to the local statistics of Gaussian noise. In the field of digital signal processing, estimation of the noise is considered as pivotal process that many signal processing tasks relies on. The main aim of this paper is to design a patch-b ased estimation technique in order to estimate the noise level in natural images and use it in b lind image removal technique. The estimation processes is utilized selected patches which is most contaminated sub-pixels in the tested images sing principal component analysis (PCA). The performance of the suggested noise level estimation technique is shown its superior to state of the art noise estimation and noise removal algorithms, the proposed algorithm produces the b est performance in most cases compared with the investigated techniques in terms of PSNR, IQI and the visual perception.