Abstract

Diabetic Retinopathy (DR) is one of the leading cause of blindness. Digital image processing has been effectively used for the screening, diagnosis and treatment of DR in order to lessen the burden of the ophthalmologist. The use of good quality retinal images is very essential for accurate detection, diagnosis and damage assessment of retina. Non-uniform illumination and poor contrast due to the anatomy of fundus image, opaque media, and wide angle optics of the camera, insufficient pupil size, sensory array geometry, and the movement of the eye are the major causes of the low quality retinal images. This paper presents comparisons of four nonlinear denoising techniques namely: median filter, weighted median filter, adaptive median filter and decision based median filter for removal of impulse noise in retinal images. Computational work has been carried out on retinal images garnered from both hospital and publicly available DIARETDB1 dataset. The performance of these denoising filters was evaluated using Peak Signal to Noise Ratio (PSNR) and Mean Square Error (MSE). Further, to assess the structural information content in such filtered images, first order entropy is estimated.
The results proved that, decision based median filter emerged as an filter both in terms of high PSNR and low MSE. Added to this, the entropy signifying the retention of structured content is also at high level of 6.4 bits/pixel.

References

17. Ms. ARCHANA H. SABLE, Dr. Mr. GHIRISH CHOWDHARY, “A Novel Clipped Decision
Based Median Filter for Removal of High Intensity Salt and Pepper”, College of Engineering.


Index Terms

Computer Science Image Processing

Keywords