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Histogram Equalization-Based Techniques for Contrast Enhancement of MRI Brain Glioma Tumor Images: Comparative Study

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Abstract: In Magnetic Resonance Imaging (MRI), the poor images quality, particularly the artifacts inherent to this type of images as well as the low contrast between tissues and interindividual variability, could make difficult the image analysis and affect the accuracy of clinical diagnosis. Therefore, the need for image enhancement techniques arise to improve the relevant image contents through reducing the noise while preserving the actual details features. Various MRI images denoising techniques have been proposed in literature where each technique has its advantages and limitations. Among them, the Histogram modifications-based approaches arise as the most employed, by many researchers, for MRI contrast enhancement. This project presents a comparative study of the most histogram-based techniques, mainly AHE, CLAHE, BPDHE and AIR-AHE techniques, dealing with denoising and contrast enhancement MRI images. Experimental study, using real-world databases, is performed based on evaluation of quality measurement metrics: absolute mean brightness error (AMBE), peak signal to noise ratio (PSNR) and Entropy.

Keywords: Brain MRI, medical image processing, enhancement, sorting technique, rgb to gray, dot processing

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