

Comparative Study of Different Enhancement Techniques for Computed Tomography Images

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Abstract : One of the key problems facing in the analysis of Computed Tomography (CT) images is the poor contrast of the images. Image enhancement can be used to improve the visual clarity and quality of the images or to provide a better transformation representation for further processing. Contrast enhancement of images is one of the acceptable methods used for image enhancement in various applications in the medical field. This will be helpful to visualize and extract details of brain infarctions, tumors, and cancers from the CT image. This paper presents a comparison study of five contrast enhancement techniques suitable for the contrast enhancement of CT images. The types of techniques include Power Law Transformation, Logarithmic Transformation, Histogram Equalization, Contrast Stretching, and Laplacian Transformation. All these techniques are compared with each other to find out which enhancement provides better contrast of CT image. For the comparison of the techniques, the parameters Peak Signal to Noise Ratio (PSNR) and Mean Square Error (MSE) are used. Logarithmic Transformation provided the clearer and best quality image compared to all other techniques studied and has got the highest value of PSNR. Comparison concludes with better approach for its future research especially for mapping abnormalities from CT images resulting from Brain Injuries.

Keywords : computed tomography, enhancement techniques, increasing contrast, PSNR and MSE

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