

A NOVEL APPROACH TO IMPROVE THE CONTRAST OF X-RAY IMAGES USING MULTISCALE MORPHOLOGY

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ABSTRACT

Generally the enhancement techniques are applied on different types of images. Due to inadequate focusing and unavailability of expertise while acquisition the images captured are low contrast images. Image enhancement is performed in order to improve the quality of the image. Contrast enhancement is a most preferable technique to improve the overall quality. X-Ray images generated are of low contrast due to bulk amount of liquid, air and soft tissues in the body. Low contrast images provide insufficient amount of information to detect and diagnose diseases so they need to be processed and improved. A common algorithm was designed to enhance all type of medical images performing global enhancement and less visibility of edges. The present work is based on the contrast improvement for the x-ray images using multiscale morphological transformations. In this thesis work, multiscale structuring element is used to enhance the x-ray images using disk shape structuring element at different scales to extract bright and dark portions at all scales and its neighboring scales. The proposed algorithm is used to extract the dark and bright portions at all scales of input image and then find average of all the white regions of image and dark regions too. Addition of difference of these two regions is done to input image. Then summation of white regions at all scales and neighboring scales is done and similarly for black regions is done. After that difference of white and black regions is added to earlier obtained image to attain the enhanced image. Further the results are compared with other state-of-the-art techniques like Histogram Equalization (HE), Contrast Limited Adaptive Histogram Equalization (CLAHE), Single Scale, Bai and Zhou, Kaur et.al using Entropy, Detail Variance (DV) and Background Variance (BV) as image quality evaluation metrics. Thus the resultant obtained image is more extracted and gives better results quantitatively as qualitatively.