UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG

CONTRAST ENHANCEMENT FOR COLOUR IMAGES BASED ON DISCRETE WAVELET TRANSFORM

NOOR AFINA BINTI MOHDZAIDI

Faculty of Electrical Engineering

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ABSTRACT

Low contrast images demanded contrast enhancement algorithm to intensify the visual outcomes by displaying more details. The image is facing trouble from poor contrast and scarcity of information since the image intelligibility simply affected by a diverse environment situation or quality level of photography equipment used. However, the contrast enhancement algorithm normally challenging to fulfil the desired results so the image processing is executed manually for each specified images. This report recommended the image enhancement scheme using DWT implement to the Saturation components with the decomposed approximation coefficients modify by a derived mapping function of scale-up triangle transform while the Luminance component can enhance by using the CLAHE. This enhancement algorithm demands the vice versa conversion between the RGB and HSV colour space where modification of specification desired can achieve in HSV colour space. The qualitative and quantitative performance evaluation can be recognized by using the subjective of visual quality display assessment and objective parameters by AMBE, MSE and PSNR. Therefore, the performance evaluation received can prove that the improvement result of the algorithm implemented by MATLAB can be accomplished.

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TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1.1   OVERVIEW OF STUDY

The world can be visualised with images that depict visual perception of objects, phenomena and scenes of the life. The images are illustrating the gray scale or colours space by an array of pixels which included contrast exists in that image. The contrast can be detectable by the dissimilar in colour and height brightness of luminance or intensity level reflected from various adjacent surfaces within visual perception that make its discernible in an image. The visual perception by human being is more aware towards contrast exist compared to the right luminance, therefore the world can be perceived without taking into account of the considerable changes in illumination state. The image that having low contrast are relate to the situation when there exist the mid-shaded of gray formed by objects that fade into each other. Hence, the image facing trouble to interpret the exact information in some region due to contrast sensitivity becomes the important measurement of visual function. In opposite, the good variation of contrast makes visual appearance of an image can be visual perception interpretable by human beings or machine.

Therefore, the contrast enhancement becomes the crucial role in the image processing application to provide a better visual perception of the suffered image from poor contrast like aerial images, satellite images, medical image analysis, scientific visualisation, and even digital photographs. According to this requirement, the method of DWT and CLAHE have been proposed since it widely utilized due to its easy to program and gain the result in reduction of time by implemented this technique in MATLAB through many algorithms technique for designing an image enhancement system. The DWT is used for compression, image resolution, face detection, feature extraction and de-noising whereas the intensities can be better distributed on Histogram equalization technique which able to enhance the quality of images.