Contrast Enhancement Base shadow removal

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Abstract

Shadows Occur in images where objects are irradiated by strong directional lights. Shadows will significantly influence the effects of image processing, such as object detection and image segmentation. Shadow removal has been an important subject as one kind of preliminary processing methods and various algorithms have emerged. In this paper, we present an algorithm of shadow removal for single regions using Adaptive histogram Equalizer to detect shadows and contrast enhancement technique in Object trace And Morphological operation to remove shadows. Contrast enhancement techniques are used for improving visual quality of low contrast images .Adaptive Histogram Equalization (HE) method is one such technique used for contrast enhancement. Image contrast enhancement techniques are of particular interest in photography, satellite imagery, medical applications and display devices. Producing visually natural image is required for many important areas such as vision, remote sensing, dynamic scene analysis, autonomous navigation, and biomedical image analysis.

Keyword : - *Contrast Enhancement , shadow removal, Adaptive histogram Equalizer,Adaptive Filter, Object Trace ,Morphological Operation.*

1.INTRODUCTION

Contrast Enhancement is improving the quality (clarity) of images for human viewing. Removing blur and noise and increasing contrast, and revealing details are examples of enhancement operations. In this system deals with enhancement of images with poor contrast and detection of background. Propos work is a frame work which is used to detect the background in images characterize by poor contrast. Image enhancement has been carried. The first method employs information from image background analysis used by various techniques such as histogram equalization method and edge detection Techniques, the multi-background gray scale images using morphology. The new method is proposed in which contrast enhancement is attained using adaptive linear filters for image sharped and morphology. The complete image processing is done using MATLAB. Image Processing basically includes analyst, manipulations, storage and display of graphical images from sources such as photos, drawings and so on. A shadow occur when an item halfway or absolutely blocks coordinate light from a light source, which is an ever-introduce part of our visual experience. Shadows in pictures have for quite some time been troublesome to PC vision issues, for example, object division, following, acknowledgment and soon. By and by, shadows cause issues, for example, shape mutilation, object combining and disappointment of article recognition and division

2. SHADOW DETECTION METHODS

2.1 Shadow detection using Segmentation

In the detection method shadow and unshaded regions are separate by SVM classifier. This classification are procedure using implement in a supervised way by means of a support vector machine (SVM), which are showed in the effectiveness in data classification. The classification task is performed to extracts the features of the original image with the help of wavelet transform. Initial level wavelet transform is used and applied on each spectral band which consists of some frequency features. Morphological filters are introduce to deal with the problems occur and to improve the quality by their effectively and to increase the capability in the shape preservations are performed by the possible to adapt them according to the image filtering techniques extracting the borders and shape of the surface [4].

2.2 Edge Detection and Boundary Extraction

This function look for place in the image where the intensity changes , using one of these two criteria Places where the first derivative is the intensity is larger in magnitude than some threshold. thane where the second derivative of the intensity has been a zero crossing. Edge is provide a number of derivative estimator and each one these derivative implement on any one of the criteria mentioned above. Operation sensitive area could also be defined in edge detection such that it includes place like detection across horizontal edge, vertical edge, or both. This techniques when used returns a binary image of the input, i.e. 1"s and 0"s. Consider the images of coins in an image that need to be extracted using boundary extraction techniques. Following is an example of using image of coins from daily life for edge detection of the coins. This image is having a uniform background [9].

3. SHADOW REMOVAL METHODS

3.1 Morphological

Morphological is a technique of image processing based on shape and form of objects. Morphological method is applying a structure element to an input image, creating an output image at the same size. The value of each pixel in the input image is the based on a comparison of the corresponding some pixel in the input image with its neighbours. By choosing the size and shape of the neighbour, you are construct a morphological operation that is sensitive to specific shapes in the input image. The morphological operations can firstly define on gray-scale images where the source image is single-channel., Various techniques and common approaches to solve the problem of particle identification are Image Filtering ,and Boundary detection, Edge Detection, Linear Filtering, Segmentation, Morphological operations: Dilation and Erosion etc. But most of these techniques are alone fail to accurately determine the objects real boundaries due to the problem of non-uniform illumination in the background of the some images due to which most useful of the particles appear to be either dark or light in an image and using techniques such as segmentation [9].

3.2 Adaptive Histogram Equalization:

For images which contain the local regions of low contrast bright or dark areas, global histogram equalization won to work effectively. A modification of histogram equalization is called the Adaptive Histogram Equalization is used in such images for better results. Adaptive histogram equalization is work by considering only small regions and based on their local cdf, performing some contrast enhancement of those regions .Adaptive histogram equalization can be implemented by some methods and each of those methods have multiple variation. For the purpose of this project I have implement AHE using a "tiled windows with interpolated mapping" method as described in the paper - "Adaptive Histogram Equalization and its Variations" by Pfizer. This function is implemented in the program ahe.cpp by the function tiled AHE. The main steps performed by this function are:

3.3 Contrast Enhancement and Boundary Tracing

An algorithm with morphological opening in combination of linear filters such as mean filters and then remove the non- uniform background illumination by using morphological opening of some of the image with this structuring element. Background approximation have been taken as the criteria to determine the close proximity to the non-uniform background extraction using some techniques such as mean Filtering and our new technique based on morphological processes and successive dilation and erosion followed by contrast enhancement for the accuracy of particle extraction for lateral image processing in concatenation with mean filter and threshold at the end to improve the image contrast [9]

4. SYSTEM FLOW CHARTS

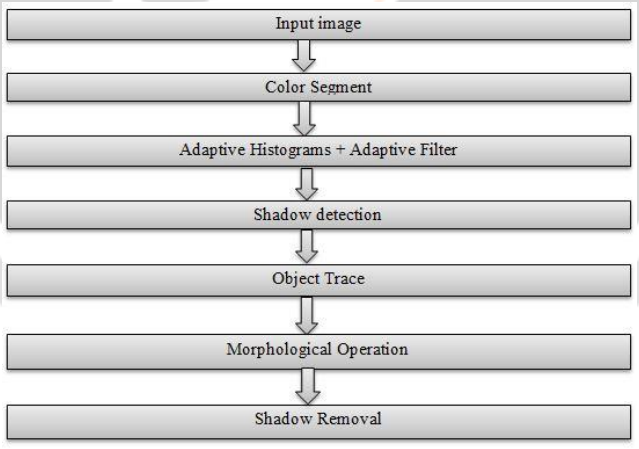

Fig 4.1 Flow chart of system

5. EXPERIMENTAL RESULT

5.1 Original Image

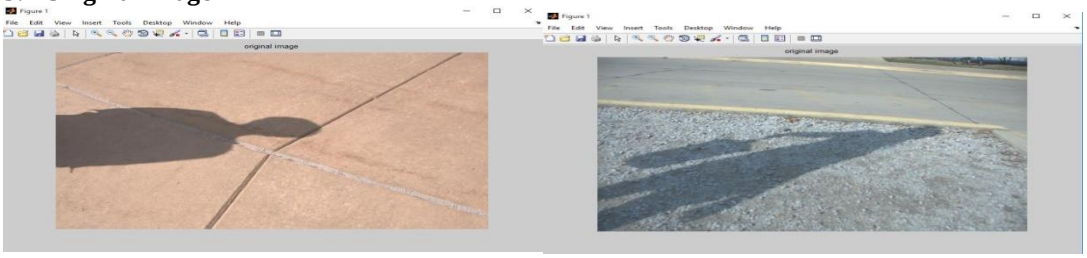

Fig 5.1 Original Images

5.2 Boundary Detection

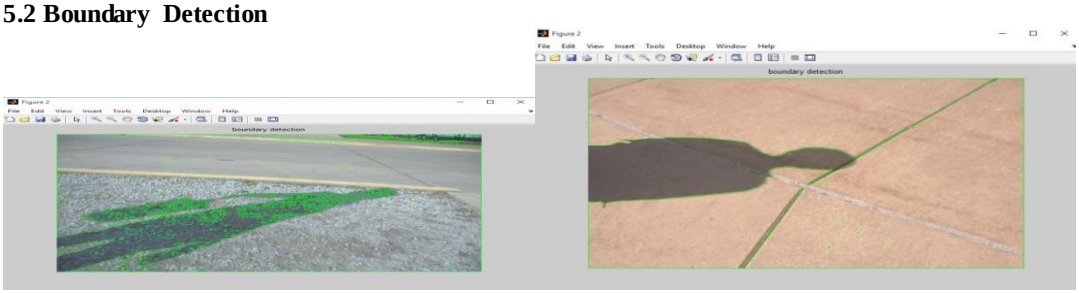

Fig5.2 Boundary detection

5.3 Adaptive Histogram Image

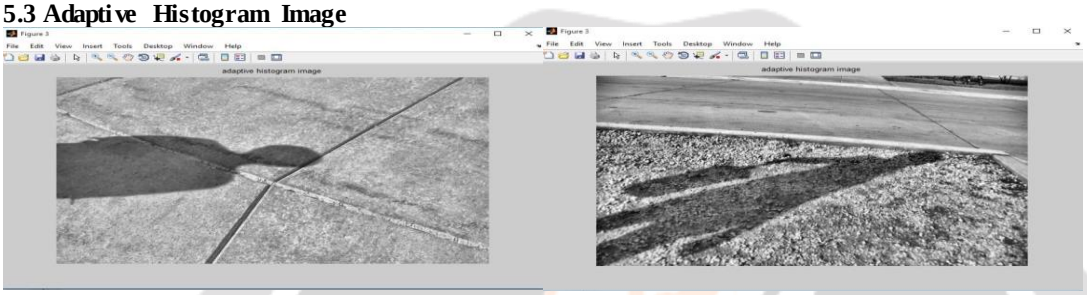

Fig 5.3 Adaptive Histogram image

5.4 Adaptive Adjustment Image

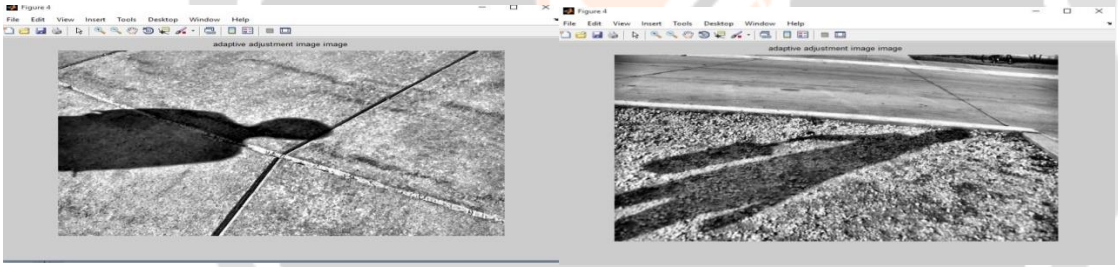

Fig 5.4 Adaptive Adjustment

5.5 Shadow Detection

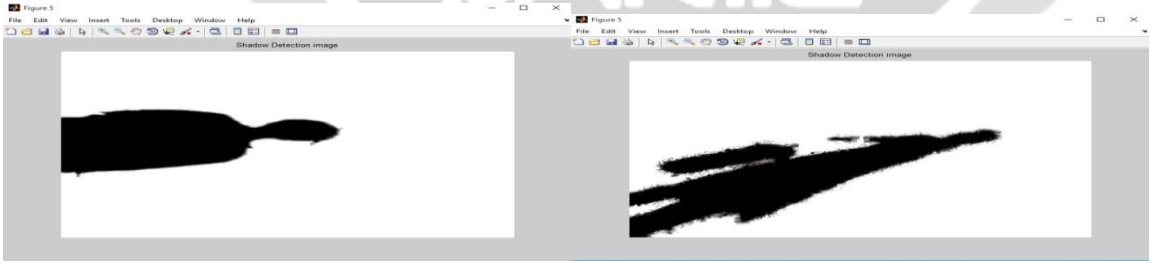

Fig 5.5 Shadow Detection

5.6 Object Traced

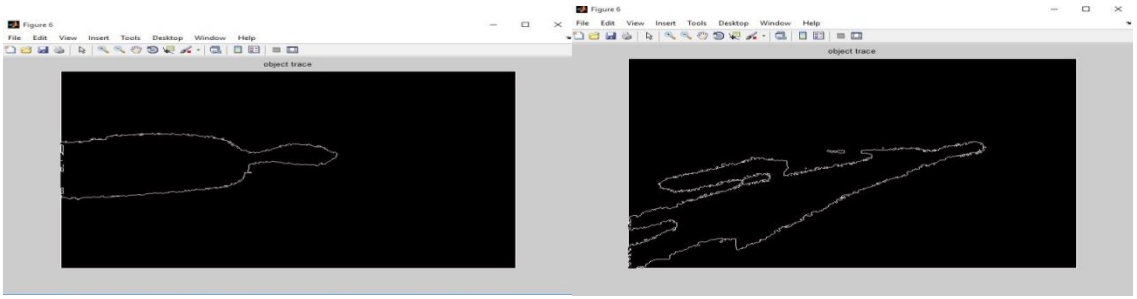

Fig 5.6 Object trace

5.7 Shadow Removal

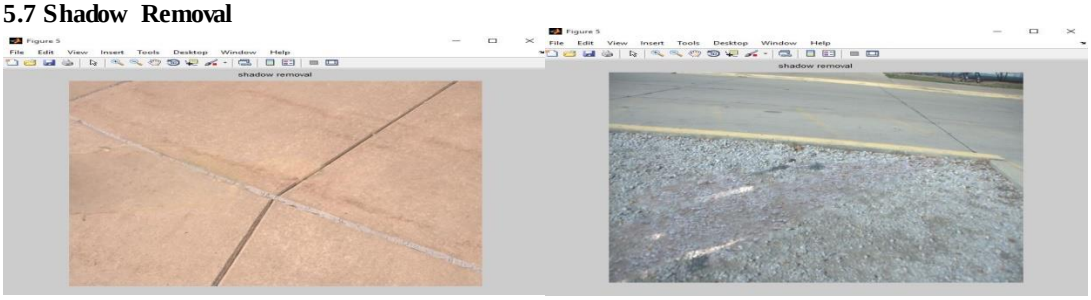

Fig 5.7 Shadow Removal

5.8 The Result Values

Img _no	Name	Contrast value_original image Value		Contrast value_output image Value	
		Min	Max	min	Max
1)	Image - 1	40.9641	41.3532	82.6797	84.2262
2)	Image - 2	28.2389	28.7204	65.9256	73.5619

6. CONCLUSIONS

In this work, Adaptive Histogram Equalizer has been used to detect shadow and is removed using Object Trace. Contrast enhancement technique is applied in order to remove shadow in efficient manner and accuracy is improved as compared to current method of detection and removal. I have compared the contrast value of original image with shadow and image after removing shadow for quantitative measure to find out that shadow has been removed. Contrast value increases in the output image as the removal of shadow decreases the dark part of image.

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