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Enhancement of Image Using DCT Co-Efficient

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ABSTRACT:

DCT coefficients by scaling the concept of color image enhancement provides a new technique for color enhancement in the compressed domain. This method is more efficient than the method of calculation based on the spatial domain. With regard to the details of the image sharper image contrast enhancement is most often deals with such development. The film is based on the principle of a local intensity or color variations expands to increase the visibility of the construction details and other features. Due to the presence of a strong background illumination intensity, small ranges of values. The range of the original image on a display device a very large bit-planes to a limited number of accommodations, to.

The problem is further complicated when the image brightness can vary widely. Consequently, if the image is too dark in some other places it will be very bright. It is a reflection of the blue sky and the brightness of the display, which can affect the car can be seen on the glass window. DCT coefficients by scaling the color used to improve the image and make it less time consuming method to reduce computational complexity.

Keywords:

growth, DCT (Disctere Cosine Transform).

INTRODUCTION:

Image enhancement to help our visual perception of the need for better visualization than or rendering images. Due to the presence of a strong background illumination intensity, small ranges of values. The range of the original image on a display device a bit-planes to a limited number of accommodations, to the large. In contrast to the sharpness of the details relating to the development of the film deals with the promotion of the film.

Methods to increase the visibility of the construction details and other features within an image that extends the principle of local variations in intensity or color designed. A majority of the methods of gray-scale images in the spatial domain extension will have moved. It is also the color of the methods adopted include the promotion of a positive image histogram equalization, unsharp masking, the difference in growth, Homo morphic filtering, high-pass and low-pass filter can have. However, color images, as well as for improving the chromatic information is also taken into account. In connection with the algorithms are the RGB color coordinates, etc., HSV, YCbCr are transformed into a different location, such as the proposed algorithm is only one scale factor for both DC and AC modules with the same factor that scales as well as the chromatic components. The human visual system, color processing, describing the color, saturation, and color in terms of intensity of the reflection. It is to adjust the colors for the multi-level filter with a Gaussian kernel and the need for post-processing stages. DCT coefficients by scaling the color used to improve the image and make it less time consuming method to reduce computational complexity.

IMAGE ENHANCEMENT:

The growth performance of the film and a graphic display more useful for the analysis of such margins, borders, or the accentuation of the features in contrast to the image, or the sharpening marks. The growth process does not increase the content of the data underlying the information. But they can be easily selected to determine the features that will increase the dynamic range. The gray scale image enhancement and contrast manipulation, noise reduction, edge preserving and sharpening, filtering, interpolation and magnification, and gave a fake coloring. The great difficulty is to calculate the scale of the development of image enhancement. Therefore, a large number of image enhancement techniques, empirical and interactive processes required to obtain satisfactory results.

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However, almost all of the images in the image enhancement process because the application is a very important aspect of its use. With regard to the details of the image sharper image contrast enhancement is most often deals with such development. These techniques to increase the visibility of the construction details and other features within an image that extends the principle of local variations in intensity or color designed.A majority of the methods of gray-scale images in the spatial domain extension will have moved. These techniques also have been adapted for color image enhancement techniques, etc. This adaptive histogram equalization, un sharp masking, the constant growth of the variance, Homo morphic filtering, high-pass, low-pass filter and there. However, considering the colorful images, as well as policies for enhancing the chromatic information.

In many such algorithms, such as the colored parts of the achromatic component of RGB color coordinates are uncorrelated and so much more from the change in a different location, such as HSV and YCbCr. Models describing the physiology of the human visual system to deal with the processing of color in color, saturation, and color in terms of intensity and allowed to represent. For example, some of the work are reported in the RGB space, Jobson retinex theory led to a better use of the excellent quality of the images. Multi-level Gaussian kernel for it to adjust the colors and the post-processing step to the filter, the technique is computationally intensive.

DISCRETE COSINE TRANSFORM:

Discrete Cosine Transform (DCT) cosine functions oscillating at different frequencies is limited in terms of a whole series of data points in this. DCT to spectral methods for the numerical solution of partial differential equations (short high-frequency components can be removed) lossy audio compression (eg MP3) and images (eg JPEG) from the many applications in science and engineering are important. The use of cosine rather than sine functions is critical in these applications: compression (less a typical signal is at least necessary, as described below), differential equations, cosines express cosine functions, however, will be more effective in specific choice of boundary conditions. Color image enhancement algorithm for operation of the proposed three stages.

First, it adjusts the brightness of the background. Preserves the native contrast of the image to the next step and preserves the colors of the final image. Moreover, in the space of a block DCT, DCT coefficients from the algorithm tries to exploit the advantage of having localized information. All parts of the algorithm (size 8 * 8) is designed to be handled independently of each block. Is more suitable for parallel execution. That is a color picture of the performance based on three fundamental factors

A.Adjustment of local background illumination
B.Preservation of local contrast
C.Preservation of Colors

A.Adjustment of local image background:

Local background brightness adjustment, use a block of the DC coefficient. DC gives the value of the average of the Black brightness distribution. This is done by mapping values to adjust the brightness to the desired range. This function must be monotonic in the range. Us (compressed stream might be available from the title) Let us denote the value of Imax maximum brightness of the image.The luminance component (Y) is referred to by an 8 * 8 block DCT coefficients Let {Y (k, l), o <k, <7}. Then Y (o, o) DC coefficient and the AC modules. We normalized by adjusting local brightness to indicate DC and AC modules, the DC coefficient following the break [0,1] is a monotonically increasing function to the map.

$$\hat{\bar{y}}(0,0) = I_{\max} \cdot f\left(\frac{\hat{y}(0,0)}{I_{\max}}\right).$$

The function f (x) function T (x), n (x), S-function can be selected in various ways, such as Ψ twicing (x)
The reasons for choosing these functions are as follows

i)Considering image enhancement algorithms.

ii) There is no single function which has been found to provide the best performance for every image. Our objective here is to observe the performances of proposed algorithm with different choices of these mapping functions. There are also other advantages for using each of the above functions.

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The first one, T (x) Twicing function is easy to implement. It is a parameter, and a variety of images that have been found to be very effective in brightening the dark areas. Twicing function can be obtained by using the equation below, Fig.1. Mapping plot for T(x)

$$\tau(x) = x(2-x), \quad 0 \le x \le 1$$

The second one, n(x) is also relatively simpler (than the third one). It has a single parameter which should be centered on 2. This function works well both in the dark and bright regions. n(x) is obtained by using the below equation

$$\eta(x) = \frac{\left(x^{\frac{1}{\gamma}} + \left(1-(1-x)^{\frac{1}{\gamma}}\right)\right)}{2}, \quad 0 \le x \le 1$$

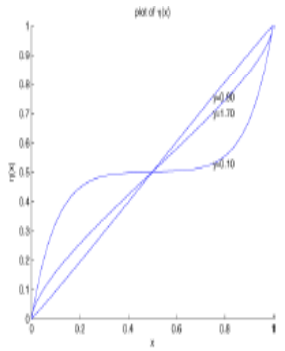

Fig.2. Mapping plot for n(x)

Last, Ψ (x) is one of the most complex. It has four parameters, m, n, p1 and p2 is. However, it is effective [m, 1]) separately (for dark area and bright area, p2) p1 for choosing between different values [0, M] and between bright areas and dark areas ((control. It is also to note that Ψ (m) = n. Ψ (x) is calculated by using the following equation,

$$\psi(x) = \begin{cases} n\left(1-\left(1-\frac{x}{m}\right)^{p_1}\right), & 0 \le x \le m \\ n+(1-n)\left(\frac{x-m}{1-m}\right)^{p_2} & \\ m \le x \le 1, & 0 \le m \le n \le 1, p_1, p_2 > 0 \end{cases}$$

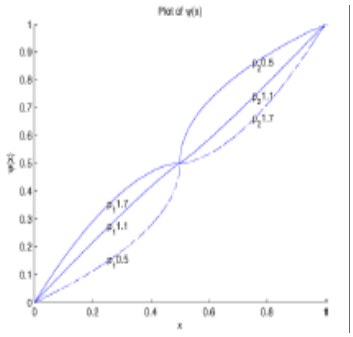

Fig.3. Mapping plot for Ψ(x)

After the images as a result of the application of these operations are depicted in Fig. See less saturated colors, enhanced images and colors, it can be seen that there is scope for further improvement of the performance.

Preservation of local contrast:

Adjust the luminance enhancement factor for a block of time, such as Define

$$\kappa = \frac{\tilde{Y}(0,0)}{Y(0,0)}$$

Mapped DC coefficient and Y (0,0), where the DC coefficient. Since DCT is a linear block pixel values of the multiplication factor in the results of y multiplying all the modules, transform.This also preserves the black contrast. However, the standard deviation σ Bmax represents the maximum take account of and beyond the Black brightness can be controlled by means of the distribution of pixel values of μ there is a risk of overflow.

The distribution of the brightness values lie and be able to assume a constant. By the following theorem says that the case should lie within the interval k.Preservation of ColorsAs described before scaling operation restricted to (8) and (9) to protect the colors. To perform this operation found that the previous enhancement algorithms. These methods are not only the luminance component Y Cb and Cr components to change the immutable put chrominance.

Chrominance components in the YCbCr color space in the RGB color space, although better than the correlation DE, Y values are rising in partSince the colors are usually saturate. Cb and Cr unchanged, keeping the R / G and B / G, both of which pose a Y, however, decreases with increasing G> R and G> B, RGB space, going from the Y-CB-Cr space conversion matrix may have noticed from. Also, the components to be processed to ensure chromatic colors.

In this case, the values of chromatic components due to better scaling operation (in spatial domain) is also likely to fall outside the scope of representation. One limiting factor in the development of this strategy can be used as described in the previous section. However, our experiments with different images.

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Algorithm:

Step 1: Initialize an RGB image. By using below commands.

I=imread ('peppers.png');
Imshow (I);

Step 2: Converted that RGB image in to YCbCr image. By using below commands.

I=imread ('peppers.png');
J=rgb2ycbcr (I);
Imshow (J);

Step 3: Apply DCT (Discrete Cosine Transform) method to that YCbCr image

RESULT AND ANALYSIS:

Brightness Enhancement: In this Brightness Enhancement perform 3 functions of operations for better performances. They are

1.T(x) Twicing function
2. n (x) γ-function
3. Ψ(x) S-function

1. T(x) Twicing function:

It is simple to implement. It convert dark region in to bright region

Fig.4. Mapping plot for n(x)

2. n (x) γ-function

It has a single parameter . This function works well both in the dark and bright regions.

Fig.5. Enhanced image DC coefficients for n(x)

3.Ψ(x) S-function:

Fig.5. Enhanced image DC coefficients for Ψ(x)

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