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DARK IMAGE ENHANCEMENT

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ABSTRACT

For the most part, the picture upgrade method works on the visual nature of the inferior quality low-light pictures. It upholds further undeniable level PC vision errands to remove significant data from the caught pictures. Low-light pictures commonly experience the ill effects of two issues. To begin with, they have low perceivability (i.e., little pixel values). Second, commotion becomes huge and disturbs the picture content, because of low signal-to-noise proportion. Most existing low light picture upgrade strategies, be that as it may, gain from noise-negligible irrelevant datasets. Image enhancement is the most basic advances used to control a picture, so the outcome is more satisfactory than the first picture, with a pursue saving everything about, the field of digital image processing. With the popularity of PC visual innovation, advanced digital image processing ideas have been quickly utilized in numerous genuine applications for data gathering, for example, modern creations, clinical pictures, video observing, clever transportations, and so on. Notwithstanding, picture caught under low light has a few issues to such an extent that it might contains commotion, goes through variety bending and furthermore may goes through with some data misfortune. Again, industry like clinical and satellite we can't manage the cost of single data to be miss, for to the point that reason low light image enhancement is a must require idea for current arising world. Here in this paper, we examine various techniques for picture upgrade and their outcome, predominantly this paper centre around making a user interface to get a quick result of an input image to an enhanced image.

KEY WORDS: Dark Image, Retinex, Single Scale Retinex, Multi Scale Retinex, Multi Scale Retinex with Colour Restoration, Gaussian blur, Log transformation, Enhanced Image.

I. INTRODUCTION

The irregular enlightenment, especially high unique lighting climate, creates many issues in an image.

For instance, the pictures obtained by computerized cameras, camcorders, or different terminals(we get clearer image in cameras as compared with mobile camera, in mobile camera as compared with tablets, in tablets as compared with personal computers etc.,) will generally be splendid or dim in specific regions, the objective is hard to be recognized and a few different issues.

To tackle the issues for the nature of picture obtaining brought about by irregular enlightenment, a series of strategies had been advanced progressively, including histogram adjustment, picture upgrade in gradient field, homomorphic filter and the Retinex (Retina + Cortex) hypothesis. Among these techniques, the Retinex has turned into an examination area of interest as of late as it could accomplish a decent equilibrium in powerful compression, edge improvement and color consistency.

In this Retinex algorithm specified project we are using SSR(Single Scale Retinex), MSR(Multi Scale Retinex), MSRCR(Multi Scale Retinex with Color Restoration) and also comparison between those algorithms.

Figure-1: Architecture

Techniques That are used:

- SINGLE SCALE RETINEX(SSR)
- MULTI SCALE RETINEX(MSR)
- MULTI SCALE RETINEX WITH COLOR RESTORATION(MSRCR)

II. EXISTING SYSTEM

Existing System are based on picture upgrade in gradient field, homomorphic filter, CNN etc. In that CNN is said to be an efficient one to enhance images using training data quickly. But this system helps to enhance images which are having low intensity not for the high intensive parts in image like sunlight.

III. DISADVANTAGES OF EXISTING SYSTEM

- CNN uses large amount of training data for accurate results which consumes memory of system.
- It doesn't enhance highly illuminated parts of the image.
- It mainly for the low intensive images only.

IV.PROPOSED SYSTEM

Our System takes an input of jpg format image, and it provides the enhanced image to the user by using retinex model internally.

The Retinex model is a color perception model of human vision, which consists of illumination and reflectance which is said to be the best and efficient model for image enhancement for both high and low intense areas of an image up to now.

V. ADVANTAGES OF PROPOSED SYSTEM

- We are using retinex (retina + cortex) model with which is said to be a best algorithm for image enhancement up to now.
- No need of any training data.
- MSRCR enhances all edges and colour of the image.

VI. IMPLEMENTATION

Implementation of our system can be explained through the below diagrams.

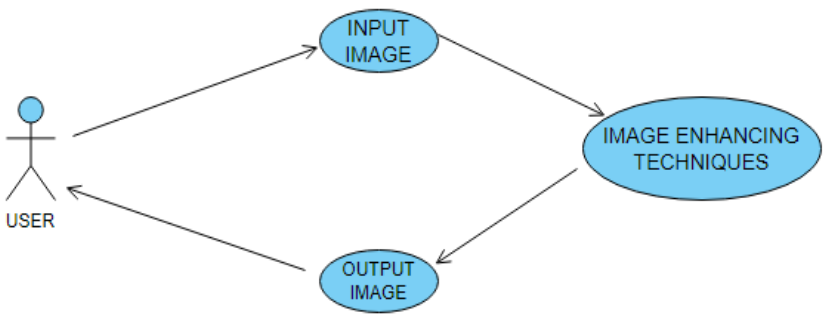

Figure-2: Use case Diagram

The above is the use case diagram to explain the important modules of our project.

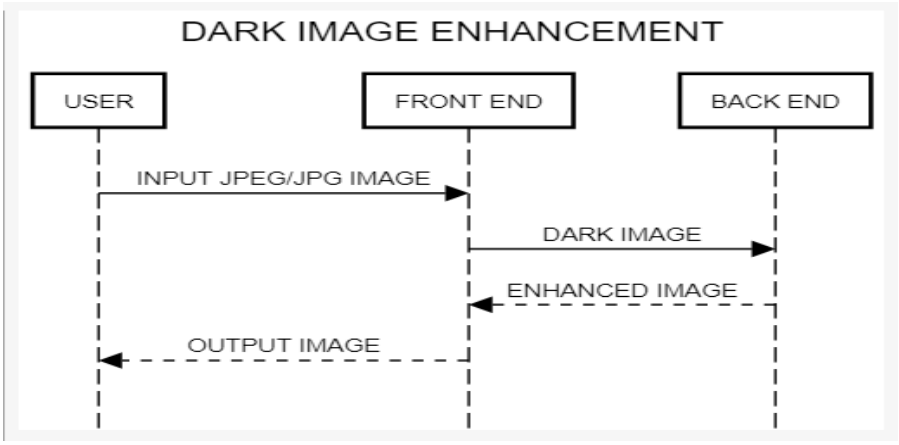

Figure-3: Sequence Diagram

The above is the sequence diagram to explain the flow of our project.

Modules

1) Input Image: Low light picture which need to be enhanced.
2) Pre-Processing: Includes Blurring the input image.
3) Image Enhancement: Operations to perform enhancement.
4) Output Image: Enhanced Image

VII. MODELLING

The below diagram illustrates how our system will work in real time by indicating the input images that it is taking and the output images that it will give to the user through an user interface.

Here you can see, it gives three outputs at a time which are corresponding to three algorithms.

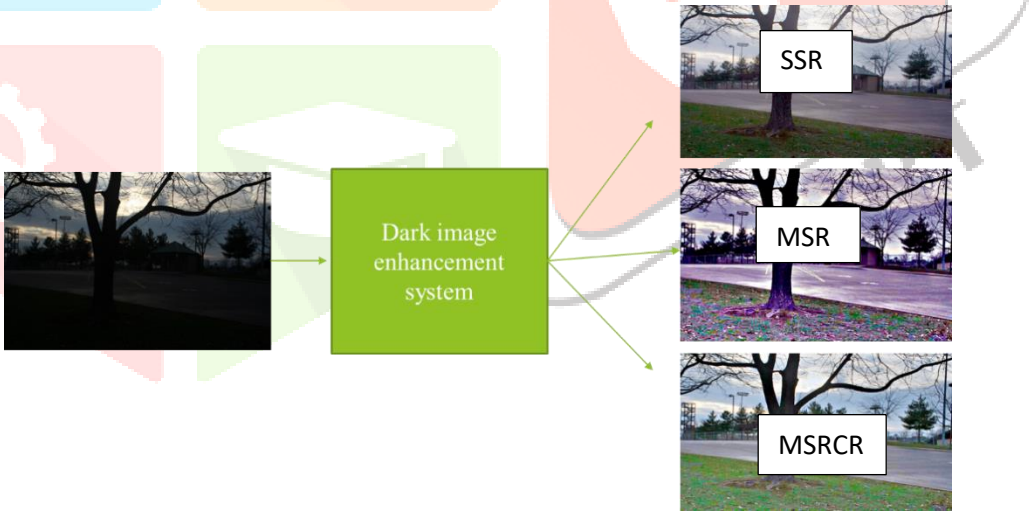

Figure-4: Visual Representation of Dark Image Enhancement

VIII. RESULTS

We take many images which are taken in low light as input to validate our system accuracy, through those tests we will find it works in an appreciable way. It takes input image at backend from the front end which is given by the user (accepts only jpg format). Then first it will Pre-process (Blurring) the image using Gaussian Blur Filter. Here we are using log transformation to expand low pixel valued area in input image. By selecting the type of enhancement technique by the user, user able to see the enhanced image.

IX.CONCLUSION

Here we first used single scale retinex but that method do not enhances the edges or corners of the image and the output image produced are not enhanced at edges, so the edges are still dark and not visible. So next here we used

multi scale retinex and by using that the corners of images are also enhanced, and the output image is fully enhanced but the colours of the image are vanished by applying multi scale retinex so the output image is visible in the form of a gray scale image. So here we used multi scale retinex with colour restoration and this enhances the colours of an image by balancing the colours and the colours of the output image are clearly visible and the output of the multi scale retinex with colour restoration is fully enhanced and clearly visible to the user.

In worldwide Retinex strategies, light is extricated by smoothing the first picture through certain sorts of Gauss mask, and how to remove illumination precisely is a key issue. In light of the point that the foundations of picture grouping in video's nearby casings are normally comparative and firmly related, we propose a superior Retinex calculation. In the strategy, the enlightenment of some neighboring casing pictures is melded by greatest technique, and utilized as these nearby edge pictures' uniform light. Analyze shows that more exact back grounds are procured, and more great upgrade execution are accomplished.

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