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Fog Removal in an Image

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Abstract:

The visibility of images captured in outdoor scenes is degraded due to the presence of water, haze, fog and so on.These causes failure in computer vision applications.Visibility restoration techniques are developed and play an crucial role in many computer vision applications that operate in various climate.However, removing haze from one image with a multiplex structure and color distortion may be a difficult task for visibility restoration techniques.

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I. INTRODUCTION:

Haze is thick cloud of tiny water droplets that present in the atmosphere.These haze causes many failures in the computer vision applications.Images that we are captured in foggy climate causes degraded images.In this paper visibility restoration technique is implemented to enhance the degraded images.Restoration means to restore an image that is not looking good due to some distortion.image restoration is an objective process,that based on mathematical and probabilistic models of image degradation.

II. PROPOSED METHOD:

In this paper, we use pre-processing,segmentation and classification methods to enhance the degraded images.

PREPROCESSING:

The image sequence obtained for different d values of noise added to the images. The next step ofimage preprocessing is normalization.Normalization has two ways - normalization of the entire image to the range of brightness values from 0 to 1, normalization of individual columns and rows to the range of brightness values from 0 to 1.

DEPTH ESTIMATION:

Depth estimation module uses median filter to preserve edge information .It also used to avoid halo effects and insufficient estimation of transmission map.It avoid generation of block artifacts that created during lossy compression of an image .It mainly based on dark channel prior technique.It gives refined and enhanced transmission.

COLOR ANALYSIS MODULE:

To determine whether or not the average the intensities of each color channel are equal.It is based on color histogram.It determines coherent and incoherent images.

VISIBILITY RESTORATION MODULE:

It is used to enhance the color map of the images .It has dynamic range of intensity values ans uses limited no.of bit planes.It gives brightness,contrast and color to the images.

FLOW DIAGRAM:
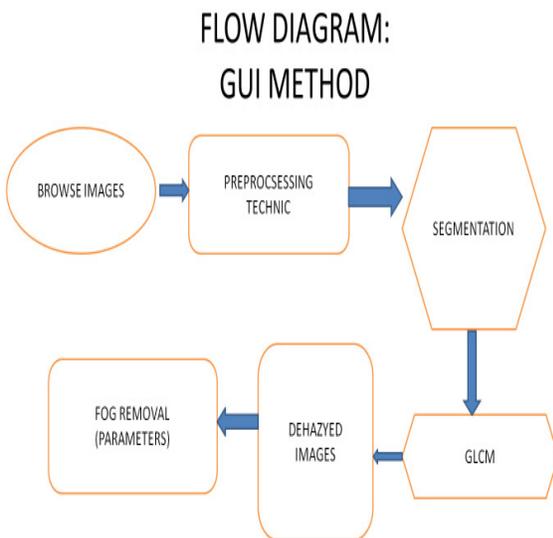
SEGMENTATION:

Segmentation subdivides an image into its constituent regions or objects.It stop when the region of interest in application have been isolated.It has two types -discontinuity and similarity.Discontinuity means partitioning an image supported abrupt changes in intensity like edges in a picture . Similarity means partitioning an image into similar region .

CLASSIFICATION:

It refers to the labeling of images into one of a no. of predefined categories .It includes object detection, image sensor ,feature extraction etc.,

Classification divides the images into groups.

RELATED WORKS:

Rajesh kumar Aggarwal [1] "Study of single image fog removal techniques in low visibility foggy images" in the year 2017,In this paper, they study single image haze removal techniques on outdoor images for visibility enhancement in foggy weather conditions.Haze removal techniques based on dark prior model have used different filters for estimating the transmission.They have studied effect of using different filters along side the elemental mean and gaussian filters within the visibility enhancement in foggy conditions.

Sunayana Suryawansh [2]"Fog correction using exponential contrast restoration" in the year 2018, In this paper ,the implementation is step ahead for the current image processing applications which capture degraded contrast and establish error prone images in fog condition.Long distance images has low visibility.The variation in fog density with distance is responsible for atmospheric veil factor.The implementation includes the single image processing for quantifiable and approximate calculations to construct fog free images with the use of atmospheric veil to rebuild the contrast of the images.

WORK FLOW:

Input image: Input image is captured by digital camera.

Input Gray scale: Input image has to be converted to 8-bit gray scale value is calculated. And after that Gray scale is converted into binary image by threshold method.

Noise reduction: Median filtering technique to reduce the noise in the images.

Plate Localization: MATLAB toolbox function provides a function called region props. It measures a set of properties for each labeled region in the matrix. It uses bounding box to measure the properties of the image region. After connecting components, the region will be extracting from the input image.

Segmentation: To get individual character and number image by using vertical and horizontal scanning method.
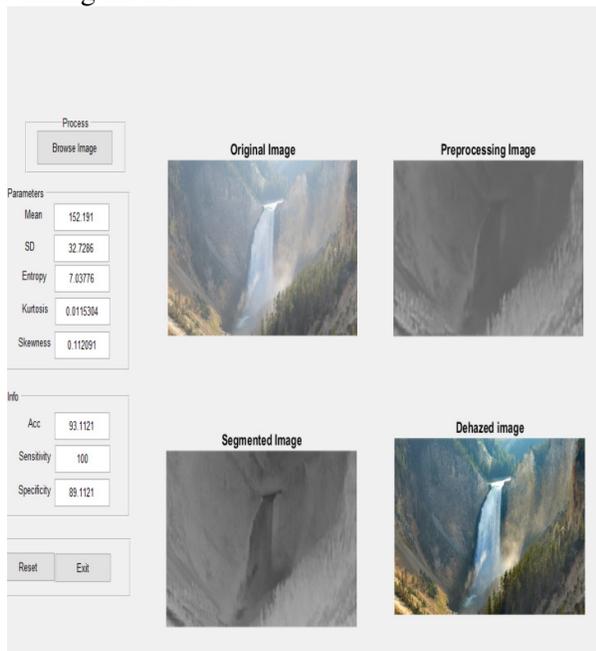
SOFTWARE REQUIREMENTS:

MATLAB 2019(a):
MATLAB may be a scientific programing language and provides strong mathematical and numerical support for the implementation of advanced algorithms. It is for this reason that MATLAB is widely employed by the image processing and computer vision community. New algorithms are very likely to be implemented first in MATLAB, indeed they'll only be available in MATLAB.

SYSTEM REQUIREMENTS:

Windows 7 (or) higher,
64 bit operating system
Disk Space
2 GB for MATLAB only,
4–8 GB for a typical installation,
Minimum 2GB RAM needed,
No specific graphic cards required.

CONCLUSION:

In this paper,we analyse several techniques and proposed a three methodologies .1.Depth Estimation is used estimate the depth from camera point to image.It has two properties used to preserve edge information and transmission map.2.Color Analysis Module represent the purity of input image and color distortion problem and express the various range of RGB images.3.Visibility Restoration Techniques used to color correlated problems and used to remove haze and then provide a haze free images.The overall consideration is to remove the fog in an image and give a fog free images.

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