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ROBUST AND EFFICIENT HAZE REMOVAL IN IMAGE AND SPEEED CONTROL OF VEHICLE BASED ON DEPTH OF HAZE

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Abstract - "Haze" generally indicates slight a darkening of the lower atmosphere, typically caused by fine suspended particles with the combination of airlight and attenuation process, as a result it increases the whiteness of the image and reduces the visibility and hence affects the computer vision algorithms such as surveillance, location tracking etc. To overcome this issues we have typical tool/technique called-Haze which helps us to eliminate the bad effects on images and improves the performances of image/video quality in the hazy weather

I.INTRODUCTION

The purpose of image processing is to understand and recognize the data from the image pattern. In some cases image may get corrupted either by dust particles, smoke, snow, haze, and fog. These poor weather conditions will effect the image which were captured and reduce the image clarity. Because Haze is a common natural phenomenon in our daily life caused by the atmospheric absorption and scattering. Moreover image may get blurred or even it may be squeezed by manual when the distance between the object and the camera is too long compared to focusing length of the camera lens.

Example,When haze appears, we will try to capture the image by adjusting the camera setting from low contrast and lack of clarity. The dehazing technique can eliminate the bad effect of haze on images and enhance the performances of image/video processing algorithm in the hazy weather. The present project work is to enhance the visibility, saturation, contrast and reduce the noise in a foggy image.

We propose a method that uses single frame for enhancing foggy images using multilevel transmission map. The method is fast and free from noise or artifacts that generally arise in such enhancement techniques. Our method benefits much from an exploration on the inherent boundary constraint on the transmission function. This constraint, combined with contextual regularization, is modeled into an optimization problem to estimate the unknown scene transmission. In final stage, the well-known Speeded Up Robust Feature Transform (SURF) used to compare the results.

II. EXISTING METHOD:

A color Attenuation Prior has been used to get haze-free image possesses more evident degrees of contrast than does a hazy image. The restoration results produced by the approach usually appear unnatural or unrealistic. The initial transmission estimated properly based on latent region-segmentation and refine the estimated initial transmission by an objective function with a novel weighted L1-norm regularisation term. The half-quadratic splitting minimization method is employed to solve this optimisation problem. They also define an evaluation function to estimate the reliable global atmospheric light. With the refined transmission map and atmospheric light they recover the haze-free image by the haze imaging model.

Disadvantages:

Original Scene will be removed while dehazing.

Saturated images are produced while removing the haze

III. LITERATURE SURVEY

[1] *Bingquan Huo and FenglingYin*," Image Dehazing with Dark Channel Prior and Novel Estimation Model",2015

Single Image Dehazing technology is widely needed in many fields. In order to solve the problem, we propose an improved and modified framework for estimating the optical transmission t in hazy scenes in a given single input image. As a result, we could estimate the atmospheric light A better and avoid the important drawback of artifacts phenomenon. At last, through this effective estimation to t and A, the scene visibility is largely increased and the haze-free scene contrasts can be better recovered. The experimental analysis

shows that compared with other state-of-the-art algorithms, our proposed algorithm can provide promising results to dark channel prior and get corresponding reliable estimation value t with the advantage of minimal halo artifacts and fewer unreal details. Our method is more effective and robust.

[2] *Shriya Sharma ,Amritsar Sakshi*,"Improved Haze Removal of Underwater Images using Particle Swarm Optimization",2015

The main objective of fog removal algorithm is to estimate the airlight map for the given image and then perform the necessary operations on the image in order to overcome the fog in the image and enhance the quality of the image. The dark channel prior method of fog removal is more suitable and time-saving in real-time systems. In this paper, an efficient approach for fog removal of foggy images based on the combination of dark channel prior and genetic algorithm is presented. It is found that the proposed method is more suitable for obtaining the better quality of the image than the most of the existing methods.

[3] *Dr. Vinod Shokeen1 , Sumit Bhardwaj2 , Neeraj Mishra*,"A Study of Various Haze Removal Techniques for Image Processing",2016

This paper presents a study on the different haze removal techniques. Haze brings trouble to many computer vision/graphics applications as it diminishes the visibility of the scene. Haze is formed due to the two fundamental phenomena that are attenuation and the air light. Attenuation reduces the contrast and air light increases the whiteness in the scene. Haze removal techniques recover the color and contrast of the scene. These techniques are widely used in many applications such as outdoor surveillance, object detection, consumer electronics etc. The overall objective of this paper is to explore the various methods for efficiently removing the haze from digital images. This paper ends up with the short comings of the existing met

[4] *Li-Wei Kang, Cheng-Yang Lin,*"IMAGE HAZE REMOVAL VIA HAZE DENSITY ANALYSIS BASED ON PIXEL-BASED DARK CHANNEL PRIOR",2012

Images/videos of outdoor scenes are usually degraded by the turbid medium in the atmosphere. In this paper, a novel single image-based dehazing framework is proposed to remove haze effects from image/video, where we propose two novel image priors, called the pixel-based dark channel prior and the pixel-based bright channel prior. Based on the two priors with the haze imaging model, we propose to accurately estimate the atmospheric light via haze density analysis. We can then accurately estimate the transmission map, followed by refining it via the bilateral filter. As a result, high quality haze-free image can be recovered with lower computational complexity, which can be naturally extended to video dehazing.

[5]*Zhu, Member, IEEE, JiamingMai, Ling Shao, Senior Member*,"A Fast Single Image Haze Removal Algorithm Using Color Attenuation PriorQingsong",IEEE 2015

Single image haze removal has been a challenging problem due to its ill-posed nature. In this paper, we propose a simple but powerful color attenuation prior for haze removal from a single input hazy image. By creating a linear model for modeling the scene depth of the hazy image under this novel prior and learning the parameters of the model with a supervised learning method, the depth information can be well recovered. With the depth map of the hazy image, it can be easily estimate the transmission and restore the scene radiance via the atmospheric scattering model, and thus effectively remove the haze from a single image. Experimental results show that the proposed approach outperforms state-of-the-art haze removal algorithms in terms of both efficiency and the dehazing effect.

[6]*Sandeep Garg , Maninder Kaur*,"Real Time Haze Removal using Histogram Processing",

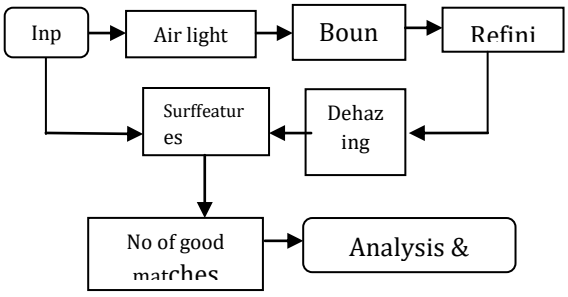
The haze removal algorithm using dark channel in existing base paper work has been observed to achieve great haze removal effect, but this process is too complex that attributes too much processing time and complexity in the algorithm. The complex algorithm makes its limited applications/uses in real time image processing task. Further, the up sampling and down sampling methods are of simple linear function of pixel intensity and does not preserve the edge contents of the scene. This deteriorates the algorithm performance in terms of entropy of the scene

IV. PROPOSED SYSTEM

This is an enhanced technique which is used to dehaze based on airlight calculation .this method uses transmission maps block of different size of cross bilateral filter for better removal of and producing a clear cut edge image .in real time haze removal is a challenge ,this technique used to remove haze easily

An algorithm is proposed which will repair the transmission map dynamically and will produce a average and satistyable visibility .this technique mainly works on depth of the transmission map .our contribution which will enable us to provide a fine image .

As a final result speeded up robust feature transmission (SURF) uses to compare results



Dehazing with the Multi-scale Network :
Atmospheric light estimation: we need to estimate the atmospheric light A from transmission map to recover a clear image

From hazy image formation

I(x)= A when

F(x)->0

Image of depth,

d(x) → ∞ (arrange is for)

Thus

A=0.1% darkest pixels

Haze removal: After estimating a & t(x) we need to recover

$$J(x) = \frac{I(x) - A}{\max\{0.1, t(x)\}} + A.$$

haze free image J(x) is recovered ...

V.REQUIREMENTS

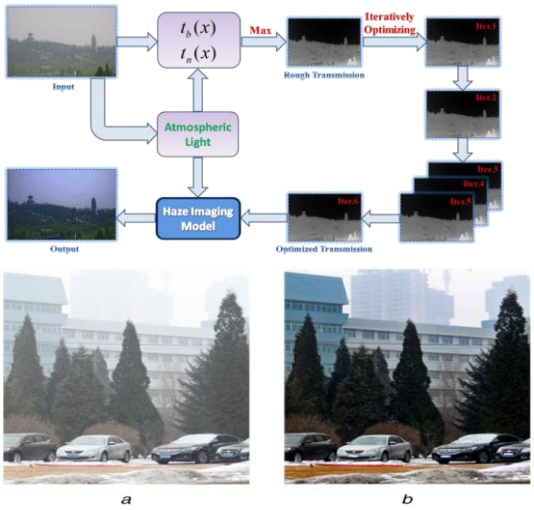
SOFTWARE REQUIREMENTS

1. Tool : Matlab 2014a
2. Toolbox : Image Processing

HARDWARE REQUIREMENTS

1. SYSTEM : Pentium IV 2.4 GHz
2. HARD DISK : 40 GB
3. RAM : 2 GB

VI.EXAMPLE RESULTS



a b

ADVANTAGES

without any change in original scene Fog is removed

Our method can recover rich image other than haze regions.]

Our method dehazes successfully in these types of images.

Haze qarticle in our result are quite small

Used for the driver assist

VII. CONCLUSIONS

As a result we have proposed an efficient single image dehazing method .from some lower bound of transmission is service lower bound of transmission is service used to estimate initial transmission in non brght overestimate region and also in bright region transmission are under estimate

This can be used for intensity similarity and spatial similarity weight function in our technique our region halo articrafts very sufficiently optimization problem is solved by half quadratic splitting minimization method

In these conditions, for we use colour differences to replace depth differences which cannot be achieved directly, our method cannot reliably distinguish which pixel is heavily haze-contaminated and which is not. Then the method may process these objects as the dense haze and give these pixels very low transmission. Consequently, the contrast of pixels in these regions is excessively and inaccurately enhanced. The processing speed of our algorithm also should be accelerated for real-time dehazing

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