ISSN: 2278-4632
Vol-11 Issue-01 2021

HAZE REMOVAL BY USING DEHAZING ALGORITHM BASED ON STATIC AND NON-STATIC ANALYSIS APPLICATION IN NAVIGATION SYSTEM

Dr.V.S.R.Kumari
Principal (Professor)
Affiliated Department of Electronics and Communication Engineering
Sri mittapalli institute of technology for women /JNTUKakinada

Srinivasa Rao Chevala
Assistant Professor
Affiliated Department of Electronics and Communication Engineering
Sri mittapalli institute of technology for women /JNTUKakinada

Bollimunta Meena
Assistant Professor
Affiliated Department of Electronics and Communication Engineering
Sri mittapalli institute of technology for women /JNTUKakinada

ABSTRACT: Most of the outdoor images suffer from contrast degradation caused by fog and haze. Two statistical frame works have been proposed in recent years that exploit local(dark channel prior) and non-local (haze-lines) characteristics of hazy images for the estimation of scene configurations and the restoration of scene albe do. Both frame works show intrinsic limitations due to the basic assumptions they relyon. In this paper we pro- pose a novel dehazing method that combines the advantages of local and non-local dehazing methods. Exploiting their complementary statistical properties, we use the local features to regulate the estimation of non-local haze-lines for a better final restoration at challenging regions. Both quantitative and qualitative results validate the effectiveness of our proposed method over state-of-the-art frameworks. Both subjective evaluation and objective assessments indicate that the proposed method achieves a better performance than the state-of-the-art methods.

Index Terms–non-local, dark channel prior, hazeline, White-balancing.

1. INTRODUCTION

With the fast advance of technologies and the prevalence of imaging devices, billions of digital images are being created every day. Due to undesirable light source, unfavorable weather or failure of the imaging device itself, the contrast and tone of the captured image may not always be satisfactory. In fact, image enhancement algorithms have already been widely applied in imaging devices for tone mapping. For example, in a typical digital camera, the CCD (Charge Coupled Device) or CMOS (Complementary Metal Oxide Semiconductor) array receives the photons passing through lens and then the charge levels are transformed to the original image. Usually, the original image is stored in raw format, with a bit length too big for normal displays.

In this project the image enhancement approach adopts a two step strategy,

- White-balancing

ISSN: 2278-4632
Vol-11 Issue-01 2021

- IDeRS

Combining white-balancing and image fusion, to improve underwater image without restoring. In this approach white-balancing aims at compensating for color cast caused by the selective absorption of colors with depth and image fusion is considered to enhance the edges of the image. Here, we aim for a simple and fast approach that is able to increase the scene visibility in a wide range of underwater images.

White-Balancing

Because of the undesirable illuminance or the physical limitations of inexpensive imaging sensors, the captured image may carry obvious color bias. To calibrate the color bias of image, we need to estimate the value of light source, the problem of which called color constancy. Using a suitable physical imaging model, one can get an approximated illuminance, and then a linear transform can be applied to map the original image into an ideal one.

White balance determines color rendition of digital photography's, here it is a typical example for the effect of different white balance settings show in the below Fig White-balance is an aspect of photography that many digital camera owners don't understand, so for those of you have been avoiding white balancing.

Adjustment of White Balancing

Different digital cameras have different ways of adjusting white balance. Many digital cameras have automatic and semi-automatic modes to help you make the adjustments. White balance basically means color balance. It is a function which gives the camera a reference to "true white". It tells the camera what the color white looks like, so the camera will record it correctly.

Related work

Topic: "Color constancy using natural image statistics and scene semantics. Existing shading consistency techniques are altogether founded on explicit presumptions, for example, the spatial and ghostly attributes of pictures. As a result, no calculation can be considered as all inclusive. Notwithstanding, with the enormous assortment of accessible techniques, the inquiry is the means by which to choose the strategy that performs best for a particular picture. To accomplish choice and consolidating of shading steadiness calculations, in this paper regular picture measurements are utilized to recognize the most significant attributes of shading pictures. To catch the picture attributes, the Weibull parameterization (e.g., grain size and complexity) is utilized. It is demonstrated that the Weibull parameterization is identified with the picture ascribes to which the utilized shading steadiness techniques are touchy. A MoG-classifier is utilized to become familiar with the relationship and weighting between the Weibull-parameters and the picture properties (number of edges, measure of surface, and SNR). The yield of the classifier is the determination of the best performing shading steadiness technique for a specific picture. On an informational index comprising of in excess of 11,000 pictures, an expansion in shading steadiness execution up to 20 percent (middle precise mistake) can be acquired contrasted with the best-performing single calculation. Further, it is appeared for certain scene classifications, one explicit shading steadiness calculation can be utilized rather than the classifier thinking about a few calculations.

3. EXISTING SYSTEM:

- Image enhancement

ISSN: 2278-4632
Vol-11 Issue-01 2021

- Wavelet method

3.2.1. Basic Steps of Image Enhancement

The basic steps of image enhancement, if we are taking the any input image, the image is then specify application pre-processing method will be performed on those image after this method the image quality is increased.

Input Image: In this first an image will be taken as an input. These images can be medical images, blur images, remote sensing images machine vision, the military applications etc.

Perform Pre-processing on the Image:

Images that will be taken as input can be blur image or noisy image so the various pre-processing methods will be performed on those images before applying enhancement technique.

Applying Domain Techniques: After applying pre-processing method on input images then image quality will be enhanced by using Image enhancement domain techniques such as spatial or transformation.

Output Enhanced Image: In this the output image will be get which is an enhanced image.

Wavelets Method

The Wavelet change is a change of this sort. It gives the time-recurrence portrayal. (There are different changes which give this data as well, for example, brief time Fourier change, Wigner dispersions, and so on.)

As a rule a specific ghostly segment happening at any moment can be specifically compelling. In these cases it might be helpful to know the time interims these specific otherworldly segments happen. For instance, in EEGs, the idleness of an occasion related potential is specifically compelling (Event-related potential is the reaction of the cerebrum to a particular improvement like blaze light, the inactivity of this reaction is the measure of time passed between the beginning of the upgrade and the reaction).

Wavelet change is equipped for giving the time and recurrence data at the same time, consequently giving a period recurrence portrayal of the picture. DWT utilizes two arrangements of capacities, called scaling capacities and wavelet capacities, which are related with low pass and high pass channels, separately. The disintegration of the picture into various recurrence groups is essentially gotten by progressive high pass and low pass sifting of the time space picture. The first picture x[n] is first gone through a half band high pass channel g[n] and a low pass channel h[n]. After the sifting, half of the examples can be dispensed with as per the Nyquist's standard, since the picture currently has a most noteworthy recurrence of □/2 radians rather than □ . The picture can consequently be sub sampled by 2, basically by disposing of each other example. This comprises one degree of decay and can numerically be communicated as pursues:

$$y_{high}[k] = \sum_{n} x[n] \cdot g[2k - n]$$

$$y_{low}[k] = \sum_{n} x[n] \cdot h[2k - n]$$

where y high[k] and y low[k] are the yields of the high pass and low pass channels, individually, in the wake of sub sampling by 2.

The recreation for this situation is extremely simple since half band channels structure orthonormal bases. The above method is followed backward request for the remaking. The pictures at each level are up sampled by two, went through the combination channels g'[n], and h'[n] (high pass and low pass, individually), and after that additional.

3. PROPOSED SYSTEM:

Recently, the processing of single hazy image has a significant progress. Some methods based on polarization have been developed proposed a single image dehazing method based on adaptive wavelet fusion, which could preserve the most discriminate scene depth. developed a polarization dehazing method by processing the low spatial frequency parts and the high spatial frequency parts separately. Regarding the image fusion method proposed a single image dehazing approach based on a multi scale pyramid fusion scheme. In addition, with the development of deep learning, some researchers employed convolutional neural networks for single hazy image processing .created a multi scale convolutional neural network model to learn the transmission map. After that present a truly end-to-end network, combining the transmission map with the atmospheric light to produce the results. Nevertheless, these methods are complex and time consuming

Haze physical model

The physical model for NID is depicted as [15]: $I(x) = J(x) \cdot t(x) + A(1 - t(x))$, (1) where x speaks to spatial directions, I is cloudy picture, J is the scene brilliance. An is barometrical light, for example the light force at limitless separation (known as the cloudiness misty area), which is ordinarily thought to be a worldwide consistent. $t(x) \in [0, 1]$ is the transmission map, portraying the segment of light which can achieve the camera without be dispersed. In view of the Lambert Beer law [31, 35] for straightforward items, the transmission guide is given by $t(x) = e^{-\beta(\lambda,x)d(x)}$, (2) where d(x) speaks to scene profundity, and λ is the wavelength. The physical cloudiness model of RSI still complies with (1). Be that as it may, environmental light and transmission guide are translated to appear as something else. The barometrical light. A characteristic picture is caught on the ground where the camera focuses at the separation. It for the most part contains cloudiness murky district (usually, the sky area). At that point the air light A can be registered from the most splendid pixel [40], or a segment of the most brilliant pixels [15]. A RSI is caught by the camera on board satellite where the camera focuses descending the ground, so it normally has no murkiness murky locale. The brilliant pixels ordinarily have a place with the reflect light of articles' surface, which can't be utilized to ascertain climatic light A. Thus, An estimation ought to be autonomous of murkiness obscure for RSID. Subsequent to assessing the condition of expressions of the human experience, including the DCP [15], shading line earlier [12], daze dehazing [2], DehazeNet [6] and murkiness line earlier [3, 4], the fog line earlier is at last chosen to evaluate An in this work. Fog line earlier cases that pixels' forces of articles with comparable hues structure lines in RGB space under cloudiness. These lines converge at the environmental light shading. Utilizing Hough change, where the point with the most noteworthy vote is thought to be the barometrical light shading.

ITERATIVE DEHAZING FOR REMOTE SENSING IMAGE (IDERS)

Based on the discussion about transmission map estimation and atmospheric light estimation in Section 3, the IDeRS are presented in detail in this section.

where the notation represents setting the value in the left side of the equation to be the value of the right side

ISSN: 2278-4632
Vol-11 Issue-01 2021

and is the learning rate, which determines the efficiency of the gradient descent algorithm. If learning rate is too small, we would need a large number of steps to reach the global minimum. Conversely, the cost function is unable to converge when learning rate is too large. Thus, it is significant to choose the right learning rate, and the calculation of the learning rate is shown as follows:

$$\alpha = \alpha_S * \alpha_D^{(global-step)/(decay-step)}$$

where is initial learning rate, indicates the attenuation rate of each round of learning, represents the current number of learning steps which is equivalent to how many times we put batch into the learner, and is the number of steps per round of learning which is equal to the total number of samples divided by the size of each batch.

5. DESIGN AND IMPLEMENTATION

we prepared the training data based on the method proposed in assumed that the image content is independent of scene depth or media transmission, and depth is locally constant. We illustrated the procedure of generating the training data in Fig. At first, we generated a random depth map with equal size for each unblemished image, and the pixel values in the synthetic depth map were extracted from the standard uniform distribution in the open interval (0, 1).Here the results are executed in MATLAB software .Image processing toolbox is used to perform analysis and algorithm development which perform image segmentation, image enhancement and noise reduction.

FIG: input image

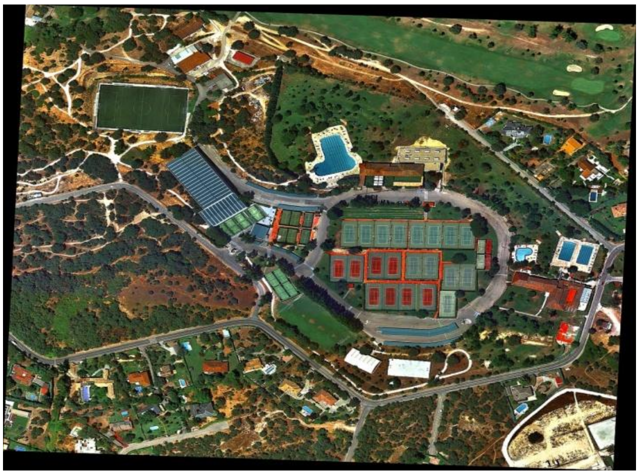

Fig: output image

7. CONCLUSION :

In this paper, a novel and effective dehazing algorithm was developed to achieve single remote sensing image haze removal. A linear regression model with multiple variables is established and the gradient descent method is applied to the coefficients of the linear model. Then a hazy image accurate transmission map is obtained. In addition, we proposed a more valid method to estimate the atmospheric light, which can restrain the influence of highlight areas. Compared with the traditional methods, the experimental results demonstrate that the developed algorithm has a good performance in thin haze removal and color fidelity remaining. Both subjective evaluation and objective assessments indicate that the proposed method can recover a haze-free remote sensing image with good visual effect and high quality. Furthermore, our future research will turn to the removal of thick haze.

8. FUTURE SCOPE:

Our future scope is focused on patch segmentation fusion. An image is first split into small patches and the segmentation is performed on each patch. Here, sharpening method is used to smooth the edges to increase

ISSN: 2278-4632
Vol-11 Issue-01 2021

the visibility of the underwater image in wide range. Our future scope is focused on patch segmentation.

REFERENCES:

[1]A. Ortiz, M. Simó, and G. Oliver, “A vision system for an underwater cable tracker,” Mach. Vis. Appl., vol. 13, pp. 129–140, Jul. 2002.

[2]A. Olmos and E. Trucco, “Detecting man-made objects in unconstrained subsea videos,” in Proc. BMVC, Sep. 2002, pp. 1–10.

[3]S. G. Narasimhan and S. K. Nayar, “Contrast restoration of weather degraded images,” IEEE Trans. Pattern Anal. Mach. Learn., vol. 25, no. 6, pp. 713–724, Jun. 2003.

[4]C. H. Mazel, “In situ measurement of reflectance and fluorescence spectra to support hyperspectral remote sensing and marine biology research,” in Proc. IEEE OCEANS, Sep. 2006, pp. 1–4.

[5]M. D. Kocak, F. R. Dalgleish, M. F. Caimi, and Y. Y. Schechner, “A focus on recent developments and trends in underwater imaging,” Marine Technol. Soc. J., vol. 42, no. 1, pp. 52–67, 2008.

[6]B. A. Levedahl and L. Silverberg, “Control of underwater vehicles in full unsteady flow,” IEEE J. Ocean. Eng., vol. 34, no. 4, pp. 656–668, Oct. 2009.

[7]R. Schettini and S. Corchs, “Underwater image processing: state of the art of restoration and image enhancement methods,” EURASIP J. Adv. Signal Process., vol. 2010, Dec. 2010, Art. no. 746052.