

Identification of Measles Rash spots by Image Contrast Enhancement

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Abstract: Measles is classified as contagious and fatal disease in both developing and poor countries. In developing countries, the number of deaths reaches more than 100.000 each year. After decade of successful vaccination for measles in 2000, US declared that the eliminated of measles. As result, the heath care and the public have never seen any measles states. Unfortunately, measles came back in US in 2019 with more than 1000 confirmed cases. To give our assisting in diagnosing measles, we studied a color image from the Measles Rash patient's skin in an aim to create a computer or phone application in future and then we identified the token image by using matlab simulation codes. Our method shows better contract enhancement and the clear visual image of low contrast measles images has been achieved.

Keywords: (Medical imaging, Measles Rash, Digital Image Processing, Image Enhancement, Contrast Images)

Introduction

Several medical imaging forms have been applied for enhancing such as eyes, bones, heart, and brain...etc[1]. Therefore, our focus in this research is enhancing Measles Rash images for its negative effect. Here, brief information about why we choosing this disease will be noted. Measles is strong viral reparatory illness [2] [3]. It is serious contagion disease [7]. Measles Rash illness symptom starts in appearing three to five days after high fever, running nose, water eyes and cough. These symptom seems mimic other illnesses such as normal flu, but afret three to five days symptoms begin, Measles rash appears as a flat dray red spots which it starts from the up of the head until down to the feet. These symptoms can be dangerous for chiders more than adults. Measles is very danger contagion diseases that end to death before starting measles vaccination program [7]. Globally, Measels cases increased with more than 500,000 confirmed cases of measles and an estimated of 140,000 cases resulted in death [8]. The World Health Organization comes to

terms that people can be protected by giving the vaccine to reduce the harmful of measles [3].

The purpose of this research is reducing the infection of measles by preventing patients of spreading of measles disease among of people. Our objective is processing Measles Rash images which are received from the patients because the received images may not have a good quality. Measles Rash images should have high end of contrast because it is a small spots on a skin as shown in fig.1.



Fig. 1: Image of Measles's Rash [6]

Method

The proposed method as show in the block diagram fig.2 was processing the given measles rash color image by histogram algorithm techniques after two steps.

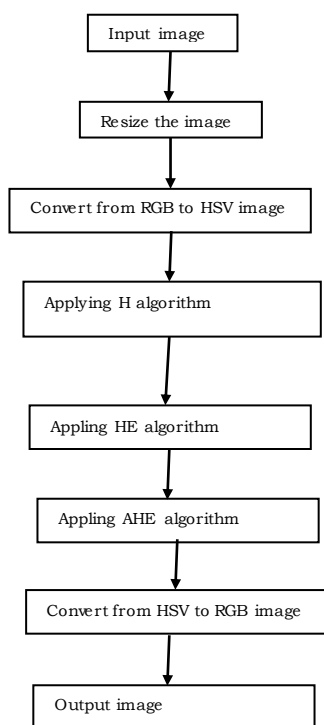


Fig. 2: Image of Measles’s Rash patient and it’s histogram

First step, the measles rash color image was resized to make sure that the image has the same number of rows and columns.

Second step, the measles rash color image has been converted from Red, black and blue (RGB) system to hue, saturation, and value (HSV) system for appearing image color under light. Now, measles rash resized and converted image passed by three histogram algorithms techniques which are H, HE and AHE in order.

Generally, histogram defined as a graphical representation of the image which has X and Y axis .Where X axis represents the gray level of brightness to darkness and Y axis represents the pixels’ number.

1- Histogram

Fig.2 shows Measles’s rash image as revised from the patient and its histogram. The histogram provides clear information regarding the contrast of the image in darkness side. However, we cannot get any information from the patient’s image about the disease as we supposed to see.

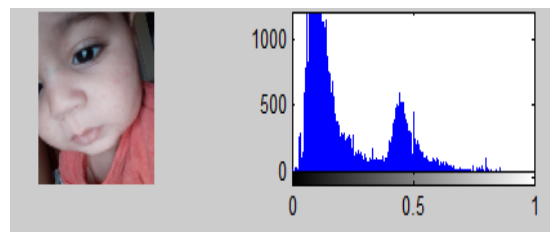


Fig. 3: Image of Measles’s Rash patient and it’s histogram

2- Histogram Equalization

To increase the contrast in the image, HE has been used. HE spread the intensity values. Also, HE stretch out rang of intensity image [4] [5]. HE technique changed the distribution of pixel values and compress the dynamic range of image, thus the image archived increasing in its contrast as shown in Fig 3.

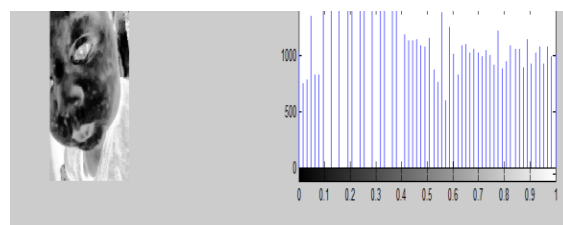


Fig. 4: Measles’s Rash patient image and it’s HE

3- Adaptive Histogram Equalization

AHE differs from the previous histogram in way that AHE computes several histograms, each identical to a distinct part of the image. After that the parts can be used to redistribute the lightness pixels of the image. Therefore, the local contrast and enhancing the details of the edges in each region of the image.

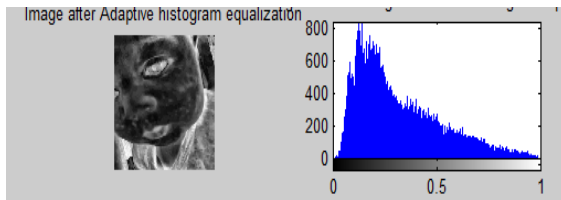


Fig. 5: Image of Measles's Rash patient and its AHE

Results and Discussion

In this paper, we have identified the harmful of Measles Rash disease. We noted that vaccinations are very crucial in protecting people specially children against preventable disease. We worked on medical image processing enhancement be effective to against spread the disease among people. The simulation was perform based on MATLAB2013a. Our implantation of contrasting the image by histogram algorithm technique gave an excellent result. Several of image enhancement techniques and algorithms such as resize, convert, Histogram (H), Histogram Equalization (HE), and Adaptive Histogram Equalization (AHE) were proposed to get a good contrast, and the function of H was giving information of colour level and clarifies the contrast of the image form brightness or darkness as shown in fig 3. After that, HE stretch and spread the intensity of the image to increase the contrast as shown in fig 4. Additionally, AHE used to redistribute the lightness pixels of the image and clarify the local edges of the image. The specific goal was improve the image contract. AHE is very effective at enhancing contrast of Measles rash image as shown in fig 5.

Conclusion

Our result of enhance the measles rash image as shown in fig 6 were privilege schussed. The figure shows that the small red tiny spots are very clear on the patient's face. So the doctors noted his prescription according to the output image and other indication. The aim of this research was help medical care to uses more

and more technology to save human life. We get our objective from this paper and we are looking for create a computer and phone application to could serve as a powerful tool in the diagnosis of the measles disease.

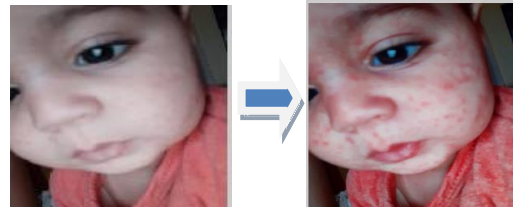


Fig. 6: Image of Measles's Rash patient image before and after enhancement

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