

Recognition of Dermatological Disease Area for Identification of Disease

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Abstract- Skin diseases are common problem to everyone and different types of skin allergies are becoming more and more common. Many of these diseases are very harmful and dangerous, particularly if not treated at an initial stage. In this article we find the area which affected by dermatological disease, which is useful identify the diseases as well as find the stages of diseases. For extraction of area which is feature of image we have used various types of image processing and image segmentation algorithm.

Keywords – Skin diseases, image processing, image segmentation, feature extraction.

I. INTRODUCTION

Skin diseases in everywhere tend to be prevalent due to climatic as well as the living situation of the vast majority of people. Skin diseases not only affect the skin but also it has a huge impact on person day to day life, lead to depression, restrict their movement, crush self-confidence, and even relationships. So it is needed to take skin disease seriously. Today, almost all the sectors and in other fields get the aid of computerized systems. In the field of medical science there is a great demand for computer-aided tools to facilitate many tasks. Many things that were done manually using traditional equipment have been replaced with automated systems. Modern medical science is looking for solution which could assist the doctors with any aspect of work using the new technology.

Here we use various image processing technique such as rgb to gray conversion of image, image resize and image filtering using median filter. Localized segmentation is used extract the required image. Using this process features of images is extracted which is useful to identify the diseases and find out the stages of diseases.

II. PROBLEM STATEMENT

Now day's skin diseases become more common problem in human life. Most of these diseases are dangerous and harmful, particularly if not treated at an initial stage. People do not treat skin diseases seriously. Sometimes, most of the people treat these infections of the skin using their own household methods. However, if these household treatments are not suitable for that particular skin problem then it would affect the skin. Also they may not be aware of severe problem of skin diseases. Skin diseases have tendency to pass from one person to another person easily. Hence it is very important to control it at earlier stage to prevent it from spreading in people. The damage done to the skin due to skin diseases also could damage the self-confidence, mental confidence as well as wellbeing of people. Therefore the skin diseases are become a huge problem among people. It has become an important thing to treat these skin diseases properly at the earlier stages itself to prevent serious damage to skin. This system would help to solve this problem to a great extent. Since it system would allow users to determine the skin diseases to provide treatments or advice to patient by making use of images of skin infected with the disease and by obtaining information from the patient.

III. RELATED WORK

In this process first we first pre-process the image for find out required the features of image. First we take the color image of skin which is affected by dermatological disease. Then following process is applied for further process.

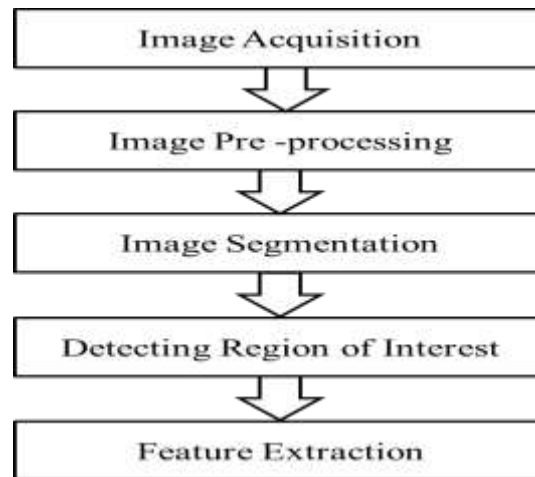


Fig 1 Flow chart of system

1. Developing an algorithm required for image processing techniques

In this section, I develop algorithm for image processing techniques. Every color image has three components red, green and blue. If any operation is perform on color image then this operation perform on three matrix of this color. So avoid this using this algorithm convert the rgb image to gray image.

Captured image have greater size so reduce the memory and faster operation image is resize using this algorithm. If any noise is present in image to remove this noise, filter operation is performing on image. For this operation median filter is used than other filter. Because it is widely used as it is very effective at removing noise while preserving edges.

The results acquired, after applying algorithm to original image as follows.

- Conversion Of RGB image to gray scale image

The rgb to gray conversion is applied on original image then result is shown below

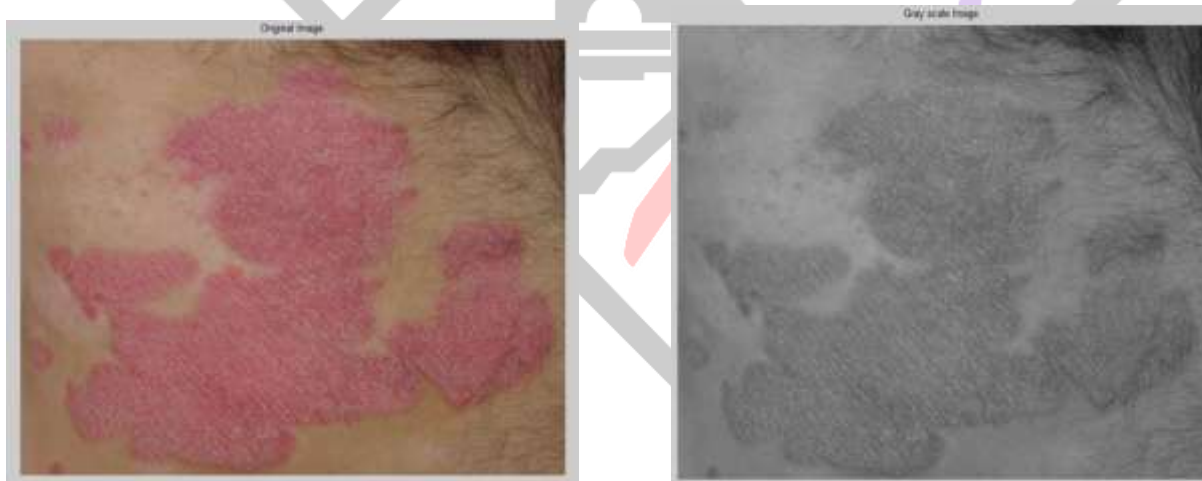


Fig.2 Original Image

Fig.3 Grayscale Image

Then filter operation is applied on this grayscale image to removal of noise. If noise is present in image then image with noise is shown below.

• Removal of noise from image



Fig. 4 Noisy image with salt and pepper noise

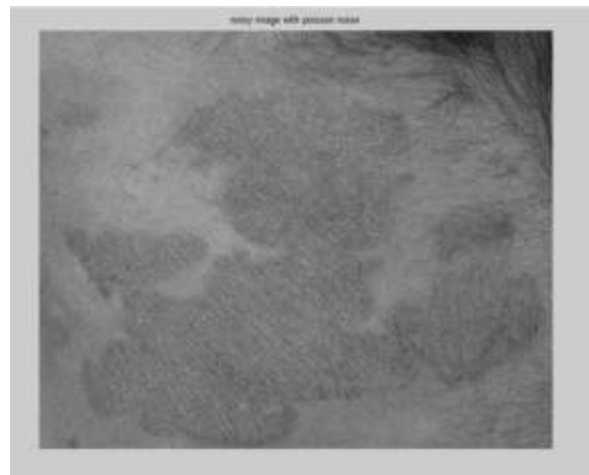


Fig.5 Noisy image with poisson noise

This are some example of noisy image there are different types noise is present in image. Such type noise removal it is very important part in image processing. So for this process we use median filter. After applying median filter on noisy image result is shown below



Fig.6 Filtered images from different noise

1. Developing an algorithm required for image segmentation techniques

In this section, I develop algorithm for image segmentation techniques. Localized segmentation is used to extract required image part. Initially using mouse input (freehand input); boundary for extraction of image is drawn. In localized segmentation repeat the segmentation process for given no of iteration. After final iteration, binary mask of region is created as size of final iteration. This mask is applied on given image to extract the region of interest from image.

• Original grayscale image

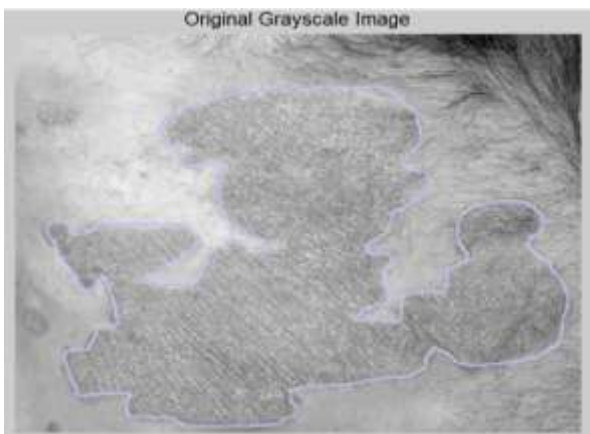


Fig. 7 Free hand mouse input applied on image

Initial created binary mask from given freehand mouse input

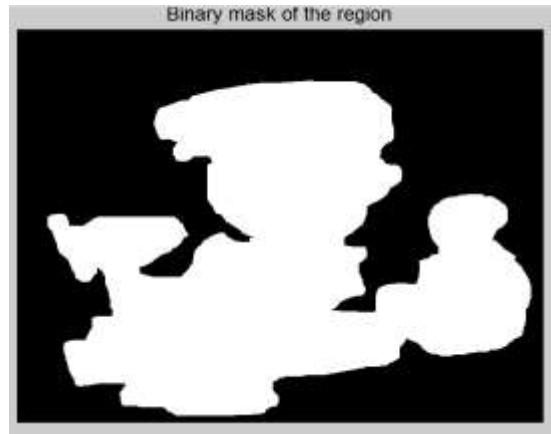


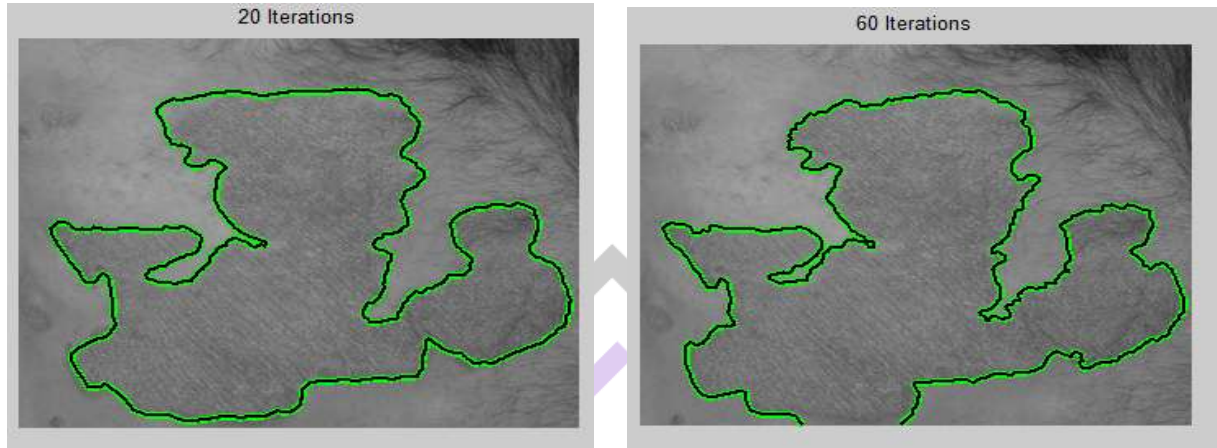
Fig. 8 Initial binary mask from given input

IV. RESULTS

Final binary mask which is provided on image to get region of interest in image. Final binary mask is created after the number of iteration provide in localized segmentation. There are number of iteration provide in segmentation to get more accurate result. After applying no iteration result of localized segmentation given below

After 20 iteration

After 60 iteration



After 100 iteration

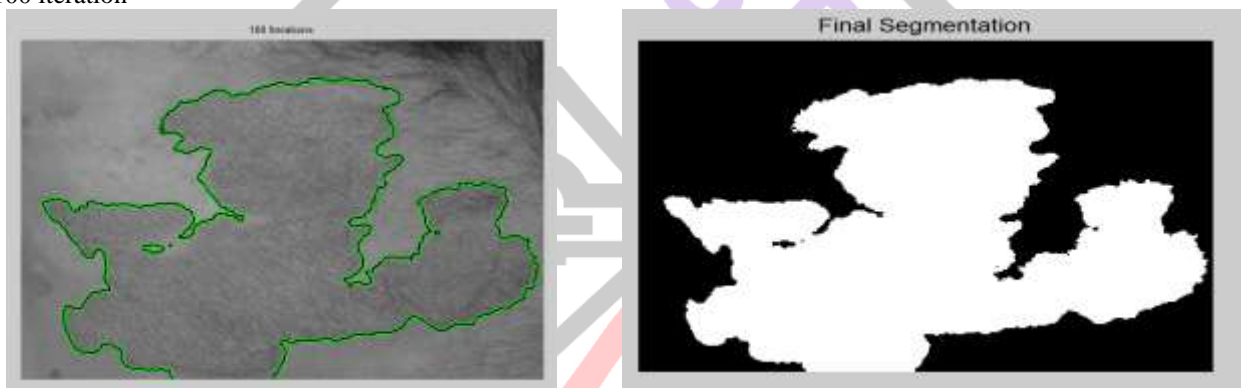


Fig.9 Segmentation level at different number of iteration.

Fig. 10 Final binary mask after complete segmentation

As the iteration level increase we get more accurate result in segmentation. After completion of last iteration, final binary mask is created. Final binary mask is applied on image which is found from last iteration.

Final binary mask after complete segmentation

After creating final binary mask, this is applied on given image to extract region interest of image. Now After getting region of interest of image, area of this reason is find out. For different stages image have different area. Hence after find area we understand the stage of disease that is initial, median or final stage disease. This area of image also useful to identify the disease.

V. CONCLUSION

In this system we presented the automated system to find out the affected area from dermatological disease. As per the area results we decided stages of diseases that is initial stage, medium stage or final stage of disease. Localized Segmentation of the image has been done successfully. An algorithm has been developed to identify the area of infection from segmented image. In addition to work done above we can add some more advancement such as more feature extraction from image. Using the data to train artificial neural network by using such techniques we will obtain final results in next stage.

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