Evaluation and Processing of Foot Ulcer Images for Diabetic Patients

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Abstract -   A more number of peoples are suffered to diabetic foot ulcer in this world. The wound image is captured the high quality of camera, By using MATLAB software to analysis the breadth and depth of the wound by using Adaptive K-Mean algorithm. Assessing diabetes foot ulcer by our self is the way to save travel cost and medical expenses. First the image is converted in to standard form to assess the easy analysis. Then the images are preprocessing to remove noise by using Gaussian filter. To masking and to product the surrounding of the wound.

Keywords: Adaptive K-Mean Algorithm, Diabetic Images Wound Analysis.

I.   . INTRODUCTION

The more number of peoples are affected by diabetic wound. The Diabetic affects the Younger ones to elders. The Diabetic is mainly categorized as Type1 and Type2. In Type1 Diabetic Insulin is generated automatically and In Type2 the insulin is generated, whenever it is required for the process of whole body. In type1 the immune system destroys the beta cells which affects the absorption of insulin from blood in right way whereas, the Type2 Diabetic is very critical disease because, the body could not able to use insulin in proper manner. We are going to analysis only Type2 Diabetics. The Diabetic Foot Ulcer is very dangerous for human life. If they people does not take care of their wounds. If the person is having Diabetic then, the person will be affected by the wound in critical level. The people can take care of the wound at the starting stage. The Patients have to visit clinic to cure the wound. There are still who couldn't be aware of these foot wound.

II.   LITERATURE REVIEW

In [1] deals with diabetic wound image is captured and implemented with MATLAB software by using mean shift algorithm. The wound images are segmented and colored it is used with easily identify the healing status of the wound. The smart phone with digital camera is used to capture the wound image and stored in an image capture box. The drawback is only Nexus 4 Android smart phones are used for particulars and no other smart phones are used. Another drawback is lack of tissue classification, complexity and cost is high.

In[2] deals with wound boundary and it is determination by using mean shift algorithm .The healing status wound is analyze by red, black and yellow colors. The wound images are captured with smart phone. This method is to increase the wound healing status and travelling cost is reduced. The drawback is wound images are not flexible.

In [3] deals with wound image are captured and analyze Android smart phone using mean shift and K- mean Algorithm. This algorithm is used as a high efficient, accurate wound boundary is detected the wound image segmentation. The healing status and wound boundary is easily located with basic colors.

In [4] deals with wound image are capture the high resolution of camera to smart phone, the wounds is analyze by using mean shift Algorithm.

In [5] deals with the wound image are captured by the camera and it is segmented by using Accelerated mean shift algorithm. The healing status are analyze with colors

In [6] deals with diabetic wound image are captured and it is segmented by distance regularized level set evolution (DRLSE) method. To analysis healing status and wound area are easily identified by using K-Mean shift Algorithm.

IV. EXCISTING SYSTEM

The wound images are captured with high quality of digital camera and it is stored image capture box by implemented MATLAB software by using mean shift Algorithm. The image capture box is consider two block, one side is the foot is placed, the foot image are reflected to the inner side of the box. The reflected image is captured in the mobile phone. The mobile phone and PC are connected with Wi-Fi. Then the images are transfer to the PC and analysis of the foot wound. This algorithm is used only in limit applications. Nexus4 Android smart phone is only used in this algorithm and it is not used in different type of smart phone. The main drawbacks are lack of tissue classification, cost is high and complexity. The image is converted   to normal form with 0 to 256 pixels are analysis is very difficult and calculating time will be increase.

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V. PROPOSED SYSTEM

The foot ulcer is captured by the different patients. So we are moving to this technology, to overcome the drawback of the previous system.   The diabetic foot wound is affected by more number of people in the world. So this technique is recover the diabetic foot ulcer. The image is captured by digital camera. By using MATLAB software the image is   analysis by advanced algorithm of adaptive K-mean algorithm. We can analyze the wound in depth and breadth. To analyze of the diabetic wound to known either critical or not. Then the wound is critical we can go and check the hospital, there is a not a necessary of visiting hospitals often. If it is severe wound visit hospital. The image are analysis by adaptive mean algorithm with used in wide range of application and accurate output.

We are writes the coding by using MATLAB to analysis the diabetic foot wound image. First the image is converted into the standard image because easy to analysis. Then the image is outline only the foot wound because   unwanted area of the foot is not analyze. Then mask with unwanted area of the image is collected only the wound area , the diabetic foot wound image is convert to the RGB because the normal color code is 0 to 256 pixels are analyze is complex so we converted to the RGB color code is 256 to 256 pixels are easy to analyze. Finally we are analyzing the depth and breadth of the wound. To know the result values we can analyze the wound stages either normal or critical.

VI. WOUND IMAGE ANAIYSIS

```
Capture the Image ──────► Image storage
        │                       │
        ▼                       │
Image preprocessing             │
        │                       │
        ▼                       │
Image segmentation              │
        │                       │
        ▼                       │
Wound recognition               │
        │                       │
        ▼                       │
Color segmentation ────► Result storage
within the wound                │
        │                       │
        ▼                       │
Wound healing trend ◄───────────┘
analysis
        │
        ▼
Results Analysis
```

The Image capture process is captured analyzed by the wound image by using Smartphone and stored in JPEG file. The image is compress with binary image. The image preprocessing process is captured by wound image in order to remove the noise by using Gaussian filter. The Image segmentation process is the original image can be convert into RGB color image in divided by pixels (256*256).The Wound boundary detection process is detected by the wound in outline. The wound are identify color is used.
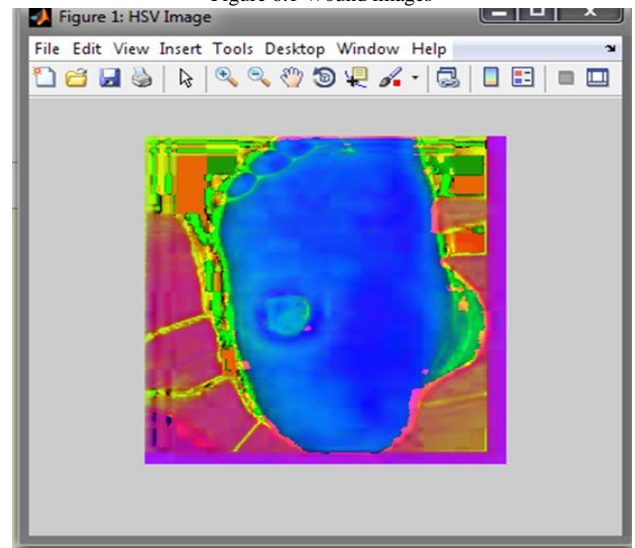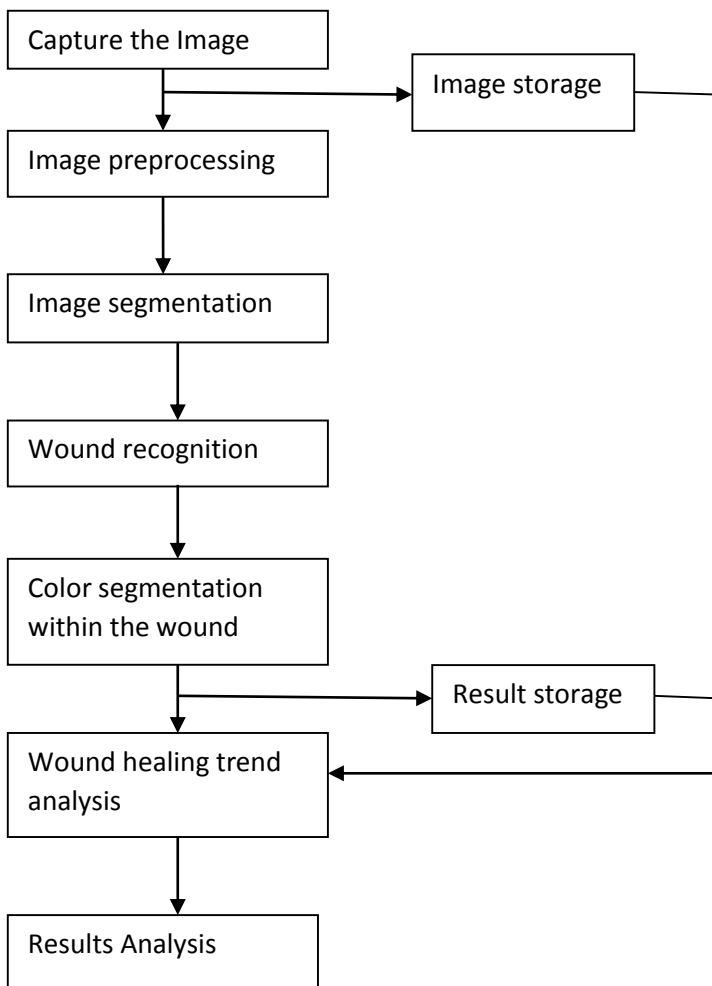

Figure 6.1 Wound images

Figure 6.2 Output image

6.1 Adaptive K-Mean Algorithm

In this method, the number of clusters is predefined and wide range application is used. A large area of   research in clustering   has focused on improving   the clustering process such that the clusters   are not dependent on the initial identification   of   cluster representation.

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VII. CONCLUSION

The wound is captured by camera and analysis breadth and depth of the wound can be using MATLAB software. The adaptive K-mean algorithm used to analysis accurate result. This technique patients is active participants in the own care. This method is used to reduce the cost, complexity and classification of tissues. It is easy to self management of foot ulcer patients.

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