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Wound Investigation in Insulin Insufficient Patients Using Image Processing Technique

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Abstract*— *An injury is a scratch to our body. It is a common phrase that denotes to hurt occurred by a few accidents. Gash is damages which divide the pelt or stiff tissues. It is most treacherous and common complications of diabetes. The compromised protected approach habitually merges diabetes. Increased glucose levels measured down the resistant cells that unleash to brawl off infections. When bacteria stir in to settle on the foot, the ramparts out vain. Ulcers may normally upturn. If infection reaches the bone, elimination is needed. The body has possibility of fighting the infection. Doctors use a lot of tools to take care of infected wounds. In critical slash, handling is very thorny to find the status. In present days, diabetic patient and their care takers have the responsibility to take more care in daily gash care. For the analysis of wound in the insulin insufficient patients, the research concentrates the mean shift algorithm.

Keywords*— *Bacteria, Bone, Insulin, Infection, Outliner

I. INTRODUCTION

Image processing has links with lot of areas of arithmetic, variation logics, harmonic analysis, differential equation etc. For few years, the significance of statistical model has frequently increased, and the interface among researchers in imaging and statistics is wanted on huge subjects. In these methods, for example, are commonly premeditated using a priori differential methodology, but they can be often interpreted in a Bayesian framework, which results exciting aspect to get better samples from purpose annotations on images. Commonly, the development of data raises the necessity for new methods competent of extracting image attributes at a bulky scale. Statistics are a very ordinary way to knob these embrace amount of data. Finally, in particular because of the burgeoning of data sources, the need for non-supervised algorithms has increased in image analysis. Again, the probabilistic or statistical method is acceptably adapted to this task, since it gives an inherent modelling of decision processes. An injury is a scratch to our body. It is a common phrase that denotes to hurt occurred by a few accidents. Gash is damages which divide the pelt or stiff tissues. It is most treacherous and common complications of diabetes. The compromised protected approach habitually merges diabetes. Increased glucose levels measured down the resistant cells that unleash to brawl off infections. When bacteria stir in to settle on the foot, the ramparts out vain. Ulcers may normally upturn. If infection reaches the bone, elimination is needed. The body has possibility of fighting the infection. Doctors use a lot of tools to take care of infected wounds. In critical slash, handling is very thorny to find the status. In present days, diabetic patient and their care takers have the responsibility to take more care in daily gash care. For the analysis of wound in the insulin insufficient patients, the research concentrates the image processing technique.

II. LITERATURE SURVEY

Tarig.et.al, explained that the wound healing is assessed by the wound surface area. The processing steps are carried by smart phone. The image is captured. The file path of this image added into a database. The author down sampled the high resolution image. This was done on horizontal and vertical direction. After that he smoothed the image to remove noise. Image segmentation is to divide the original image into pixel groups with homogeneous color values. Foot outline detection is done by finding the largest connected component in the segmented image. The goal of the system is to provide good wound image analysis through the Smartphone. The wound image analysis algorithm is implemented on Android Smartphone using both CPU &GPU. He obtained the accuracy of 74.6%

III. METHODOLOGY

The wound image is captured by the camera. The wound boundary, the healing status is next assessed based on red, yellow and black color evaluation. Moreover, the healing status is quantitatively assessed, based on trend analysis of time records for a given patient. Wound boundary determination is based on the foot outline detection result. The foot detection result is regarded as a binary image. When the wound boundary is determined and the wound area calculated, after that evaluates the healing state of the wound by performing Color segmentation. The Wound healing trend analysis is performed on a time sequence of images belonging to a given patient to monitor the wound healing status. The current trend is obtained by comparing the wound feature vectors between the current wound record and the one that is just one standard time interval earlier. The mean shift based algorithm models the feature vectors domains associated with the each pixel as instances from an unknown probability density vector (x) and then find clusters in this distribution as section.

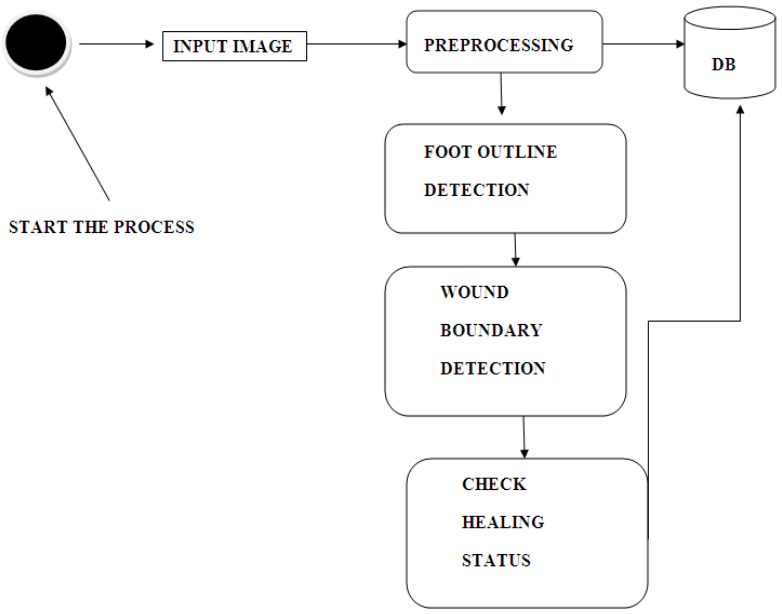

Fig.1. Activity Diagram of the System

PROCEDURE OF WOUND INVESTIGATION

1. Input the image
2. Preprocess the image
3. Detect the boundary and foot outline
4. Start off with any cluster of pixel in an image. ·
5. Determine its center of mass. ·
6. Repeat the process till it reaches the densest region of pixels. ·
7. Calculate the mean shift vector. ·
8. Calculate probability density.
9. Check for healing status
10. Store data's

The quantity m(x) is called the mean-shift vector. So a technique which is dynamically used for segmentation of image is called Mean Shift. For every data point the cluster containing pixel repeatedly moves.

$$P(x) = \frac{1}{n} c \sum k(\| x - xi \|^2)$$

$$\nabla P(x) = \frac{1}{n} 2c \sum (x - xi) g(\| x - xi \|^2)$$

$$g(x) = \dot{k}(x)$$

$$\nabla P(x) = \frac{1}{n} 2c \sum g(\| x - xi \|^2) * \left[\frac{\sum xi * g(\|x - xi\|^2)}{\sum g(\|x - xi\|^2)} - x \right]$$

$$\nabla P(x) = \frac{1}{n} 2c \sum gi * m(x)$$

$$m(x) = \left[\frac{\nabla P(x)}{\frac{c}{n} \sum_{i=1}^{n} gi} \right]$$

IV. EXPERIMENTAL RESULT

In a research the outcome is more important. The outcome makes the work to a better level. After the analysis of the previous research, we have to make it to an experimental stage. Thus implementation is the final but the judgment stage of the research. Foot images are taken by the camera. The image is first pre-processed. Some types of noise are present in the image. In the research a filtering is used to clean the noise. For that the Gaussian method is used. Segmentation is the method of dividing a group of connected pixels.

Let R = Pixel region ; N = Pixel region; Y = Gray tone; P = Neighbouring Pixel to Y

X = Mean; S = Sample Variance; X = 1/N ∑ I(r,c); S = 1/N ∑ (I(r,c) - X); (r,c) ∈ R

Convert the color to Huge, Saturated and Intensity coordinates.

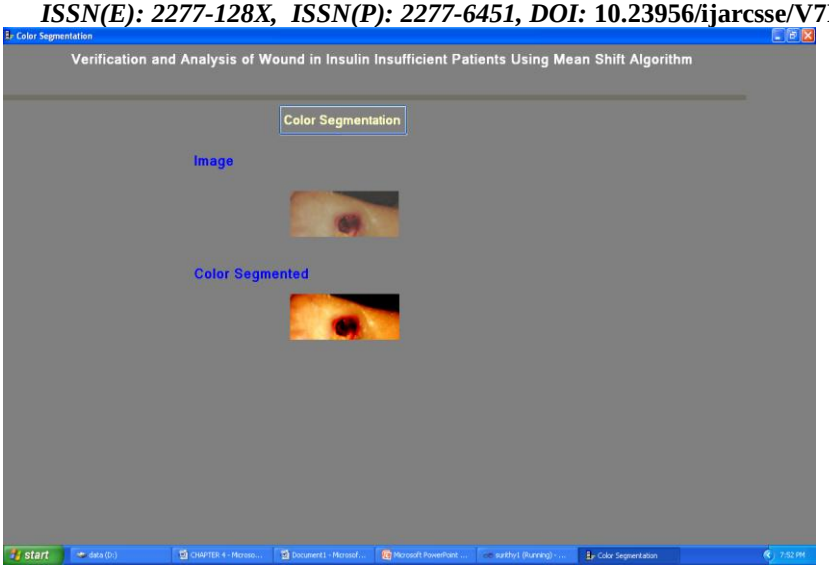

Fig.2. Wound color Segmentation

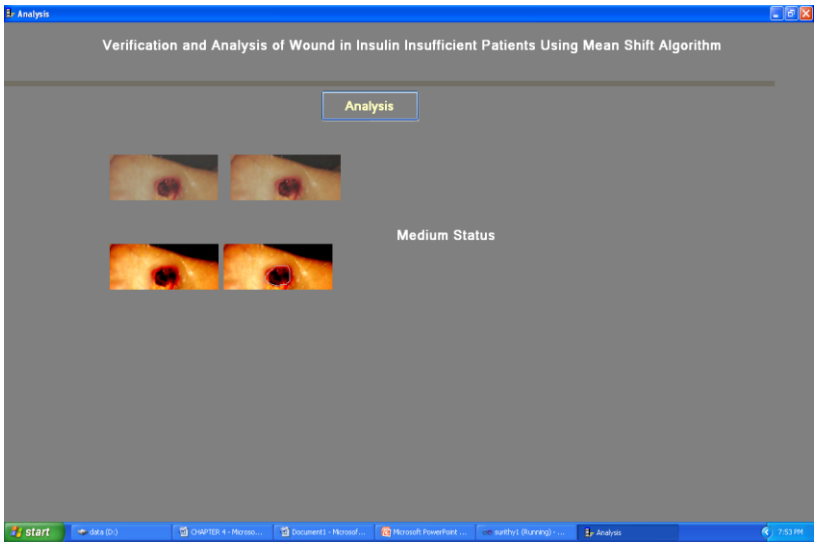

Fig.3. Wound Healing Status

An extensive experiment is evaluated for finding the effectiveness and robustness of the mean shift algorithm. For sampling 15 images are collected in the database.
Accuracy = ((100-((FAR+FRR)/2)) %; Accuracy obtained in the research is 84%

Table I : Accuracy of proposed and existing Methods

Method	Accuracy In Percentage
Tarig.et.al	74.6%
Proposed Method	84%

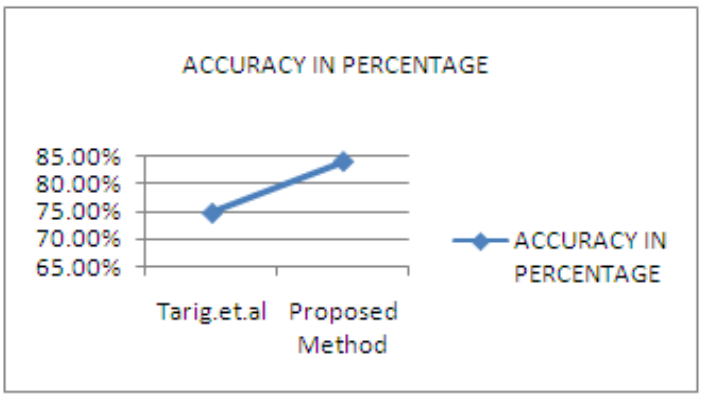

Fig.4. Comparision of proposed and Existing methods

V. CONCLUSIONS

The aspiration of the research is to afford the wound image and healing status analysis. The real trouble of the disease is due to the unbalancing of the insulin. There are so many tribulations with current treatment for diabetic wounds. The patients should go to hospital on a common basis for check the wound by clinicians. Because of this so many disturbances occurred such as inconvenient, cost and time consuming for clinicians and patients. In persistent treatment is very complex to find the healing status. The mean shift boundary detection technique is used to investigate the boundary result. Overall data's are store in database. The cost of the work is considerably reduced. Also it will reduce the patients stress. Physician can examine the crisis without difficulty through the images. The suitable statement of the healing can be given to the patient on time. It is uncomplicated to use for self-management and self-monitoring. In future the research can be expanded by analysing the wound by the measurements of dead cells and we can give suggestions for the healing.

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