A Novel Threshold Technique and Fuzzy C-Means Algorithm for Segmentation of Wound

Sirisha Konakala
M.Tech Scholar,C.S.E
Vasireddy Venkatadri Institute of Technology
Nambur , Guntur, A.P , India

Sudhakar Putheti, B.Tech,M.Tech
Associate Professor,C.S.E
Vasireddy Venkatadri Institute of Technology
Nambur , Guntur, A.P, India

ABSTRACT
Skin color based wound region segmentation is proposed by using threshold segmentation and fuzzy-C means techniques. This letter gives wound on skin location should be precisely identified. These methods are identified the edge regions of the wound part that can help clinicians in their diagnosis. This letter describes the use of threshold values and FCM clustering algorithms for detection of wounds on the skin. In this letter This paper presents the application of fuzzy C-means clustering algorithm for skin color segmentation problem. This proposed method is able to take both the distributions of color space and the spatial interaction between surrounding pixels during clustering. This clustering algorithm have more advantages the result obtained from different wound images have been discussed.

Key Words
Skin Color segmentation, Wound Detection, FCM.

1. INTRODUCTION
The clustering is the act of partitioning unlabeled data set into groups of similar objects. Human skin color detection is a crucial method for several biometric applications of computer vision [3]. At present in selected images are detected faces of all persons in either video or images to be solved if an efficient skin color space method is constructed. Recently the growing of interest in the problem of skin segmentation, which aim to detect wound on skin regions in an images.

The skin segmentation is a very effective because it involves amount of computation and can be done selected pose. The existing skin segmentation algorithm involves classification of different image pixels into skin and non-skin techniques on the basis of pixel color [1],[3]. At present the skin colors in the original image are initially detected using skin color model on the Bayesian decision method for cost and nonparametric threshold estimation. Normal wound is caused by leg ulcer is given in Fig.3. Basically wound care includes weekly check-up of a patient at which an image is acquired. In Digital Image Processing of skin on wound may provide a method that of objective, reliable, and reproducible, compared with what the human eyes are sees. These skin regions segmented will be further processed in this paper stage of skin wound segmentation that utilizes various color spaces to label pixels as a skin including of normalized color spaces RGB [12], HVS [9], and Y Cb Cr [1].

This project proposes a skin wound region segmentation for color images sequences. The proposed uses a combined human skin color model to classify wound part and non wound part of skin colors. Compared many existing skin segmentation approaches, the proposed FCM [5] and [6] algorithm combined to color spaces for skin segmentation and use property of skin color to set the threshold for removing noise and detect the wound that similar to skin color.

2. RELATED WORK
The process of image clustering is identifying groups of similar image primitives. The image primitives are pixels, regions, line elements and so on, depending on the user requirement. The basic image processing techniques are quantization, segmentation and coarsening can be viewed various instances of clustering problems. The partitioning of an image can be divided multiple constituent modules is called segmentation. In this project the image segmentation is plays main role of this wound detection and image processing understand. In image processing we have number techniques are available; it can be classified into various categories.

- Histogram based segmentation.
- Neighborhood based segmentation.
- Surface fitting based segmentation.
- Physically based segmentation.
- Threshold values based segmentation.

The aim of this project is on approach based on threshold segmentation and FCM, C-means, [5] K-means, pillar K-means are overcome the previous existing problem. When a user applied these methods on selected image the wound boundary detection is very simple and will get efficient results.

3. METHODOLOGY
In this technique for wound skin image segmentation is shown in Fig.2.

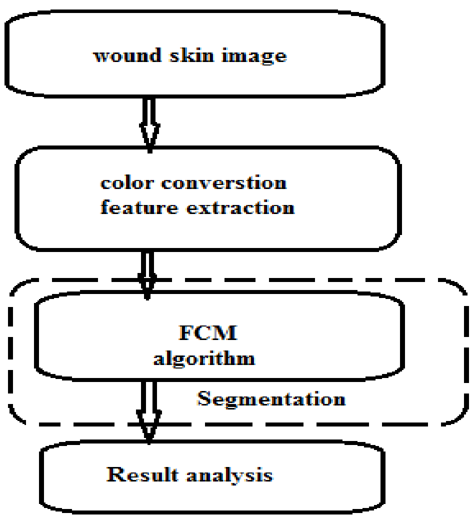

Fig.2. Proposed Methodology

In this proposed methodology consists of following stages. Wound skin image database, color conversion or feature extraction, FCM based segmentation and pillar K-means based segmentation.

3.1 CONVENTIONAL FCM TECHNIQUE

Fuzzy C-means (FCM) is a method of clustering can be allows one pixel to belong more clusters. The FCM attempts to divide a finite collection of pixels into a collection of C fuzzy clusters with respect to some given criterion. Based on the data and the application, and various types of similarity measures may be used to find the classes. In this letter main work is the images are segmented into four clusters namely white matter, gray mater, CSF and the abnormal skin region based on the feature values.

Fuzzy C-means algorithm is based on minimization of the following objective function:

$$J(U, c_1,c_2, . . ,c_c)= \sum_{i=1}^{c} J_i = \sum_{i=1}^{c} . \sum_{j=1}^{n} u_{ij}^m d_{ij}^2 \quad (1).$$

u_{ij} is between 0 and 1.
C_i is the centroid of cluster I;
d_{ij} is the Euclidian distance between i_{th} centroid (c_i) and j^{th} data point.

Thus the FCM algorithm yields the segmentation of wound skin images based on the number of clusters used. The wound portion of the input image is grouped into one particular cluster which can be easily extracted. But the drawback of algorithm is the slow training processes to achieve the stabilization condition. That pillar K-means and modified FCM algorithm which speed up the training processes is highly essential for real time applications.

4. EXPERIMENTAL RESULT

The result of pixels classification pixels according to general FCM method and our modified FCM [5] approach. The general fuzzy clustering method results depend on the number of clusters. The clusters are not optimal and the regions are not homogeneous. When skin model and MFCM clustering are combined, the areas are more homogeneous and more compact. The results are interesting to take account at the same time our skin model, which is composed of HSV [9] components and spectral distributions, and the surrounding pixels. Nevertheless, the reaming small areas it will be necessary to eliminate noise according to applications. The segmentation which preserve contours of the representative homogeneous areas and also allow the space localization of the coherent wound area.

The performances of the system 3 different wound images were used. Skin wounds on patients were photographed at approximately away from the wound using a digital video camera. Various iteration numbers used for getting better results from the experiments. Figure 3 demonstrate a sample wound image, Figure 4 demonstrate the result of threshold segmentation binary masking.

Fig.3. sample color wound image.

Fig 4. Fuzzy C-means segmentation results.

The depths of the wound have different intensity values than rest of the skin as gaps. The segmented wound look natural, smooth the object plain by eroding twice image with a diamond shape element.

Fig.5. Enhanced Result.

Fig.6. Outlined segmentation Result.

It is possible now for the clinician to examine the size or the other parameters of the wound. The process can be simply monitored from the automatically segmented images.

5. CONCLUSION

In this article presented a clustering approach using FCM. The FCM method is applied to perform skin wound detection based on decision rules in hybrid space. In this paper, a skin color segmentation using the C-means algorithm is presented. This means of segmenting the image into two classes, skin and wound skin regions, by using neighboring data to force the algorithm to create regions. The problem of identifying the wound skin color is identified, so spatial data mining methods is used for this task and integrate with a segmentation method to identify significant wound skin color regions in an image. This paper showed its effectiveness.

6. REFERENCES

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