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A new masks group called A. H. SH. Rostom for Mycosis Fungoides Skin image Edge detection

Dr. Ali Hassan Nasser Al-Fayadh
Assistant .Professor.
Mathematic Department
Mathematical and Computer Sciences
College Kufa University, Iraq
aalfayadh@yahoo.com

Hind Rostom Mohammed
Assistant Professor
Computer Department
Mathematical and Computer
Sciences College/ Kufa University,
Iraq
hindrustum.shaaban@uokufa.edu.iq

Shaymaa Maki kadham
Mathematic Department
Mathematical and Computer
Sciences College
Kufa University, Iraq
a.alkhafajee@yahoo.com

Abstract—In the present paper, new method called (A.H. SH..Rostom Group masks) for Mycosis Fungoides Skin image Edge detection is proposed. The Group consists of 10 masks were geometry of the mask operator determines a characteristic direction in which it is most sensitive to edges. applied to the four stages of the Mycosis Fungoides disease Skin image have been identified and the edges of the images used for each and every stages that the database consists of 40 images divided each stage of the Mycosis Fungoides disease Skin image 10 images. For each stage a novel algorithm which combines pixel and region based color segmentation techniques is used. The experimental results confirm the effectiveness of the proposed A.H. SH.Rostom Group masks .

Index Terms—Edge detection ,Skin image detection, Segmentation, Image processing.

1 INTRODUCTION

Edge detection is an important field in image processing. It can be used in many applications such as segmentation, registration, feature extraction, and identification of objects in a scene. An effective edge detector reduces a large amount of data but still keeps most of the important feature of the image. Edge detection refers to the process of locating sharp discontinuities in an image. These discontinuities originate from different scene features such as discontinuities in depth, discontinuities in surface orientation, and changes in material properties and variations in scene illumination[1,2].

The boundaries of object surfaces in a scene often lead to oriented localized changes in intensity of an image, called edges. This observation combined with a commonly held belief that edge detection is the first step in image segmentation, has fueled a long search for a good edge detection algorithm to use in image processing [3]. Edge detection of an image reduces significantly the amount of data and filters out information that may be regarded as less relevant, preserving the important structural properties of an image. Therefore, edges detected from its original image contain major information, which only needs a small amount of memory to store[4].

Edge detection produces something like a line drawing of an image, which highlights the intensity changes. In general, the boundaries of objects tend to produce sudden changes in the image intensity[5]. different surfaces of an object receive different amounts of light, which again produces intensity changes[6]. Edges are effected by noise present in an image though .An edge may be regarded as boundary between two dissimilar regions in an image .edge detection is a terminology in image processing and computer vision , particularly in areas of feature detection and feature extraction[7].

The paper is organized as follows; Section 2 deals with the A.H. SH.Rostom Group masks are considered to determine the Mycosis Fungoides Skin image area. Section 3 deals with the Edge Operations i.e opening to perform the connected component analysis, section 4 gives the overview of algorithm with Experimental Results and last section 5 ends the paper with conclusion

2 A.H. SH.ROSTOM GROUP MASKS

A human skin color model is used to decide either a pixel is skin color or non skin-color[5]. In this research, we use mew method called(A.H. SH.Rostom Group masks) Mycosis Fungoides Skin image edge detection . A.H. SH Rostom Group masks consists of 10 masks determines a characteristic direction edge.

The Details of values for each mask in A.H. SH.Rostom Group masks shown in figure(1) and the skin images library samples, two types of images (A)Samples with Mycosis Fungoides diseases Skin images (B) Samples with other diseases shown in figure(2).

M1

1	√2	1
2	√2	2
1	√2	1

M2

1	2	1
√2	√2	√2
1	2	1

M3

1	√2	1
√2	√2	√2
1	√2	1

M4

0	√2	0
2	√2	2
0	√2	0

M5

0	2	0
√2	√2	√2
0	2	0

M6

0	√2	0
√2	√2	√2
0	√2	0

M7

√2	2	1
1	√2	1
1	2	√2

M8

1	2	√2
1	√2	1
√2	2	1

M9

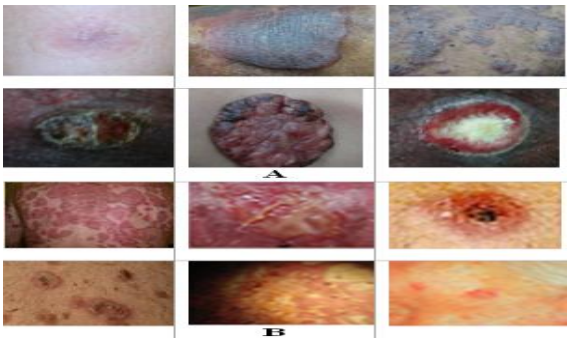
√2	1	√2
2	√2	2
√2	1	√2

M10

√2	√2	√2
√2	√2	√2
√2	√2	√2

Figure(1): A.H. SH.Rostom Group masks

A.H. SH.Rostom Group masks determined for direction edge: M1= Vertical1 ,M2=Horizontal1 M3= Vertical-Horizontal1 M4= Vertical2 M5= Horizontal2 M6= Vertical-Horizontal2 M7=Diagonal1 , M8= Diagonal2 M9= Diagonal1- Diagonal2 M10=Mask roots



Figure(2): The skin library samples, (A) Samples with Skin diseases (B) Samples with other diseases

3 Experimental Results

In this section a detailed experimental comparison of the above stated A.H. SH.Rostom Group masks has been presented. We have used two types Mycosis Fungoides Skin image databases:

(1) database prepared in our conditions ,images obtained from in Al-Sder Hospital.

(2) Skin database [4] and some other images obtained from internet.

Mycosis fungoides is a T-cell lymphoma of the skin. The disease is caused by the proliferation of T-lymphocytes, also known as helper T cells[8].

In this paper divided stages images as

Stages in mycosis fungoides(10 images for each stage)

Stage 1

The cancer only affects parts of the skin, which has red, dry, scaly patches, but no

tumours. The lymph nodes are not larger than normal.

Stage 2

Either of the following may be true:

• The skin has red, dry, scaly patches, but no tumours. Lymph nodes are larger than

normal, but do not contain cancer cells;

• There are tumours on the skin. The lymph nodes are either normal or are larger than

normal, but do not contain cancer cells.

Stage 3

• Nearly all of the skin is red, dry, and scaly. The lymph nodes are either normal or are larger than normal, but do not contain cancer cells.

Stage 4

The skin is involved, in addition to either of the following:

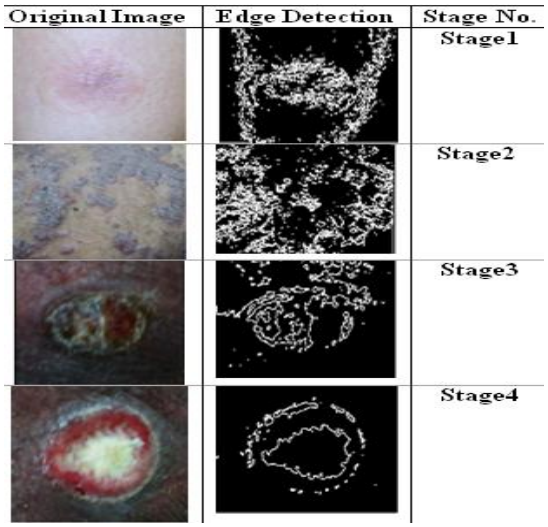
• Cancer cells are found in the lymph nodes;

• Cancer has spread to other organs, such as the liver or lung[8].

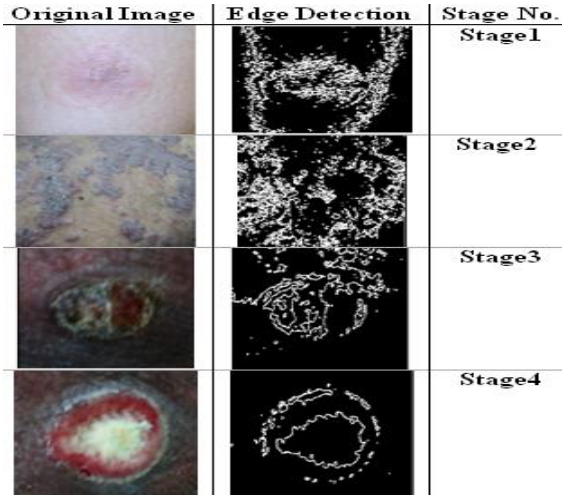
Experimental Results for Appling Edge Detection mask shown in figure (3,4,5,6,7,8,9,10,11,12).

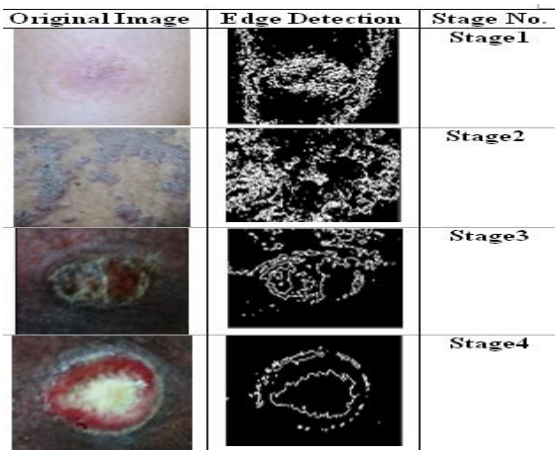
4 Conclusion

new method called (A.H. SH.Rostom Group masks) for Mycosis Fungoides Skin image edge detector presented in this paper uses ten masks determines a characteristic direction in which it is most sensitive to edges . The proposed method is decrease the computation time with generate high quality of edge detection. Experiment results have demonstrated that the proposed scheme for edge detection works satisfactorily for different levels digital images. Another benefit comes from easy implementation of this method. A.H. SH.Rostom Group masks for Mycosis Fungoides Skin image Edge detection is necessary to provide a robust solution that is adaptable to the varying noise levels of these images to help distinguish valid image contents from visual artifacts introduced by noise. The experimental results show the satisfying subjective test results and The simulation results are very promising.

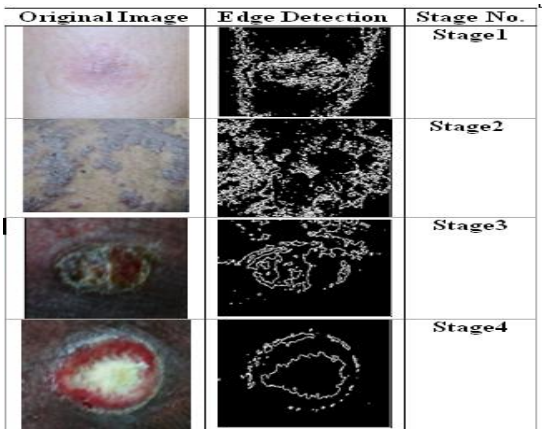


Figure(3):(A):Original Skin Image , (B) Edge detection by M1 for A for all Mycosis Fungoides Skin image stages

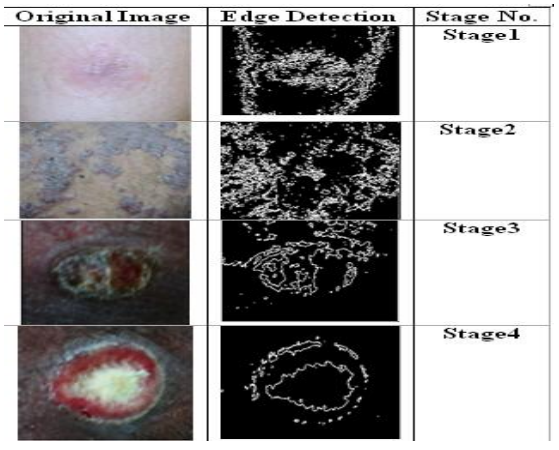




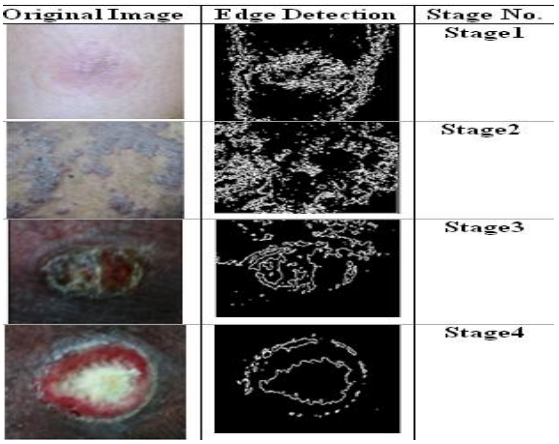
Figure(5):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



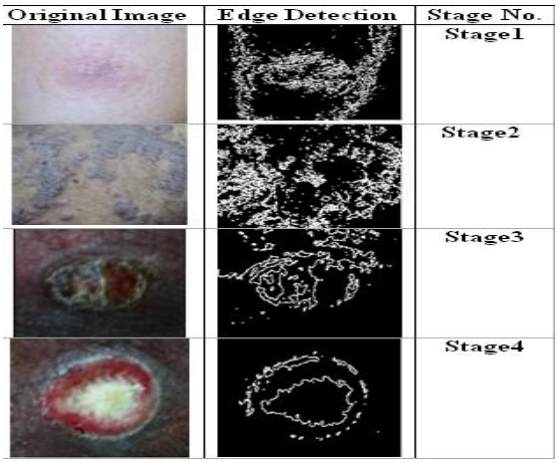
Figure(6):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



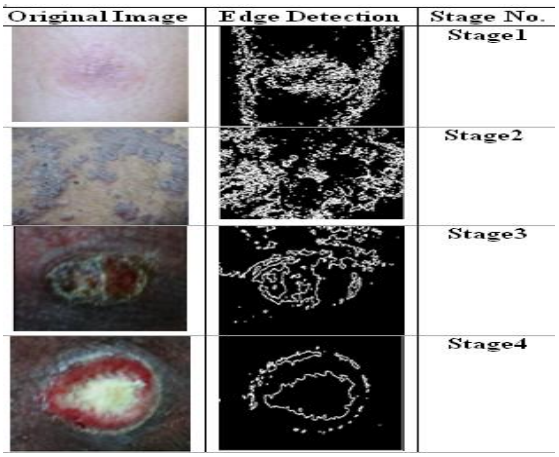
Figure(7):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



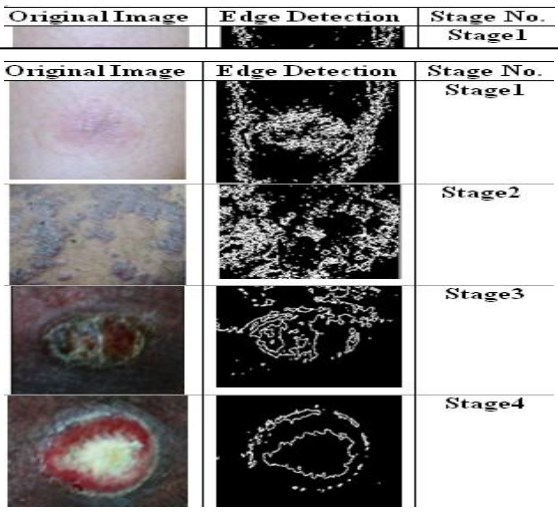
Figure(8):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



Figure(9):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



Figure(10):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages



Figure(12):(A):Original Skin Image , (B) Edge detection by M3 for A for all Mycosis Fungoides Skin image stages

Table (1) shown the comparison for A.H. SH Rostom Group masks for Mycosis Fungoides Skin image Edge detection. Edge detection are computationally more expensive compared to M1, M2, M4, M5, M7 and M8 masks. However, the M10 edge detection algorithm performs better than all these operators under almost all scenarios. Evaluation of the images showed that under noisy conditions, M10, M9, M6 and M3 exhibit better performance, respectively.

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