

## DIAGNOSIS OF DERMIS SYNDROME USING IMAGE PROCESSING TECHNIQUES IN ANTHROPOID

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### ABSTRACT

*Skin dermis is mostly found in animals, humans and plants. A skin defects is a particular kind of infection caused by bacteria or virus. These diseases like alopecia, ringworm, yeast infection, brown spot, allergies, eczema etc. have various perilous effects on the skin and keep on spreading over time. It becomes imperative to diagnose these defects at their pioneer stage to control it from spreading. These diseases are sanctioned by using many technologies such as image processing, data mining, artificial neural network (ANN) etc. Recently, image processing has played a primary role in this area of research and has generally used for the detection of skin diseases. Techniques like segmentation, filtering, image pre-processing, edge detection and feature extraction etc. are part of image processing and are used to describe the part affected by disease, the form of affected area, its afflicted area color etc. This paper presents different skin disease diagnosis systems using image processing approaches. An exhaustive learning of skin disease diagnosis systems are done in this paper, with different methods and their performances. These techniques are carried out with an experiment by using MATLAB software.*

**Keywords:** *Image Processing, Skin Diseases, Array Indexing, Segmentation, Edge Detection Techniques.*

### 1. INTRODUCTION

The image processing techniques are to perform some operations on an image using statistical operations, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which the input is an image and the output may be image or a set of characteristics or features associated with that image. Image processing is closely related to computer graphics and computer vision. In modern sciences and technologies, images also gain much broader scopes due to the ever growing importance of scientific revelation (of often large-scale complex scientific/tentative data). In the image processing and computer perception of intensity, aspect and structures are important .But the structure based study is most important in exterior analysis. Skin is the surface of the body having some texture; infected skin has different types in the

texture of the skin. The infected skin is illustrious from dermatitis which is inflammation is called infective dermatitis.

## **1.2. LITERATURE SURVEY**

Many approaches have been proposed to analyze and recognize textures in an automated fashion. In [1] Y. P. Gowramma et al. (2014) proposes an algorithmic representation for automatic classification of skin diseases using curvelet filter along with the k-nn classifier and it is segmented using a marker-controlled watershed segmentation method. In [2] A. A. L. C. Amarathunga et al. (2015) proposes the skin disease diagnosis system which to uses the technologies such as image processing and data mining for the image is immediately segmentation of images using threshold values and to suggest the medical treatments. In [3] Valentin Lymbchenko et al. (2016) proposes a computational approach for analyzing the fauna and flora, and the detection and diagnose of diseases by applying the methodology of color image segmentation. It makes to automate the process and reduce the time of diagnosis of infectious dangerous fish diseases. In [4] Nisha Yadav et al. (2016) proposed a skin disease is caused by bacteria or an infection these diseases like alopecia, ringworm, yeast infection, brown spot, allergies, eczema, etc by using many technologies such as image processing, data mining, artificial neural network. The detection techniques like filtering, segmentation, feature extraction, image pre-processing and edge detection. In [5] R. Yogamangalam et al. (2013) have been proposes a brief online on most common segmentation techniques like thresholding, model and edge based detection, clustering and so on. It uses the Markor Random Field (MRF) method of noise cancellation in images. In [6] R. Sumithra et al. (2015) proposes the skin images are filtered to remove the unwanted hairs and noise for using the segmentation techniques and the classification of skin lesions for disease diagnosis the SVM, K-NN classifiers and Computer Aided Diagnosis (CAD). In [7] Damilola A. Okubayejo et al. (2013) proposed the cancerous skin disease such as melanoma and nevi there have been high expectations for techniques such as Dermoscopy or Epiluminiscence Light Microscopy (ELM) and modeling a system that will collate past Pigmented Skin Lesion (PSL) by medical experts using prototyping methodology. It uses the computational intelligence techniques to analyze process and classify the image library data based on texture and phonological features of the medical images for remote health diagnosis in the skin disease. In [8] Jamils A. M. Saif et al. (2016) proposed the image of edge detection in image analysis, object recognition used to detect the edges of object in the image. This paper address the problem of gradient based image edge detection to produced the binary images using the medical as well as natural images. In [9] Ms. Kabade Manarnika Manohar et al. (2016) proposed the classic and visual issues in image processing it has been the hotspot for the researchers to makes the image more simple and meaningful. It covered a review on segmentation techniques such as thresholding, edge based, region based and clustering approaches. In [10] Sujata Saini et al. (2014) proposes the image segmentation algorithms to segmented the complexity image used in the image processing applications, computer vision and so on. It provides the emphasized of edge based, region based techniques and watershed transformation.

## **2. METHODOLOGY**

### **2.1 PROBLEM IDENTIFICATION**

Human skin is a complicated to understand the skin problem due to the pigment structure, melanin and hemoglobin are the pigments in the skin, if slight variation occurs in the pigment, there occurs change of color in the skin, By consider the skin texture, a lot of perception can be made in regard to the nature and crassness of the skin. Skin diseases are spreading of the infection from one individual to the other. So it is needed to cautious as to the skin care. When the skin diseases are detected by using the array indexing techniques and segmentation they are edge based method and ANN concept of feed backward algorithm. The following are some of common skin diseases,



Fig.1 Chronic dermatitis

- skin appear skinny and itches
- can split and ooze liquefied
- skin petrify and appears
- brown and thick in ensuing stages
- ulcer forms in eventual stages



Fig.2 Lichen plans

- purplish-colors bumps with flush acme
- lesions that establish and spreading over the course of two weeks to a few months
- itching, furuncle, and white lines over the hives



Fig.3 Pityriasis Rosacea

- subtype 1: flush,redness, and broken blood vessels
- subtype 2: zits-like breakouts,redness, and oily skin
- subtype 3: choppy skin,hard shell on nose,forehead,cheeks,and ears
- subtype 4: bloody,anemic,arid, and itchy eyes



Fig.4 Psoriasis

- plaque: chunky red patches of skin
- face and scalp
- inverse: a red,sparkly,smooth,irritation in skin folds
- guttate: small red acne on the body,arms
- pustular: whiteheads surrounded by red derma
- erythrodermic: resembles cruel burns and covers huge portions of the body



Fig.5 Seborrheic dermatitis

- yellow or white peeling patches that flake off
- affected areas may be red,scratchy, and oily
- hair loss may arise in the area with the rash

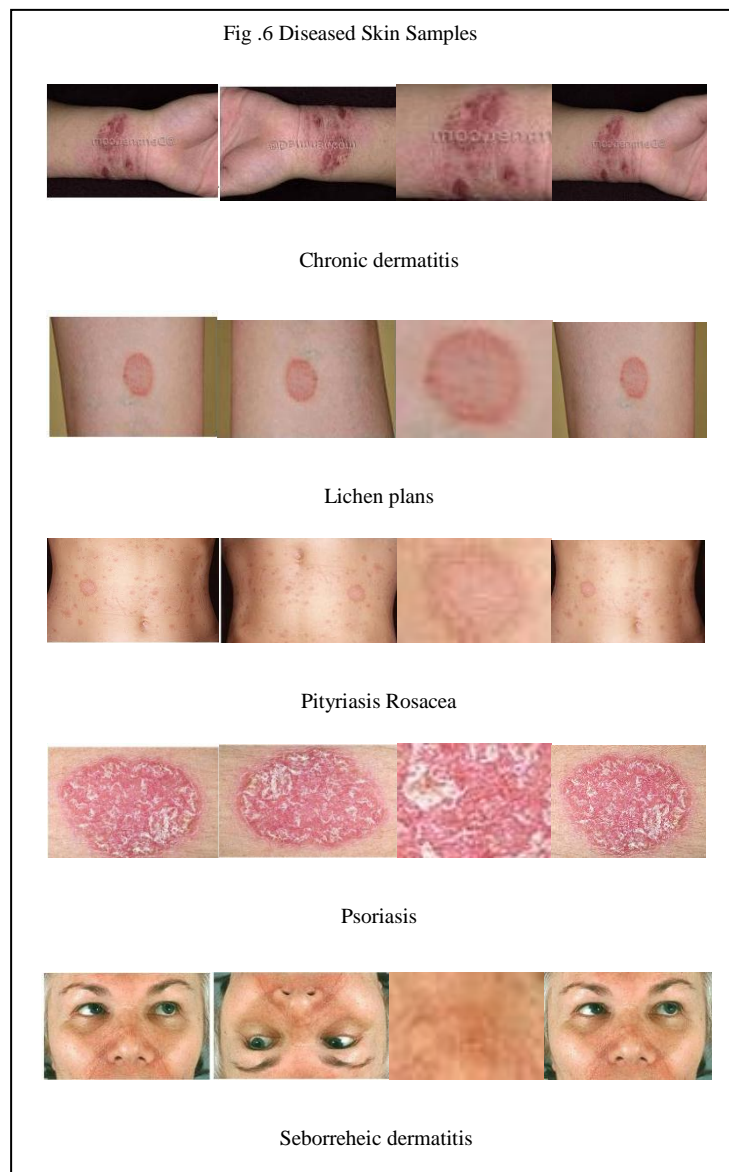
## 2.2 ARRAY INDEXING AND SEGMENTATION TECHNIQUES

### 2.2.1 ARRAY INDEXING

Array indexing is a data structure consisting of a group of elements (principles, or variables), each recognized by at least one array index or key by a mathematical formula. It writes the image as a respective file into applying the flipped and cropped on an image. Finally the image has been sub sampled for the corresponding files and to design and expand a computer apparatus based system for segmentation and classification of skin lesions along with extraction of discriminating set of features from skin lesions for proficient classification.

MATLAB supports a number of capable indexing schemes that simplify array manipulation and improve the performance of programs. In the basic indexing in one and two dimensions (i.e., vectors and matrices), as well as indexing approach useful with binary images. An array of dimension  $1 \times N$  is known as a *row vector* it can be

accessed using an individual index value (also called a *subscript*). Some simple image operations using array indexing.



Results retrieved using array indexing. (a) Original Image. (b) Image Flipped Vertically. (c) Cropped Image. (d) Sub sampled Image.

### 2.2.2 SEGMENTATION

Image segmentation is the separation of an image into regions or categories, which correspond to objects or parts of objects. *Every* pixel in an image is appropriated to one of a number of these categories. A superior segmentation is as a rule one in which: pixels in the same category have agnate grey scale of different values and form an associated region; adjoining pixels which are in various categories have unrelated values.

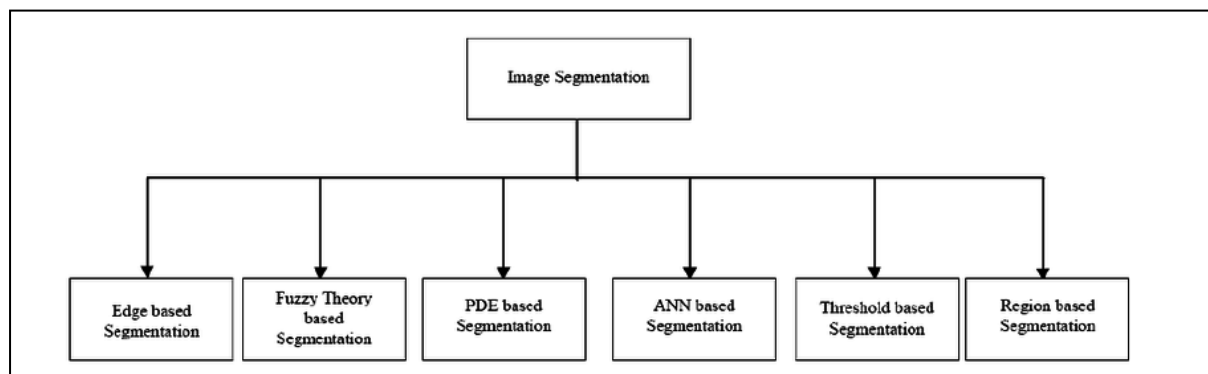


Fig.7 Segmentation Techniques

### 2.2.2.1 EDGE BASED SEGMENTATION

Edge detection is a process of digging an edge of an image. Detection of edges in an image is a considerable step towards accepting image features. Edges are composed of meaningful features and contained fecund information. It reduces drastically the amount of the image size and filters out info that may be attend as less relevant, defend the important structural properties of an image. Since edges often occur at image locations defining object boundaries, edge detection is generally used in image segmentation when images are separated into areas corresponding to diverse objects.

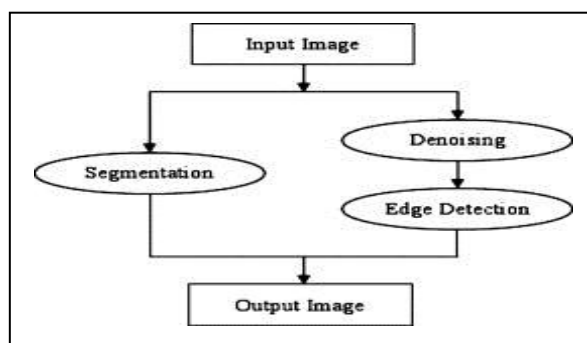


Fig.8 Edge Based Process

## 2.2. PREWITT OPERATOR

Prewitt operator is approach of edge detection in image processing which determines the maximum response of a set of contortion kernels to find the local edge assimilation for each pixel. The Prewitt edge discoverer is adapt the way to estimate the magnitude and orientation of an edge. Although transmission gradient edge detection needs a rather time-consuming computation to estimation of the orientation from the eminence in the x- and y-directions.

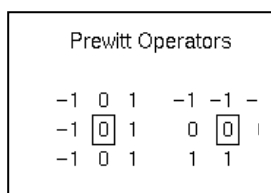


Fig.9 Prewitt Operator

### 2.2.2.3 SOBEL EDGE OPERATOR

The Sobel operator engaged in 2-D spatial slope amplitude on an image and so dramatize regions of high spatial constancy that synchronize to edges. Typically it is used to find the proximate entire gradient magnitude at each point in an caution grayscale image. In theory at least, the operator composed of a pair of 3x3 convolution kernels.

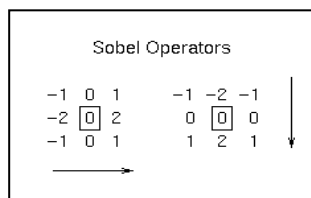


Fig.10 Sobel Operator

### 2.2.1.3 ROBERTS EDGE DETECTION

The Roberts edge detection is popularized by Lawrence Roberts (1965). It performs a simple, quick to compute, 2-D spatial gradient measurement on an image. This method emphasizes regions of high spatial iteration which often is identical to edges. The input to the operator is a grayscale image the same as to the operant is the most common usage for this technique. Pixel values in every point in the output appear as the predicted complete significant of the spatial gradient of the input image at that point.

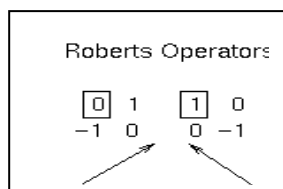


Fig.11 Roberts Operator

## 3. RESULTS AND DISCUSSION

Figure (figure to figure) shows the various kinds of diseases infected to the skin in various parts. We have used the software MATLAB R2009a and the hardware 2GB RAM Intel core i3 to obtain the desired results. Edge based segmentation techniques are applied on the diseased part of the skin and observed the resulting output image which gives good clarified region of the disease.

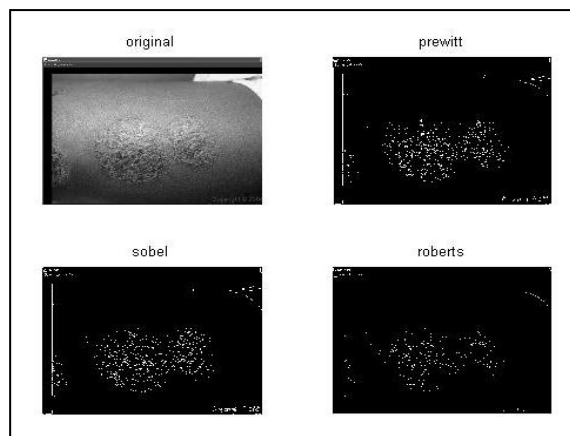


Fig.12 Chronic dermatitis

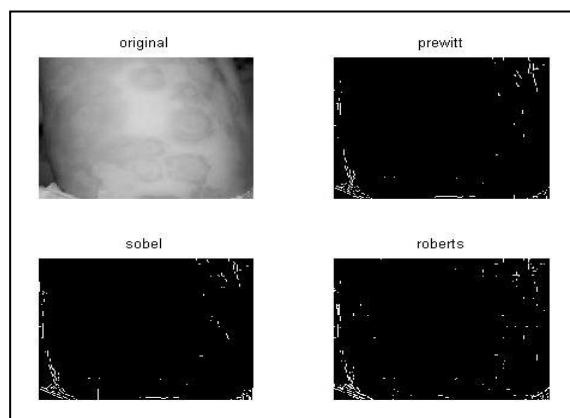


Fig.13 Lichen plans

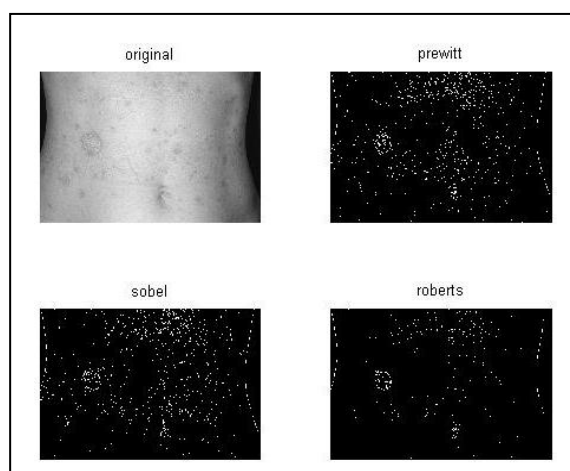


Fig.14 Pityriasis Rosacea



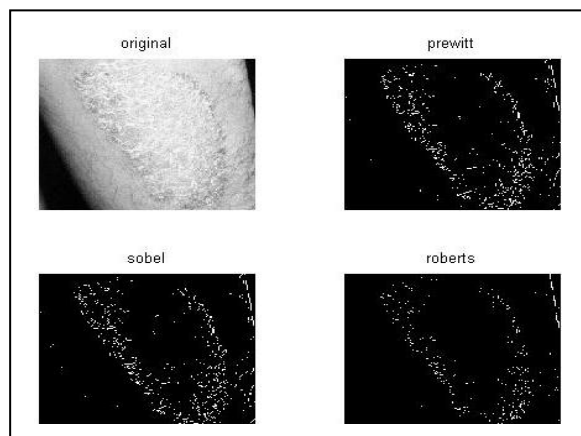


Fig.15 Psoriasis

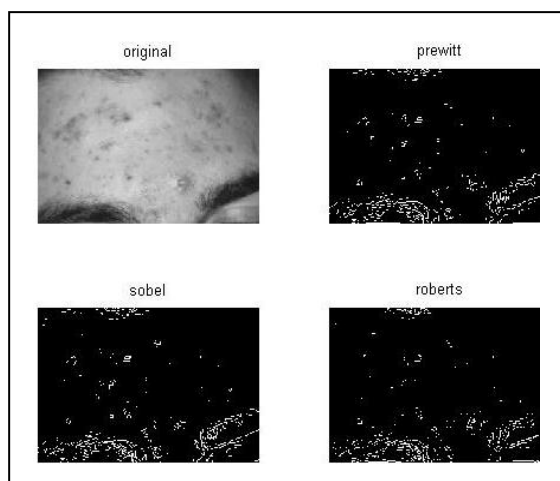


Fig.16 Seborrheic dermatitis

Results retrieved using array indexing. (a) Original Image. (b) Prewitt Image. (c) Sobel Image. (d) Roberts Image.

#### 4. CONCLUSION AND FUTURE ENHANCEMENT

The main locus of this paper is on consider the texture of skin there by using it to diagnose the skin defects. From the experiential results discussed above, our proposed array indexing and segmentation of edge based detection can serve as an effective tool in identifying skin diseases. The eventual work will be based on establishing algorithms to identify various other skin diseases, to progress the overall performance and also to further reduce the computational time. There are future scopes of developments in present methodologies as no model assurance hundred percent accuracy and is also limited to few number of skin diseases. In future tehniques can be expanded for the detection of skin diseases in humans. A common model should be developed for identification of all types of skin disease.

## REFERENCES

- [1]. M. N. Do and M. Vetterli. Orthonormal niteridgelet transform for image compression. In Proc. of IEEE International Conference on Image Processing (ICIP), September 2000.
- [2]. E. J. Candès and D.L. Donoho. Edge-preserving denoising in linear inverse problems: Optimality of curvelet frames. Technical report, Department of Statistics, Stanford University, 2000.
- [3]. A. Averbuch, R.R. Coifman, D.L. Donoho, M. Israeli, and J. Walden. Polar fft, rectopolarfft, and applications. Technical report, Stanford University, 2000.
- [4]. Rubegni, P. et al. (2002): Automated Diagnosis on Pigmented Skin Lesions, International Journal on Cancer, 101, pp. 576-580.
- [5]. Kopec ,D.; Kabir, M. H.; Reinharth, D.; Rothschild ,O. and Castiglione ,J. A. (2003): Human errors in medical practice: systematic classification and reduction with automated information systems, Journal of Medical Systems, U K, 27(4), pp. 297-3.
- [6]. Xia, S.; Mo, W.; Zhang , Z. (2005): A content based retrieval system for endoscopic images, Journal of Information Technology, 11(2), pp. 27-32 Anal Kumar Mitra et al. / International Journal of Engineering Science and Technology (IJEST).
- [7]. Smach, F. et. al. (2006): Design of a neural network classifier for face Detection, Journal of Computer Science, 2(3), pp. 257-260.
- [8]. Tahmoush, D. Samet, H. (2007): A Web collaboration system for content based retrieval of medical images, Proceedings of SPIE Medical Imaging – PACS and Medical Informatics, 6516, San Diego, USA.
- [9]. Blackledge, J. M.; Dubovitskiy, D. A. (2009): Texture classification using fractal geometry for the diagnosis of skin cancers, in Proceedings of EG UK Theory and Practice of Computer Graphics, UK, pp. 1-8.
- [10]. Damilola . Okuboyejo, Oludayo O. Olugbara, and Solomon A. Odunaike, "Automating Skin Disease Diagnosis Using Image Classificaion", Proceedings of the World Congress on Engineering and Computer Science 2013 Vol 2, WCECS 2013.
- [11]. C. Vinayaga Jagadeesh Raja and M. Jeyaprakash, "Skin Disease Diagnosis Using Texture Analysis", Sethu Institute of Technology and Chettinad College of Engg & Tech, India, International Journal of Advanced Research in Computer Science and Software Engineering India, Vol 4, Issue 1, January 2014 ISSN: 2277 128X.
- [12]. A.A.L.C. Amarathunga, E.P.W.C. Ellawala, G.N. Abeysekara and C.R.J. Amalraj, "Expert System For Diagnosis of Skin Diseases", Hasanuddin University, Makassar, Indonesia, International Journal of Science and Technology Research Vol 4, Issue 01, Jan 2015, ISSN 2277-86-16.



#### **AUTHOR'S PROFILE**

Dr.V.Arulmozhi, Associate Professor, Department of Research – Ph.D computer Science, Tiruppur Kumaran College for women, Tiruppur, has received best paper awards and published more journal papers, conference proceedings and guiding M.phil and Ph.D research scholars.



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