IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Skin Disease Image Recognition Using Deep Learning Techniques

[1]Anagha V P [2]Safoora O K

[1]M.Tech Student [2]Assistant Professor

[1.2]Department of Electronics & Communication Engineering

[1.2]College of Engineering Thalassery, Kannur, Kerala, India

Abstract: In the field of medicine the skin disease is one of the most common disease. The skin disease detection is a real world problem. It is a problem that's global & while technology has been incorporated into areas like cancer recognition. Skin cancer (Melanoma) also called maligant melanoma is one of the most deadly disease. As a non-trauma skin imaging technique, dermoscopy is wide spread used in the identification of the melanoma. The use of deep learning methods of skin disease image recognition is great significance. The main application of deep learning in skin disease recognition is skin disease classification. Here SVM is used for classification of malignant and benign lesions.The project basically tries to extract image from a huge data set with constraints using MATLAB coding. To find the desired result in minimum time.

Index Terms - Support Vector Machines (SVM), Melanoma, Deep learning, Dermoscopy, Benign and Malignant.

I. INTRODUCTION

Skin diseases are more common than other diseases. Skin diseases may be caused by fungal infection, allergy, bacteria or viruses, etc. A skin disease may change texture or color of the skin. In general, skin diseases are chronic, infectious and sometimes may develop into skin cancer. Melanoma can originate in any parts of the body that contain melanocytes. It is the deadliest type of skin cancer, if it is not detected and cured in early stages. Nearly 160,000 new cases found every year. Image processing is commonly used method for skin cancer detection. Here using deep learning techniques to classify the cancerous cell.

The skin is the largest organ of the body, with a total area of about 20square feet. The skin protects us from microbes and the elements helps regulate body temperature and permit the sensations of cold heat and touch. There are mainly three layers in skin. The Outermost layer namely epidermis that provide a waterproof barrier and creates our skin tone. Second dermis contains tough connective tissue, hair follicles, and sweat glands. The third one is hypodermis which is made up of fat and connective tissue. Skin cancers are cancers that originate from the skin. It is due to the development of abnormal cells. There are three types of skin cancers bascal cell skin cancer, squamous cell and melanoma.Melanoma also called maligant melanoma it is dangerous than most other types of skin cancer.If it is not detected at beginning stage ,it is quickly invaded nearby tissue and spread to other parts of the body. Formal diagnosis method to skin cancer detection is biopsy method. Generally skin cancer images are classified as benign and maligant. A breakdown of a cell layer in the epidermis an abnormal but benign thickening of the prickle cell layer of the skin. A skin disease characterized by dark wart like patches in the body can be benign or malignant. There are hundreds of skin disorders that affect human beigns. There are mainly classified as three types permanent skin diseases, temporary skin diseases, and internal skin diseases. Maligant cells are cancerous and can spread to other tissues and organs. The benign cells are not cancerous and wont spread.According to the skin cancer particularly melanoma cancer is detected in different methods. The base paper would contain the melanoma cancer detection and classification. The main steps include the study of collecting dermoscopy images as a data base, pre-processing, segmentation using thresholding, feature extraction,by using the suitable classifier like Hybrid SVM. The main aim is to determine the melanoma detection from dermoscopy images and classification using deep learning techniques.

II. LITERATURE REVIEW

The literature review mainly focuses on the concept of different skin detection and classification techniques.[1]This reference proposed a lightweight CNN skin cancer model of feature discrimination based on fine-grained classification. This includes two feature extraction model for network their model. Classification network and feature discrimination network. Based on this extraction the authors proposed a recognition model, UNet and migration training strategy. This method achieves the higher accuracy. [2] The authors describes the deep learning methods for detection of melanoma. Here used CAD as important step for automated diagnosis of melanoma. This refers the ISIC 2018 skin lesions for analysis. Here used convolutional neural network CNN for lesion segmentation. and also include the proposed techniques include VGG-19 UNet,deeplabv3+ and other methods [3]Author describes the method of vertical image segmentation for identify 3 diseases. For image pre-processing they used Euclidean distance, image rotation, image filtering. GLCM was introduced for segment the skin disease images. The texture and color features. SVM classifier are used for classification of 3 different diseases. [4]The authors proposed the advanced technology and smart phone development ,many mobile application has been detection of melanoma. By using pattern recognition algorithm by android studio software, openCV library ,java programming language. All are carried by android phone. This application is mainly a user friendly.

III. IMAGE DATA BASE

The database was generated by collecting images from different websites with category benign / malignant. These websites are specified for melanoma skin cancer. In this section, there are mainly four categories pre-processing, segmentation, feature extraction and classification of skin diseases images is described.

Figure 1:Different Skin Images(Benign and Malignant)

Take one data base as input image. This figure is an example of malignant skin lesion. Load the image represent query image and next the input image is pre-processed by contrast enhancement.

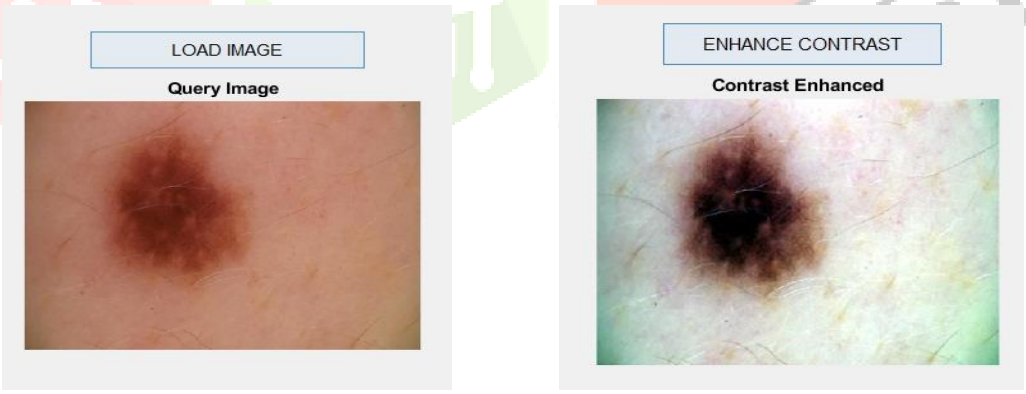


Figure 2:Input image and Pre-processing Stage

IV. CLASSIFICATION USING SUPPORT VECTOR MACHINE

In this section, there are mainly extraction and classification of skin diseases images is described. The whole architecture can be divided into several modules comprising of pre processing, segmentation, feature extraction, and classification. After applying the extracted features to the stage of classification, it classifies the skin lesion as benign and malignant by Support Vector Machine Classifier. The block diagram is shown below.

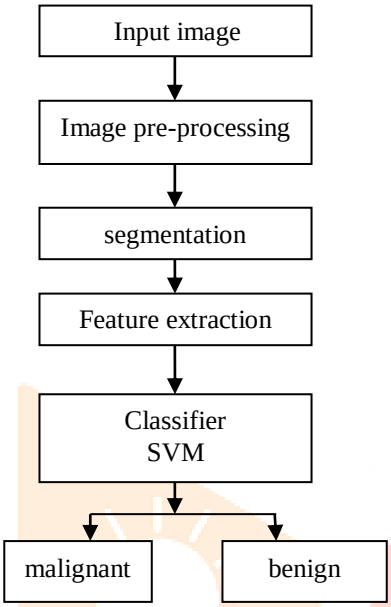
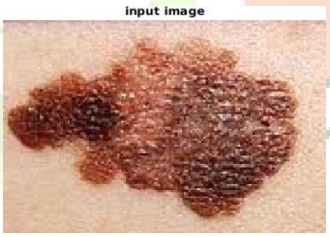


Figure3: Block diagram of proposed system

4.1 Pre-Processing

Pre-processing of the skin image is the first step in proposed technique. Usually a skin image has pathological noise and various texture backgrounds. This step converting the rgb acquired skin image to gray image, contrast enhancement, noise filtering



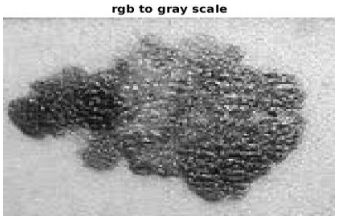


Figure 4: Pre-Processing stages in resized and rgb to gray scale image.

Image restoration classified in noise and blur. The blur may be due to a number of reasons. The noise may originate in the image formation process, transmission process, or a combination of them.

4.2 Segmentation

Segmentation was done using thresholding by firstly getting the binary form of the original image. Than converting it to gray scale than extracted the edges. There are two basic segmentation is including k means algorithm and Otsu segmentation. K-means clustering algorithm is an unsupervised algorithm and it is used to segment the interest area from the background. Otsu method is a clustering based image thresholding. The segmentation means which part is effected that part alone as to be cropped out and taken out.

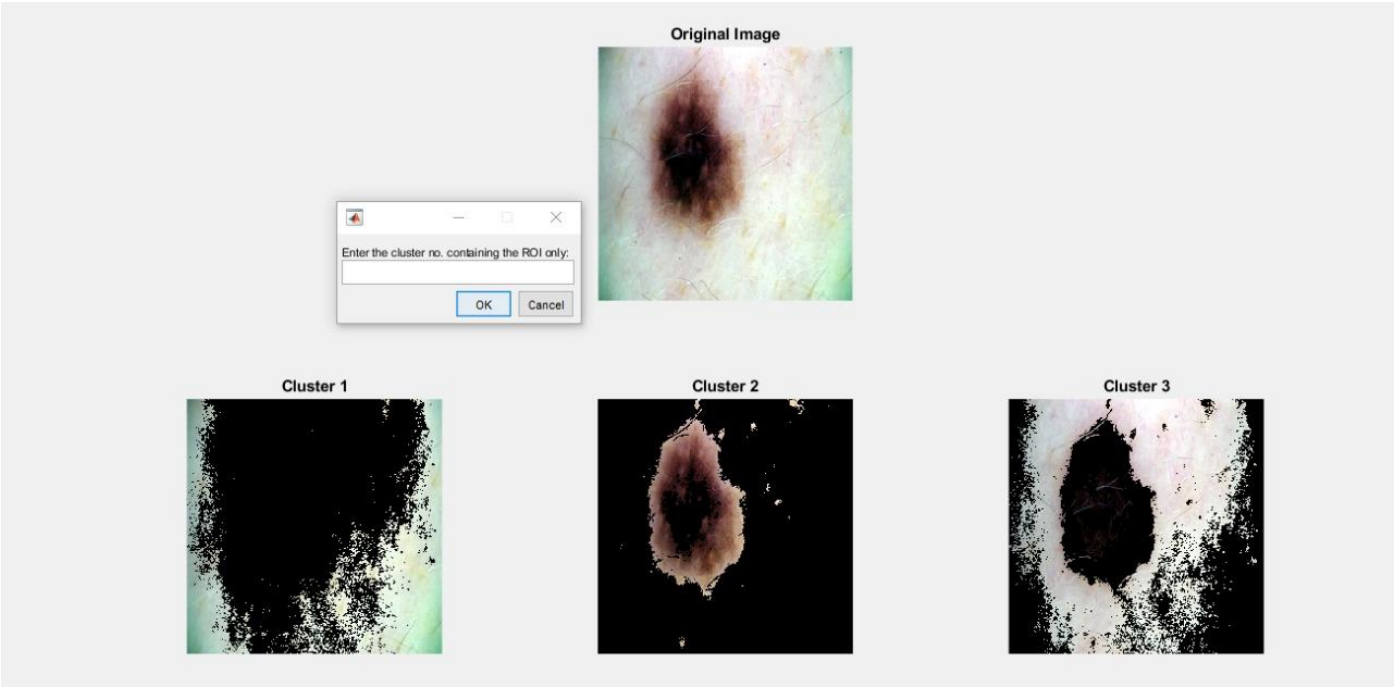


Figure 5: Segmented images

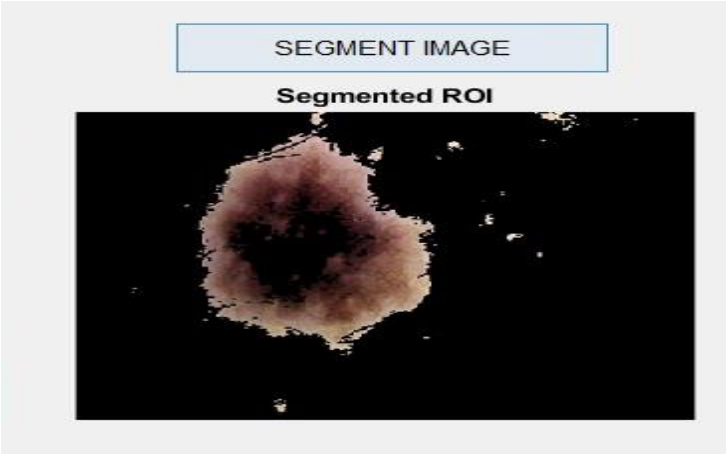
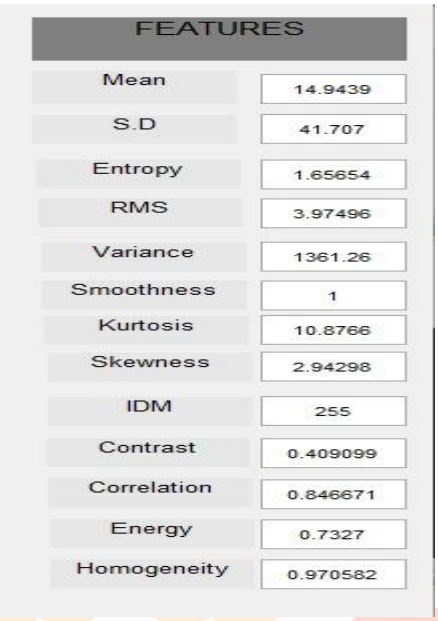


Figure6: The image which is similar to input image

4.3 Feature extraction

Feature extraction certain geometrical characteristic of the lesion can indicate the presence of melanoma skin cancer. There are lots of features such as standard deviation, mean, homogenis, variance, smoothness, kurtosis, skewness, contrast etc. From this I am selecting the best 4 features with maximum efficiency. All the features are with respect to the skin feature. Compare to the normal region future cell is different.



4.4 Classification

There are different types of classifiers are there, namely bade classifier, SVM classifier, knn, deep neural network, artificial neural network, convolutional neural network. Among these SVM is the best technique for implementing the judgement of melanoma skin cancer. Here using Hybrid SVM for classification of skin lesions. Skin cancer detection using SVM is basically defind the which cell is malignant or which one is benign.

SVM is a supervised machine learning algorithm which is mainly used to classify data into different classes. It is considered a good classifier because of its high generalization performance. For linearly separable data set, a linear classification function corresponds to a separating the two. SVM were initially developed for binary classification. But it could be efficiently extended for multiclass problems.

The SVM nature to improve the accuracy. By using Hybrid SVM classification and achieving 95% of result.Which is used to classify the cancer cell more accurately.

V. CONCLUSION

In this project determine the melanoma detection and classification from dermoscopy images by using suitable classifier. The input images are subjected to pre-procssing techniques such as resizing, contrast enhancement and rgb conversion etc. Than the steps of segmentation and feature extraction are also done. Next stage is going to classification by using suitable classifier like Hybrid SVM . Here MATLAB is used for implementing this project.

REFERENCES

[1] Lisheng we,kun ding,huosheng hu,"automatic skin cancer detection in dermoscopy imags based on ensemble lightweight deep learning network",IEEE-2020

[2] R. Ali, R. C. Hardie, B. Narayanan Narayanan and S. De Silva, "Deep Learning Ensemble Meathods for Skin Lesion Analysis towards Melanoma Detection," 2019 IEEE National Aerospace and Electronics Conference (NAECON), 2019, pp. 311-316, doi: 10.1109/NAECON46414.2019.9058245

[3] Li-sheng wei , quan gan, and tao ji , "skin disease recognition method based on image color and Texture features" hindawi computational and mathematical methods in medicine volume 2018, article id 8145713,10 pages

[4] S. M. Alizadeh and A. Mahloojifar, "A Mobile Application for Early Detection of Melanoma by Image Processing Algorithms," 2018 25th National and 3rd International Iranian Conference on Biomedical Engineering (ICBME), 2018, pp. 1-5, doi: 10.1109/ICBME.2018.8703575.