

Review Paper on Implementation on Skin Disease Detection Model using Machine Learning Technique

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Abstract—Skin diseases are more common than other diseases. Skin Diseases may be caused by fungal infection, bacteria, allergy or viruses etc. The advancement of lasers and Photonics based medical technology has made it possible to diagnose the skin diseases much more quickly and accurately. But the cost of such diagnosis is still limited and very expensive. So, image processing techniques help to build automated screening system for dermatology at an initial stage. The extraction of features plays a key role in helping to classify skin diseases. Computer vision has a role in the detection of skin disease in a variety of techniques.

Keywords- Image processing technique, skin disease,

I. INTRODUCTION

Due to deserts and hot weather, skin diseases are common in Saudi Arabia. This work contributes in the research of skin disease detection. We proposed an image processing-based method to detect skin diseases. This method takes the digital image of disease effect skin area, then use image analysis to identify the type of disease. Our proposed approach is simple, fast and does not require expensive equipment other than a camera and a computer. The approach works on the inputs of a colour image. Then resize of the image to extract features using pertained convolutional neural network. After that classified feature using Multiclass SVM. Finally, the results are shown to the user, including the type of disease, spread, and severity. The system successfully detects 3 different types of skin diseases with an accuracy rate of 100%.

As you know, approximately eight million people in the UK currently suffered from skin disease. Skin disease doesn't just damage the skin. It can have a large impact on human's daily life [8], destroy confidence of a person, stop their movement, and turn to depression. The worst situation is that, it can even kill. It's a serious issue that needs to be controlled, so it is necessary to take skin diseases very seriously and identify it at an early stage and

prevent it from spreading. Detection of a disease depends upon many factors like which parameters are considered for disease detection. Firstly, take an image, apply filters to remove noise from the image, segment the image to extract meaningful information, feature extraction is done on the basis of input parameters and then classify the diseases by using appropriate classifier.

The biggest organ of the body is human skin. Its weight lies between six and nine pounds and surface area is about two square yards. Inner part of body is separated by skin from the outer environment. It provides protection against fungal infection, bacteria, allergy, viruses and controls temperature of body. Situations that frustrate, change texture of the skin, or damage the skin can produce symptoms like swelling, burning, redness and itching. Allergies, irritants, genetic structure, and particular diseases and immune system related problems can produce dermatitis, hives, and other skin problems. Many of the skin diseases, such as acne, alopecia, ringworm, eczema also affect your look. Skin can also produce many types of cancers. Image processing is used to detect these diseases by using various methods like segmentation, filtering, feature extraction etc.

Skin diseases have a serious impact on the psychological health of the patient. It can result in the loss of confidence and can even turn the patient into depression. Skin diseases can thus be fatal. It is a serious issue and cannot be neglected but should be controlled. So, it is necessary to identify the skin diseases at an early stage and prevent it from spreading. Human skin is unpredictable and almost a difficult terrain due to its complexity of jaggedness, lesion structures, moles, tone, the presence of dense hairs and

other mitigating confusing features. Early detection of skin diseases can prove to be cost effective and can be accessible in remote areas. Identifying the infected area of skin and detecting the type of disease is useful for early awareness. In this paper, a detection system is proposed which enables the user.

II. LITERATURE REVIEW

A Literature Review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books and other sources relevant to a particular area of research. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources and do not report new or original experimental work. Most often associated with academic- oriented literature, such reviews are found in academic journals and are not to be confused with book reviews that may also appear in the same publication.

The amalgamation of technology with health care results in rapid development in image processing techniques to aid the medical field. Application of digital image-based equipment such as Computed Tomography (CT), Digital Subtraction Angiography (DSA), and Magnetic Resonance Imaging (MRI) help in accurate diagnosis. Many researchers have worked for detection of skin diseases so far. A brief literature survey is given below. Recall et al. [1] used an adaptive colour metric from the RGB planes. It helps in discriminating the tumor and the background. Image segmentation is performed using a suitable coordinate transformation. Borders are range extracting the tumor portion from the segmented image. This was an effective method to find tumors tumors et al. [2] used deep convolutional neural networks, image classification algorithms with data augmentation to successfully investigate automatic detection of thermoscopic patterns and skin lesion analysis. Gangster et al. [3] developed a computer-based system for image analysis acquired through ELM. Basic segmentation algorithms with fusion strategy are used to get the binary mask of skin lesion. The malignancy of Lesion is calculated based upon shape and radiometric features. The local and global parameters are also considered for better results.

The system improves the early detection of malignant melanoma. Grana [4] provided a novel mathematical approach to assess the lesion boundary. The approach considers luminance values along a direction normal to the contour at each point. Sigurdsson et al. [5] classified skin lesion based on in vitro Raman spectroscopy. They used a nonlinear neural network

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classifier for their work. Unique bands in spectrum show explicit lipids and proteins which provides information to diagnose skin lesions. Aberg et al. [6] uses electrical bio-impedance to assess skin cancers and lesions. Multi-frequency impedance spectra are used to separate skin cancer and benign nevi. Wong et al. [7] proposed a novel iterative stochastic region-merging approach to segment skin lesion regions from the macroscopic images. In this approach initially, stochastic region merging is performed on a pixel level, and afterwards on a region level until convergence. Wighton et al. [8] Performed automated skin lesion diagnosis. A model based on supervised learning and MAP estimation are presented for the diagnosis. Emre Celebes et al. [9] Uses ensembles of thresholding methods to detect lesion borders in et al. Loyola and Arroyo [10] collected and classify an image of varicella through Hough transform and applied the color transformation, equalization and edge detection techniques of image processing. It helps in better diagnosis of varicella detection. Hung and Shapiro [11] suggested a method for skin lesion detection built on a partial differential equation. Based upon the morphological filtering through PDE, a contour model of lesions was taken out. It helps in accurately identifying the disease. Three-dimensional computed tomography (CT) imagological technique was applied by Zhong et al. [12]. The technique diagnosed psoriasis vulgaris with high sensitivity and specificity. An innovative approach for auto segmentation and classification of skin lesion was given bismuthal et al.

III. CONCLUSION

Detection of skin diseases is a very important step to reduce death rates, disease transmission and the development of the skin disease. Clinical procedures to detect skin diseases are very expensive and time-consuming. Image processing techniques help to build automated screening system for dermatology at an initial stage.

The extraction of features plays a key role in helping to classify skin diseases. In this research the method of detection was designed by using pretrained convolutional neural network (Alex Net) and SVM. In conclusion, we must not forget that this research has an effective role in the detection of skin diseases in Saudi Arabia because it has a very hot weather for the presence of deserts; this indicates that skin diseases are widespread.

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