Skin Disease Detection System

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Abstract:- The skin is the largest organ of our human body and acts as protective covering around our body. It has multiple other components and layers. Skin diseases are more common than any other diseases and have many chances of occurrence. The purpose of this review is to identify and analyze multiple skin related diseases and problems and to make their recognition easier and accessible. With the Skin disease detection system, the skin diseases can be identified easily and at an early stage so that their proper treatment can be initiated accordingly. The images of the infected skin areas will be used for disease identification and further processing.

Keywords:- Skin, Diseases, Largest Organ, Detection, Image Processing.

I. INTRODUCTION

The human body is made up of several organs. Skin is one of them. It is the largest organ covering the entire human body. Any disorder that affects human skin is called skin disease. Skin disease is one of the most contagious diseases in the world. It is the change of color or texture of the skin. The causes of skin diseases are viruses, bacteria, allergy, or fungal infections. The genetic factor also causes skin disorders. Generally, skin disease occurs in the thin outer layer of the skin, called epidermis can be visualized by human eyes that cause psychological depression and lead to physical injuries. There are different types of skin lesions: Actinic keratosis, Basal cell carcinoma, Lesions, Rashes, Infections Cuts etc.

➢ *Objectives*
- To develop an automatic classification model for skin diseases classification based on a sufficient number of relevant features with high accuracy.
- To solve the basic problem of skin disease detection and also to get everyone avail the information and awareness about such skin diseases.
- Identify the forms of skin cancer including symptoms and mortality rates.

II. RELATED WORK

In the field of Medical Sciences and Dermatology (study of skin organ) in particular, there have been multiple times researches and experiments are done in order to identify a particular skin diseases. Dermatologists in particular take the skin samples and identify the disease type after proper lab tests. It also includes the use of Blood samples sometimes to examine the type of infection to the skin. There is a massive gap between dermatologists and skin disease patients as many people do not know the types, symptoms, and stages of skin disease. Sometimes it requires a long time to show the signs. For this, it requires early and quick detection. But it may be difficult and expensive to diagnose skin diseases correctly to identify the type and stage of the disease. The automatic computer-aided system based on machine learning approaches has made it possible to detect the types of skin disease more accurately and quickly.

The incidence of skin Diseases increasing due to the following factors-

- Faulty diet and daily regime; taking of incompatible and unwholesome foods; taking of meals before the previous meal has been digested; taking milk along with meats, fish (aquatic animals); bathing immediately after exposure to the sun or after physical exertion) etc.
- Excessive and improper use of chemicals, cosmetics, soap, shampoo, deodorants etc.
- Unhygienic practices
- Unnecessary and Overuse of antibiotics and Steroids.

It is made up of three layers : The epidermis, dermis and the hypodermis, all three of which vary significantly in their anatomy and function. The skin's structure is made up of an intricate network which serves as the body's initial barrier against pathogens, UV light, and chemicals, and mechanical injury. The thickness of each layer of the skin varies depending on body region and categorized based on the thickness of the epidermal and dermal layers. Whether it's rashes, wrinkles, psoriasis, or melanoma, no one understands your skin, hair, and nails better than a board-certified dermatologist.
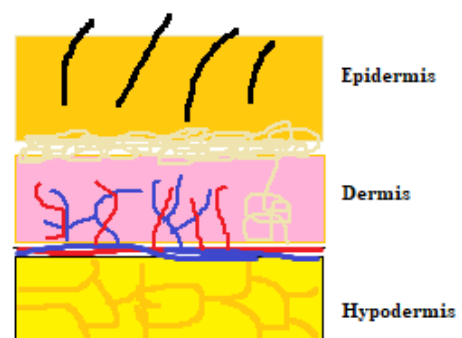

Fig.1- Layers of Skin

The fundamental factors of Skin Disease Detection System are the accurate identification of the skin disease by input images.

III. PROPOSED METHODOLOGY

The mission of the project is to advance medical knowledge from research to patient care, making the connections between developments in clinical science and clinical practice to improve healthcare quality and patient outcomes by helping clinicians efficiently understand medical developments. The system aims to publish basic, fundamental, critical, and state of the articles in the field of skin diseases, pathophysiology, treatment, cosmetology, surgery, medicine and herbology. Insight medical publishing felt that there is a need for a single publishing platform covering entire spectrum of skin diseases and care. Acne, shingles, haemangioma, skin cancer, mouth ulcers, rosacea, rubeola, lentigo maligna, cutaneous melanoma herpetic whitlow latex allergy malignant melanoma. We used an automatic segmentation algorithm that sometimes does not detect the skin lesion correctly. As a result, it leads to misclassification, which is the limitation of our study. With the support of more efficient segmentation and classification techniques such as ensemble learning and deep learning techniques, future research will focus on real-time skin disease detection. In addition, we believe that it will increase the performance and accuracy of image classification and object detection systems algorithms. We hope it will be useful for the patients for an early detection of diseases to keep their skin healthy.

> *Proposed Architecture*

The skin disease detection system will enable to improve the medical treatment facilities regarding the field of Dermatology and Medical Sciences Researches. Here the input data will be of the form Raw Images (datasets format also). Image processing is used in pattern recognition to identify the items in an image, and machine learning is then used to train the system to recognize changes in patterns. Pattern recognition is utilized in computer assisted diagnosis, handwriting recognition, image identification, character recognition etc. The Images of the to be detected diseases will be processed here in order to generate the fulfilling output.

By further processing the output we can reach the maximum accuracy. Allocating resources in order to keep at minimum CPA – cost per acquisition and, at the same time, to increase return is one of the primary difficulties that marketing teams must overcome. Segmentation, the technique of splitting customers into separate groups depending on their attributes or behavior, makes this possible. The entered image will be further processed primarily via the segmentation and Classification techniques. The Classification algorithm is a Supervised Learning technique that is used to identify the category of new observations on the basis of training data.

In Classification, a program learns from the given dataset or observations and then classifies new observation into a number of classes or groups. Such as, Yes or No. By the classification technique, we will be classifying the system according to the disease present or not in the inputted data. Data mining is a popular and multidisciplinary field that mainly focuses on finding useful information from a large volume of data. Machine learning (ML), on the other hand, is a subset of data science. ML primarily focuses on creating algorithms that can learn and predict from given data. From the usable data mining techniques, we can further find most of the information from the given dataset and utilize the increment in System performance.
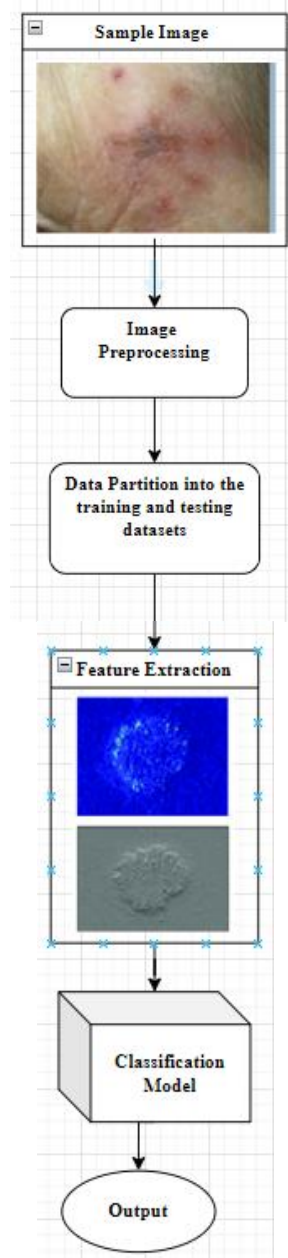
The process of segmenting an image into non-overlapping groups or regions is known as image segmentation. It is based on gray level, brightness, color, contrast, texture, and other properties. It separates the identical lesions from the healthy skin around them. It is the most crucial step in effectively evaluating images because it influences the accuracy of the subsequent processes.

Feature extraction is essential for studying and discovering the underlying relationships between various objects. The image categorization, prediction, and recommendation algorithms cannot comprehend the images directly. As a result, feature extraction is necessary to convert them into usable forms. The dermoscopic image has various characteristics that are utilized to describe the image. However, not all characteristics apply to

the categorization of skin disease. The final task of the work is classification. It is the process of classifying a set of data into several categories. This work predicted the type of skin disease using the features extracted from images. Depending on the application and the given dataset's type, several methods are employed for classification. In this work, we utilized three distinct classifiers: Support Vector Machine (SVM), K Nearest Neighbor (KNN), and Decision Tree (DT) for the categorization of skin disease.

IV.   FUTURE SCOPE AND CONCLUSION

The mission of the project is to advance medical knowledge from research to patient care, making the connections between developments in clinical science and clinical practice to improve healthcare quality and patient outcomes by helping clinicians efficiently understand medical developments. The system aims to publish basic, fundamental, critical, and state of the articles in the field of skin diseases, pathophysiology, treatment, cosmetology, surgery, medicine and herbology. Insight medical publishing felt that there is a need for a single publishing platform covering entire spectrum of skin diseases and care. Acne, shingles, haemangioma, skin cancer, mouth ulcers, rosacea, rubeola, lentigo maligna, cutaneous melanoma herpetic whitlow latex allergy malignant melanoma.

With the support of more efficient segmentation and classification techniques such as ensemble learning and deep learning techniques, future research will focus on real-time skin disease detection. In addition, we believe that it will increase the performance and accuracy of image classification and object detection systems algorithms. We hope it will be useful for the patients for an early detection of diseases to keep their skin healthy.

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