LITERATURE SURVEY

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[1] **AI-based localization and classification of skin disease with erythema**

Although computer-aided diagnosis (CAD) is employed in a number of medical specialties, including colonography and mammography, where noninvasive screening procedures are carried out solely with the naked eye and there is a possibility of preventable inaccuracy, it is not utilized in dermatology. This paper presents a novel way to successively combine precise segmentation and classification models, demonstrating that CAD may also be a feasible choice in dermatology. They dissect an image of the skin in order to extract high-level features and normalize the image. Here they first construct a segmented map of the image using a neural network-based segmentation model, after which we group the areas of aberrant skin and feed this data to a classification model. The suggested classification model can classify numerous diseases in a single image and is more accurate than a baseline model trained without segmentation. The field of dermatology may be able to apply CAD with this better performance.

[2] **Intelligent Segmentation and Classification of Pigmented Skin Lesions in Dermatological Images**

In recent years, computer vision-based diagnostic systems have been utilized in a number of hospitals and dermatology clinics with the primary goal of detecting skin cancers early, particularly malignant melanoma tumors, which are among the most common types of skin cancer. The segmentation and categorization of pigmented skin lesions in such dermatological images using intelligent algorithms is covered in this work. Following the proposal of a local thresholding algorithm for the separation of skin lesions, border, texture, and color-based features are derived from the digital pictures. A classification module based on Support Vector Machines (SVM) is built using extracted information to distinguish between malignant melanoma and dysplastic nevus.

[3] **SMOTE: synthetic minority over-sampling technique**

It is described how to create classifiers from datasets with imbalances. If the categorization categories are not roughly equally represented, a dataset is unbalanced. Real-world data sets frequently contain a large percentage of "regular" cases and a very

small number of "abnormal" or "interesting" examples. The cost of misclassifying an abnormal (interesting) example as a normal example is also true, and it is frequently much larger than the cost of the opposite error. A useful way to improve a classifier's sensitivity to the minority class has been suggested: under-sampling the majority (normal) class . This study also demonstrates that combining our strategy of under- and over-sampling the majority class can lead to higher classifier performance (in ROC space) than adjusting the loss ratios in Ripper or the class priors in Naive Bayes. We oversample the minority class by generating artificial minority class examples. Using C4.5, Ripper, and a Naive Bayes classifier, experiments are carried out.

[4] **Skin disease analysis and tracking based on image segmentation**
Tracking skin conditions is an essential part of the diagnostic process, and measuring the wound's surface is helpful for keeping track of the healing process. We suggest an unique method designed to cut down on time and error in order to address the challenges associated with measuring skin illnesses that are present with the current assessment methodologies. The suggested approach consists of two processes; the first is a preprocessing step that involves picture segmentation to find the margin of the skin region that is diseased. In the second, a different suggested method is used to gauge the wound's "size" and manage the progression of the sickness. In this work, a comparative research was carried out to determine the best segmentation method based on an edge accuracy-based EAC suggested criterion. The surface accuracy based on ROC1 space was compared to the new criterion. The results of the trials demonstrate the performance of the suggested criterion and the effectiveness of the measurement method.

[5] **AI-based localization and classification of skin disease with erythema**

Computer-aided diagnosis (CAD) is used to improve the quality of diagnosis in various medical fields such as mammography and colonography. This study shows that CAD may also be a viable option in dermatology. Given an image of the skin, we decompose the image to extract high-level features. We then cluster sections of abnormal skin and pass this information to a classification model. Our classification model is more accurate than a baseline model trained without segmentation. The segmentation and classification of skin diseases has been gaining attention in the field of artificial intelligence. Clustering algorithms rely on the identification of a centroid that can generalize a cluster of data. Support vector machines (SVMs) are more reliant on the preprocessing of data for feature extraction. Convolution neural networks (CNNs) have gained popularity because of their ability to extract high-level features with minimal

preprocessing. Although down-sampling allows CNNs to view an image in its own context, it degrades the resolution of the image. By learning to create a higher-resolution image, CNNs can determine the location of the targets to segment.We have shown that even without a large dataset and high-quality images, it is possible to achieve sufficient accuracy rates. With higher quality and a larger quantity of data, it will be viable to use state-of-the-art models to enable the use of CAD in the field of dermatology.

[6] **The mathematics of erythema: Development of machine learning models for artificial intelligence assisted measurement and severity scoring of radiation induced dermatitis**

The objective of this single-center study was to develop machine learning and deep learning approaches for automatic classification of RISRs. Scarlet Vision, a novel and state-of-the-art digital skin imaging method capable of remote monitoring and objective assessment of acute RISRs was used to convert 2D digital skin images using the CIELAB color space and conduct SEV* measurements. A set of different machine learning and deep convolutional neural network-based algorithms has been explored for the automatic classification of RISRs total of 2263 distinct images from 209 patients were analyzed for training and testing the machine learning algorithms. For a 2-class problem of healthy skin (grade 0) versus erythema (grade ≥ 1), all machine learning models produced an accuracy of above 70%. For estimating the severity grade of each class, the CNN obtained an overall accuracy of 66%. Ensemble learning combines several individual predictions to obtain a better generalization performance.

[7] **Skin Diseases Classification Using Hybrid AI Based Localization Approach**

One of the most prevalent diseases that can be initially identified by visual inspection and further identified with the use of thermoscopic examination and other testing is skin cancer. Since eye observation provides the earliest opportunity for artificial intelligence to intercept various skin images, some skin lesion classification algorithms based on deep learning display improved outcomes. The image processing techniques are involved in the following ways, namely, the given input data sets go through the preprocessing techniques, these techniques are handled by using the median filter in our proposed approach, the preprocessing techniques are helping to remove the noise in the images, the median filter removes the salt and the pepper noise in the given input images.It implements the proposed approach for the skin diseases classification, and our proposed method implements the median filter for the preprocessing technique. The combination of the feature extraction In SCM and the classification in ECNN shows better accuracy when compared to the existing techniques. Preprocessing filter helps to

remove the noise in the entire image, thus it provides a better quality of the image to the segmentation process.

[8]**Skin Disease Classification from Image - A Survey**

Identification of skin diseases mostly relies on the expertise of the doctors and skin biopsy results. Classification of skin disease from an image is a crucial task and highly depends on the features of the diseases considered in order to classify it correctly. Many skin diseases have highly similar visual characteristics, which add more challenges to the selection of useful features. This paper presents a survey of different methods and techniques for skin disease classification. This paper presents the survey of traditional or feature extraction based and CNN based approach for skin disease classification. Pre-trained models like Inception v3, reset, VGG16, VGG19, Alex net etc are trained on very large dataset.

Citation

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