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Survey On Skin Disease Detection UsingImage Processing Technique

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ABSTRACT
Certain lifestyle factors can lead tothe development of a skin disease. Skin disease symptoms vary significantly, depending on what condition you have. Skindisorders vary greatly in symptoms and severity. They can be temporary or permanent, and may be painless or painful. Some have situational causes, while others may be genetic. While most skin disorders are minor, others can indicate a more serious issue. This paper focuses on classification of mainly 5 skin diseases. They are Eczema, Melanoma, Psoriasis, Vitiligo and Atopic Dermatitis. In this paper, image processing techniques like adaptive thresholding, edge detection, K-means clustering and morphology-based imagesegmentation have been used to identify the skin diseases from the given image set. The pre-processing of these collected dataset is performed. The main step is feature extraction from these images. This is done using Convolutional Neural Network (CNN), Probabilistic Neural Network (PNN), Support Vector Machine (SVM), K Means and K-Nearest Neighbors (KNN).The classification is done using CNN where Alex Net, MobileNet-V2 are used.
Keywords – Convolutional Neural Network, Probabilistic Neural Network, Support Vector Machine, K Means, K-Nearest Neighbors.

I. INTRODUCTION

People of all ages are affected by skin diseases. Skin illness has become more common as a result of changing lifestyles and settings. In the United States, it is estimated that one out of every five people is affected with a skin condition. Skin disorders were the fourth greatest source of nonfatal disease burden in 2010, according to a report, and three of the world's most frequent diseases were skin diseases. Skin illnesses have wreaked havoc on economies in both high- and low-income countries. Skin disorders can have a negative impact on all parts of life, including interpersonal connections, work, social functioning, physical activity, and mental health, depending on the individual. Skin diseases commonly result in lesions, scales, and plaques on the skin the patient's skin has pigmentation and other signs. Long-term agony and disfigurement are the result of these symptoms. Such damage not only harms one's physical health but also contributes to major mental health issues, particularly when it occurs on the face. Patients with primary skin illnesses have a higher risk of mental problems like anxiety and depression, according to studies. As a result, skin illnesses must be recognized early in order to prevent their progression and spread. A skin illness requires more time to diagnose and treat.

They are usually caused by internal and external factors such as the hierarchical geneticgroup of cells, hormones, and immune system of conditions, as well as factors such as different organism's cells, a different diet, and internal and external factors such as the hierarchical genetic group of cells, hormones, and immune system of conditions. These elements may operate in concert or in a specific order to cause skin disease. Eczema and psoriasis are chronic and incurable diseases, as are malignant disorders like malignant melanoma. Many research papers have been published and many researchers have contributed to the detection of various diseases using image processing methods, which prepared the way for our application and pointed us in the right direction. SVM always demands clean data as an input. The challenge with skin illness detection is classifying photos into distinct categories of skin diseases. Using technology to diagnose patients allows doctors to see more patients and diagnose with fewer errors. Using image processing techniques, the proposed work seeks to recognize and classify skin diseases seen in the human body. This paper uses a Convolutional Neural Network to extract diverse skin illness photos from the Derma Net database and identify the disorders. Deep learning algorithms have attained human-level performance in many sectors, thanks to the availability

of enormous amounts of data givenby the Internet and the improvement of processing power offered by improved technology. Convolutional neural networks (CNNs), for example, have achieved numerous improvements in medical image processing, particularly for pathology, CT, and MRI images, which contain stiff characteristics and great resolution. However, there is a scarcity of study on clinical images. As a result, clinical images are constantly surrounded by acomplex environment.

The majority of ordinary people are unaware of the type and stage of a skin illness. Some skin illnesses manifest signs monthslater, causing the condition to progress and spread. This is owing to the general public's lack of medical expertise. A dermatologistmay find it challenging to diagnose the skin illness, necessitating the use of costly laboratory tests to correctly identify the kind and stage of the disease. Medical technology based on lasers and photonics has made it possible to identify skin illnesses considerably more rapidly and correctly. However, the cost of such a diagnosis is currently limited and prohibitively high. As a result, here is a skin disease diagnosis method based on image processing. This method uses image analysis to determine the type of disease by taking a digital photograph of the diseased skin area. Other than a camera and a computer, our proposed method is simple, quick, and does not necessitate expensive equipment.

II. LITERATURE SURVEY

Several researchers have proposed image processing-based techniques to detect the type of skin diseases. Here is a brief review of some of the techniques are reported in the literature. In this system, the dissection of skin diseases using color images without the need for doctor intervention. The system consists of two stages, the first stage is the detection of infected skin by using color image processing techniques, k means clustering and color gradient techniques to identify the diseased skin and the second the classification of the disease type using artificial neural networks. Medical technology based on lasers and photonics has made it possible to identify skin illnesses considerably more rapidly and correctly. However, the cost of such a diagnosis is currently limited and prohibitively high. This method uses image analysis to determine the type of disease by taking a digital photograph of the diseased skin area. Other than a camera and a computer, the proposed method is simple, quick, and does not necessitate expensive equipment. As a result, image processing techniques aid in the development of an automated dermatology screening system at an early stage. This work contributes to skin disease detection research. An approach based on image processing is utilized to diagnose skin disorders in this paper. This method uses image analysis to determine the type of disease by taking a digital photograph of the diseased skin area. The method is applied on the inputs of a color image. Then, using a pretrained convolutional neural network, resize the image to extract features. The feature was then categorized using Multiclass SVM. Pretrained convolutional neural networks (AlexNet) and SVM were used to build the detection method in this study. The technology correctly detects three different forms of skin diseases with a 100% accuracy rate [1].

Infections of the skin, hair, and nails caused by dermatophytes are quite prevalent and have a wide range of symptoms. This paper describes the creation of an Android application for detecting skin illnesses such as Vitiligo and Ringworm. Vitiligo is very common in India, with prevalence rates ranging from 0.46 percent to 8.8 percent. Ringworm is thought to affect up to 20% of the population, according to studies. Based on the photograph and symptoms provided by the user, the system will generate a report showing whether the condition is positive or negative, and will recommend short home remedies as well as a visit to a dermatologist intheir city. This research provides an image analysis system for diagnosing skin illnesses such as vitiligo and ringworm utilizing a client side mobile application that allows users to upload images and receive results in the form of a report generated by Image Processing programmed on the admin side. The report generated by the system will advise the patient to visit the dermatologist and also few quick healthy home remedies which patient can perform at home. For the design and development of the android application, the requirements are - Software Requirement: IDE for Image Processing Python Programs, Datasets: A total of 58 images of Vitiligo Affected Images from open Sources like dermatology atlas and Kaggleand a total of 84 images of Ringworm Affected Images from open Sources like medindia.net, Firstpot.com, webmd.com and Kaggle. In brief, the steps performed to identify the vitiligo and ringworm patches are: First, the original image is converted into grayscale using the OpenCV

methods. After converting to Grayscale, perform image pixel enhancement using Gaussian Blur method. This method blurs the image to get more details from the image. Once the image enhancement is done, the erode method is used to remove the noise that is the patches below the threshold value and the dilate method improves the detection of image [2].

In this paper, a transfer learning model is developed. For feature extraction the VGG- 16-layer CNN architecture is developed. This can extract 1000 features from the input image. A text file contains the feature with labels been performed manually for all the images Any supervised type of machine learning algorithm can be easily applied to perform the classification task. Machine Learning algorithms are used for classification such as Support vector machine, Decision tree linear regression, K-Nearest Neighbor algorithm. The performance of all the classifiers is examined based on the confusion matrix and ROC curve. Transfer learning model is used by two different levels of setup. The first setup - to extract the low-level, middle-level and high-level features from the input dataset, for which the VGG-16 model is used for deep learning. The second setup - the labels are inserted into the features extracted from the various input images of stage1. All the features are sent to the supervised machine learning model to perform the classification. In this paper, the use of the transfer learning approach may increase the classification accuracy up to the signature mark. The same data is applied into a pure deep learning model; the accuracy was slightly less than the transfer learning model. The execution time of the transfer learning model is observed more than the deep learning models and also needs some human intervention during the labeling of data. Experimental results show that the accuracy of some models like decision tree, K nearest neighbor are more than 99 % in many iterations. Whereas the performance of complex models like ensemble learning using boosted trees is not up to the mark which is less than 50% [3].

This paper deals with five mainstream CNN algorithms that have been pre trained on ImageNet. These five structures include ResNet-50, Inception-v3, DenseNet121, Xception and Inception-ResNet-v2. ResNet adds connections between the shallow and deep layers of the network. Such connections directly transmit the information of the shallow layer to the deep layer. On the other hand, the propagation of the gradient to the shallow layer during backpropagation greatly increases the number of network layers. The basic module of the Inception structure is the inception block. There are different kernels in a block, and each type of kernel has a different shape; the output of the block is combines the output from different kernels. This improves the diversity of the network in terms of width and the diversity of the scale of the receptive field. Therefore, the model improved its recognition performance for objects with different sizes. DenseNet adds connections between each two layers; that is, the output feature maps of each layer will be used as the input for all subsequent layers. Using these dense connections, the network reuses features, thereby improving performance with fewer parameters, which makes the calculation more efficient.Xception is an updated version of the Inception structure. Xception improves the Inception module with a depth wise separable convolution. This change decouples spatial correlations and cross-channel correlations. It can obtain a better performance than Inception-v3 with the same parameters. To some extent, Inception-ResNet is a combination of Inception and ResNet structures. By adding a residual connection to the Inception network, it can train deeper networks while maintaining the scale diversity of the network, thereby enhancing the performance. Based on the dataset, experiments were carried out on 5 different CNN structures to verify whether these methods can effectively diagnose facial skin diseases using clinical images. In the test set consisting entirely of facial images, the structure named Inception-ResNet-v2 achieved the highest average precision (77.0%) [4].

The outer integument of the human body is skin. The skin pigmentation of human beings varies from person to person and human skin type can be dry, oily, or combination. Melanocytes in the human skin produce melanin which can absorb harmful ultraviolet radiation from sunlight which can damage the skin and result in skin cancer. The necessary tools needed for early detection of these diseases are still not a reality in most third world communities. If the symptoms of skin diseases such as acne, dermatomyositis, candidiasis, cellulitis, Scleroderma, chicken pox, ringworm, eczema, psoriasis, etc. are left untreated in its early stage then they can result in numerous health

complications and even death. Image segmentation is a technique which aids with the detection of these skin diseases. In this paper, image processing techniques like adaptive thresholding, edge detection, K-means clustering and morphology-based image segmentation have been used to identify the skin diseases from the given image set. The acquired image set was pre-processed by deblurring, noise reduction and then processed. Depending on the definite pattern present in the processed image the disease is detected at the output for a corresponding input image. This paper performs four segmentation techniques on certain skin diseases namely- eczema, psoriasis, chicken pox and ringworm. The proposed method improves the segmentation using OpenCV with the help of python in separating the image on the basis of edge detection or region detection. For the four different disease images, four segmentation techniques are used and the resultant images are produced on the basis of Signal to Noise Ratio. The segmentation techniques show promising results differently for the four categories of diseases. In the case of chickenpox adaptive thresholding is the best method. For eczema k-means clustering is the best method. Morphology based segmentation is the best method for detecting psoriasis. In case of ringworm disease edge detection is the best method. However, at a large the applied segmentation procedure could be more efficient if it is coupled with the classification of the diseases, so as to act as a support to the clinicians for the analysis of the dermatologists [5].

Skin cancer is considered one of the life-threatening types of cancer found in human beings. Skin cancer is detected in the number of types such as Melanoma, Basal and Squamous cell Carcinoma from these the Melanoma is an uncertain style of cancer. Melanoma, a kind of skin cancer, could be a category of cancer that originates from the pigment which includes the cells called melanocytes. Melanomas normally appear within not only the skin, but also may rarely occur within the eyes, intestines, or mouth. In women melanomas are most ordinarily found on the legs, on the other hand in men, they are most typical on the rear side. Generally, these are originated from a mole with regarding changes as well as increase in classify skin size, asymmetrical edges, and modification in skin breakdown, itchiness, or color. Melanoma is one of the life-threatening kinds of carcinoma. There is an increase in incidence rates of skin cancer. This paper takes the help of the image processing techniques for detecting melanoma in the image. Firstly, applies the preprocessing technique in order to make the image noise free. Median filters will be used for filtration of the image. After that, will transform the image into an HSI color image. Active shape segmentation and texture segmentation techniques will be used for segmenting the image. For feature extraction, the GLCM Feature Extraction algorithm is used. Finally, probabilistic neural network (PNN) classifier is applied to classify the image either as normal or melanoma. This research proposes a computer-aided diagnosis system for the detection of skin cancer lesions. Pre-processing is done with the median filter and HSI color code conversion and segmentation part with active shape segmentation algorithm and texture segmentation algorithm, the GLCM algorithm for feature extraction of skin lesions. The experiment shows that only pre-processing, segmentation and feature extraction are not sufficient to detect a skin lesion. Classification of skin cancer lesions is done with PNN classifier to classify a skin lesions are cancerous or normal. The proposed system can be constructively used by physicians and patients to distinguish skin cancer more precisely. This tool can be more helpful in rural remote areas where the specialist in the medical field may not be accessible. Since the tool is developed as user- friendly and robust for images received in any conditions, it can serve the purpose of autonomous diagnostics of Skin Cancer [6].

Skin diseases are occurring almost on all groups of ages among people. The rate of skin disease has increased due to lifestyle and changing environments. These factors may act together or in a sequence of skin disease. There are chronic and incurable diseases, like eczema and psoriasis, and malignant diseases like malignant melanoma. Recent researchers have found the availability of cures for these diseases if they are detected in the early stages. Skin is an extraordinary human structure. It frequently suffered from many known and unknown diseases. Therefore, diagnosis of human skin diseases is the most uncertain and complicated branch of science. It has been observed that most of the cases remain unnoticed because of the lack of better medical infrastructure and facilities. This paper effectively proposed (CNN-SVM MAA) system which combines Convolutional Neural Network with Support Vector Machine classifier to develop a Mobile

Android Application. Thus, to evaluate the performance of the proposed system several experiments are conducted on our dataset. A comparative study of applying different Feature extraction algorithms with different classifiers was accomplished. The results obtained showed the adequacy of the proposed (CNN-SVM - MAA) system of how many skin diseases images have been detected from skin disease dataset. Which lead to detecting skin disease and provide the user with the disease name and treatment related prescription with high accuracy. Identification of disease can help in reducing the problem of skin disease spread and will provide a better way to identify the skin problem. This application has used a modified pre-trained model of Convolutional neural network and SVM Algorithm. This will help in detection of skin disease in rural parts of India where there is already a huge lack of basic medical facilities [7].

The work recommended in this paper is to detect skin diseases using convolution neural networks. Sample images for the diseases like acne, keratosis, Eczema herpeticum, and Urticaria from DermNet dataset are considered. Convolutional layers are the layers where filters are applied to the original image by moving the filter in vertical and horizontal direction.Rectified linear unit layer (ReLU) performs thresholding operation to the entire image. This layer retains the positive values and all the negative values are replaced with zero. The output of ReLU layer is fed to Pooling layer. Average pooling or Maximum Pooling can be performed. The fully connected layer multiples the output from the preceding layer by a kernel matrix with weights and then bias vector added to it. The proposed work aims at categorizing the input image into four classes like acne, keratosis, eczema herpeticum, and urticaria [8].

Because skin disease is one of the most well-known human afflictions, intelligent systems for classification of skin diseases have emerged as a new area of research in deep understanding, which is critical for dermatologists. Due to the complexity of the skin texture and the disease's visible proximity, pinpointing the infection is difficult. Skin photographs are filtered to remove unwanted noise and then processed to improve the image quality. To test 8238 photos, we employed 25,331 clinical skin illness images, training images from diverse lesions of eight categories, and no-skin ailments at various anatomic places. Skin lesions such as Vascular lesion, Melanoma, Basal cell carcinoma, Melanocytic nevus, Actinic keratosis, Benign keratosis Dermatofibroma and Squamous cell carcinoma are the types of skin cancer. Complex approaches, such as Residual Neural Network (ResNet), a form of Deep Learning Neural Network, are used to classify images and generate a diagnosis report with high accuracy as a confidence score. By bypassing the identical layers, ResNet speeds up the training process. Every subsequent layer results in a significant improvement in the training process. The results of this research can aid specialists in making an early diagnosis, determining the kind of infection and initiating treatment if necessary [9].

The most potent protection for vital organs in the human body is the skin. It works as a barrier to protect our inside organs from harm. However, serious infections caused by fungus, viruses, or even dust can harm this crucial portion of the human body. Various skin illnesses affect millions of people across the world. People suffer from a variety of ailments, ranging from acne to eczema. A little boil on the skin can sometimes evolve into a serious problem, or even an infection, causing serious health problems. Some skin conditions are so contagious that they can be passed from one person to another simply by shaking hands or sharing a handkerchief. A correct diagnosis can lead to effective therapy. Here, attempted to create a prototype utilizing neural networks to detect skin disorders in this study. CNN is chosen, which stands for convolutional neural network, as the neural network of choice. DNN, or deep neural network, has been used in previous detection studies. Now it has classes to recognize dermatitis hand, eczema hand, eczema subcute, lichen simplex, stasis dermatitis, and ulcers, which are common skin conditions. This work is a hybrid of image processing algorithms and machine learning. Where image preprocessing has resulted in a picture that CNN is using to organize the classes. The preparation information consists of five types of skin, as mentioned previously. By putting the structure into action on the ground, precision is of 73 percent [10].

From the survey of about 10 papers, following inferences can be drawn.

Citation	Algorithms					
	Support Vector Machine (SVM)	Convolutional/ Neural Network (CNN)	Probabilistic Neural Network (PNN)	K-Nearest Neighbor (KNN)	Residual Neural Network (RESNET)	Deep Neural Network (DNN)
[1]	✗	✗				
[2]						
[3]		✗		✗		
[4]		✗				
[5]						
[6]			✗			
[7]	✗	✗				
[8]		✗				
[9]					✗	
[10]		✗				✗

Table 1 : Summary of Literature review

- In [1], it uses Alexnet, a pretrained CNN model, for feature extraction and gained up to an accuracy of 98%.
- In [2], already available functions from Open CV are used for each step and had an accuracy of 90% approx.
- In [3], it developed a transfer learning model in which feature extraction is done by VGG- 16 layer CNN with KNN. It gained an accuracy of about 99%.
- In [4], it studied different CNN algorithms for face skin disease classification based on clinical images which achieved a mean recall of 77% and mean precision of 70%.
- In [5], it uses GLCM algorithm for feature extraction and PNN for classification which resulted in an accuracy of 95%.
- In [6], this paper deals with image processing techniques like adaptive thresholding, edge detection K-means clustering and morphology-based segmentation have been used for identification of skin diseases with high accuracy.
- In [7], it proposes a CNN-SVM-MAA system combining CNN with SVM classifier to develop a Mobile Application with a high accuracy.
- In [8], this paper uses CNN for the detection of skin diseases. The work was successfully completed with an accuracy of 98-99%.
- In [9], this paper uses Residual Neural Network (ResNet) which is a type of Deep Learning Neural Network which is utilized in classification of the image and obtained the diagnosis report as a confidence score with high accuracy.
- In [10], uses CNN for skin disease detection prototype and had a precision of 73%.

• For skin disease detection and prediction, the Convolutional Neural Network (CNN) is mostly used.

• The accuracy of CNN is around 80-90% depending upon the dataset used.

• Since CNN is computationally efficient, it automatically detects the important features without any human supervision.

III. METHODOLOGY

The methodology of the proposed system for detection, extraction and classification of skin diseases images is described. The system will help significantly in the detection of melanoma, Eczema, Psoriasis, Atopic Dermatitis and Vitiligo. The whole architecture can be divided into several modules consisting of pre-processing, feature extraction, and classification. A neural network is a mathematical model inspired by the transfer process of biological neuron information, and its purpose is to learn a mapping from input to output. By using a loss function as a constraint and backpropagation to optimize the parameters, this method can automatically learn complex tasks for different fields. This method has reduced the need for human labour, such as manual feature extraction.

A CNN is a type of neural network. It generally consists of an input layer, many hidden convolutional layers, and an output layer. Using this structure, the model can include a large number of parameters and obtain some usable properties, such as equivariance, for image-related tasks.

1. *Data Acquisition* –

The most crucial thing to do when dealing with photos and before analysing them is to capture the image or transmit a pre-acquired image to a processing algorithm. Image acquisition is the term for this.

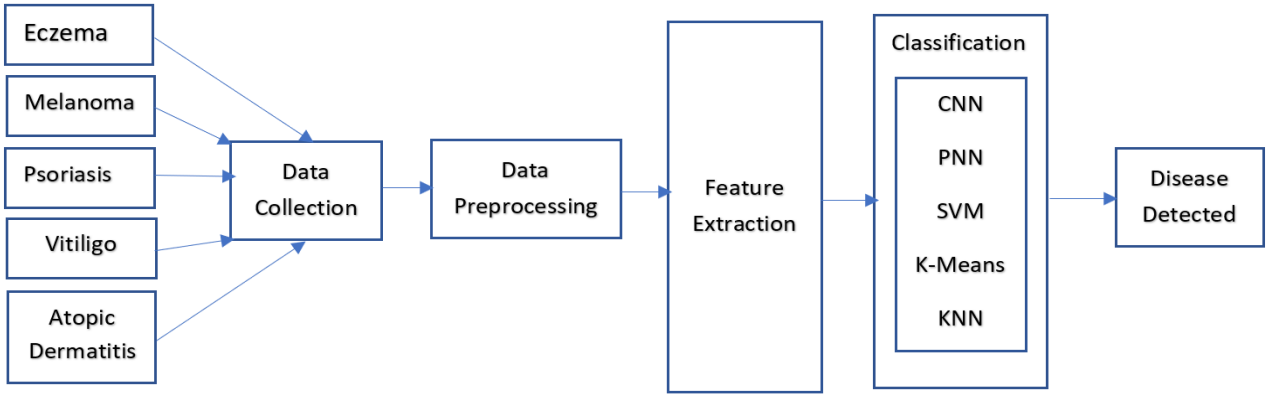
An appropriate camera and/or a pre-captured and image stored sources are used to acquire images. This stage is completed by transferring the dataset image gathered from the mentioned open source to Python Image Processing Programs using a mobile application.

2. *Pre-Processing* –

The pre-processing of an image is the initial stage in the computerized examination of skin lesion images. A nonlinear approach is used in image pre-processing to eliminate noise from lesion images. Filtering by the median is used. It is frequently used and, because it eliminates noise, it is far more effective than conserving edges. It has been shown to be particularly good at filtering salt and pepper noise. The median filter's working structure consists of traversing through the image element by element. Then, for each price, the median of nearby pixels is substituted. The window is the pattern of neighbours that moves over the entire picture element, element by element. The element values from the window are calculated after the initial sorting of all the medians into numerical order.

3. *Feature Extraction* –

Convolutional Neural Network (CNN) is a set



Steps Involved in Skin Disease Detection

of stacked layers that includes both nonlinear and linear processes at its core. These layers are taught in a group setting. Convolutional layer, pooling layer, nonlinear Rectified Linear Units (ReLU) layer coupled to a normal multilayer neural network called fully connected layer, and a loss layer at the backend are the primary building components
of any CNN model. CNN is well-known for its outstanding performance in visual tasks and natural language processing. AlexNet is a deep CNN model with five convolutional layers and a nonlinear ReLU layer stacked after each. In addition, the first, second, layers, Moreover, two normalization layers are stacked after the first and the second convolutional layers. Furthermore, two fully connected layers at the top of the model are preceded by a softmax layer. Proposed system deals with feature extraction from a pretrained convolutional neural network. Because it is the easiest and robust approach to use the power of pre-trained deep learning Networks.

4. Classification –
A computer vision method is classification.

The role of classification is to classify the image using a Support Vector Machine after the features have been extracted (SVM). The algorithm utilized is the support vector machine, which is a statistical analysis algorithm based on statistical theory. This is the best method for categorizing the various diseases. The SVM approach is fed with pre trained data, which aids in disease detection. Training datasets are used to extract features (color feature and texture feature). A SVM can be used to train a classifier using features derived from the training set.

Convolutional Neural Network (CNN) –
A convolutional neural network (CNN) is a form of artificial neural network that is specifically intended to process pixel input and is used in image recognition and processing. CNNs are image processing, artificial intelligence (AI) systems that employ deep learning to do both generative and descriptive tasks, often including machine vision, which includes image and video recognition, as well as recommender systems and natural language processing (NLP). A CNN employs a technology similar to a multilayer perceptron that is and fifth layers contain max pooling optimized for low processing requirements. An input layer, an output layer, and a hidden layer with several convolutional layers, pooling layers, fully connected layers, and normalizing layers make up CNN's layers. The removal of constraints and increase in image processing efficiency results in image processing and natural language processing being limited in a system that is significantly more effective and easier to teach.

Probabilistic Neural Network (PNN) –
A probabilistic neural network (PNN) is a type of feedforward neural network that is commonly used to solve classification and pattern recognition tasks. A Parzen window and a non-Parametric function are used to approximate the parent probability distribution function (PDF) of each class in the PNN method. The class probability of new input data is then estimated using the PDF of each class, and Bayes' rule is used to allocate the class with the highest posterior probability to new input data. The risk of misclassification is reduced with this strategy. The Bayesian network and a statistical procedure known as Kernel Fisher discriminant analysis were used to create this form of ANN.

Support Vector Machine (SVM) –
Support Vector Machine (SVM) is a supervised machine learning technique that can be used to solve classification and regression problems. It is, however, mostly employed to solve categorization difficulties. Each data item is plotted as a point in n-dimensional space (where n is the number of features you have), with the value of each feature being the value of a certain coordinate in the SVM algorithm.

K-Means –
K-Means clustering is a vector quantization method that seeks to split n observations into k clusters, with each observation belonging to the cluster with the nearest mean (cluster centers or cluster centroid), which serves as the cluster's prototype. The unsupervised K-Means clustering algorithm is used to separate the interest area from the background. Based on the K-centroids, it clusters or partitions the given data into K-clusters or sections. When you have unlabelled data, the algorithm is used (i.e., data without defined categories or groups).

K-Nearest Neighbors (KNN) –
K-Nearest Neighbors (k-NN) is a supervised machine learning algorithm i.e., it learns from a labelled training set by taking in the training data X along with its labels

y and learns to map the input X to its desired output y. K-Nearest Neighbors (k-NN) is a supervised machine learning algorithm i.e., it learns from a labelled training set by taking in the training data X along with its labels y and learns to map the input X to its desired output y.

1V. FUTURE SCOPE

For further improvisation Machine Learning can be applied to the system modules. The features would be introduced or upgraded to the system by introducing efficient ML algorithms and integrating it with Image Processing modules would remove constraints to the project. Also, by following the ML approach to our Project Modules the web and app module would suggest dermatologist for further Treatment.

V. 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. Image processing techniques help to build automated screening systems for dermatology at an initial stage. Identification of disease can help in reducing the problem of skin disease spread and will provide a better way to identify the skin problem. This will provide a low-cost way to do medical treatment without any delays.

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