

# To Identify Animal Skin Disease Model Using Image Processing

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## ABSTRACT

This paper proposes a skin disease detection method based on image processing techniques. This method is mobile based and hence very accessible even in remote areas and it is completely noninvasive to patient's skin. The patient provides an image of the infected area of the skin as an input to the prototype. Image processing techniques are performed on this image and the detected disease is displayed at the output. The proposed system is highly beneficial in rural areas where access to dermatologists is limited. Now a day's image processing is most effective for detection of these kinds of skin diseases. It uses different techniques to identify the part affected by disease like feature extraction, filtering, image pre-processing, image segmentation.

**Keywords :** Image Processing, Skin Diseases, Segmentation, K means, SVM, Image Pre- Processing, Filtering

## I. INTRODUCTION

The Animals body have largest organ called skin. It separates the inner parts of body and also form outer environment. The skin is major organ which protect body from the allergy, viruses, infection, bacteria and it also controls the temperature of body. There are many symptoms like swelling, burning, redness and itching which can change or damage the texture of skin. They may be caused by allergies, irritants, genetic problems and immune system problems. All these symptoms can result in different diseases like acne, alopecia, eczema, ringworms causing distortion in look and feel of person concerned. Diseases such as cancer related to Skin can be caused by many distinct reasons [1].

The various techniques of image processing like filtering, feature extraction, segmentation are utilized to detect these skin diseases. The image processing techniques are applied only on digital image so we need to convert image into digital form. This digital image is used to get meaningful information or to get

improved image by performing functions onto image. So we can say that it is the signal processing in which input an image and the output also another image is having same properties of input. Image processing is widely used technology that take input samples as 2-D signals and after that they apply fixed signal processing methods to them.[2].

For dermatologists, there are numerous difficulties to distinguish the infected area in order analyze the skin sickness. The eczema is a fundamental footstep of analysis along the size of lesion's covering is highly valuable in curing record. [3].

The skin diseases have very wide range. It is necessary to identify these diseases on early stages and prevent them from spreading. The parameters that are considered for disease detection must be identified in early stages. The process continues by firstly taking an image, for noise reduction filters are applied on it and after that the various segment of image is utilized to extract the information. This extraction can be done by feature extraction on the

basis of input parameter. When extraction is to be done then classify them using appropriate Classifier to identify diseases[4].

### 1.1 Applications of Techniques

#### Data Mining

To automatically sort medicinal images, data mining methods must be utilized, association rule mining and neural networks. In both cases, the issue comprises of building a classification model utilizing traits extracted from and connected to Melanoma, then evaluating the adequacy of the model using new images. The way toward building the classification model (classifier) incorporates pre-handling and extraction of visual elements from already labeled pictures (i.e. training set).

## II. RESEARCH WORK RELATED TO IMAGE PROCESSING ALGORITHM

### 2.1 Skin Diseases Detection Models for Humans.

Skin diseases are frequent diseases to every person and various types of infections are becoming very frequent. You know that all of these diseases are very harmful, especially if not controlled at an early stage. Skin diseases not only damage the skin. It can have a large effect on a person's daily life, destroy confidence of a person, hang their movement, and turn to depression. Sometimes, many people try to treat these allergies by using their own therapy. However, if these methods are not appropriate for that type of skin disease then it would make it more harmful. Skin diseases can easily transfer from human to human so there is a need to control it their initial stage to prevent it from spreading. This paper presents an implementation of a skin diseases diagnosis system which helps user to detect human skin diseases and provides medical treatments timely. For this purpose, user will have to upload a disease affected skin image to our system and give answers to

the questions which are asked to user according to the symptoms of the skin [5,6,7].

- 1) Image preprocessing, segmentation and Feature extraction.
- 2) Classification model and skin disease predication.
- 3) Medical treatment suggestions or advice.

### 2.2 Detection of Leaf Diseases by Image Processing.

In India, mostly peoples are farmers. They have large dependency on the agriculture. They want good quality products. The very important agricultural products from customer point of view are fruits and vegetables. Product quality depends on soil quality, fertilizers and seeds. One major thing which effects production is diseases. To get more profit, it is important to prevent these diseases (Powdery Mildew, Downy Mildew, Black Rot etc.). For this, it is mandatory to identify and control these harmful diseases at their early stage prior it will hinder the basic functionalities of plant internal processes like Photosynthesis, transpiration, pollination, fertilization [34], germination etc. The main reasons for these diseases are pathogens like fungi, bacteria, viruses, and environmental conditions. Various techniques related to image processing can be used to recognize and classify disease in plants [8].

Algorithm:

- 1) Image capturing i.e. RGB image.
- 2) Convert the RGB image into color space i.e HSV/Lab.
- 3) Segment the image to get useful information.
- 4) Feature extraction.
- 5) Training neural network.

### 2.3 Mobile-based Medical Assistance for Diagnosing Different Types of Skin Diseases Using Case-based Reasoning with Image Processing.

In artificial intelligence (AI), medical field is a recent area for research purpose. This paper implements a mobile based medical assistance which is used for diagnosing skin diseases by the use of CBR and image processing. This model was developed to help users to pre-examine their skin situation whether they have a disease or not. Also to increase the awareness of skin diseases on what it may do to our bodies which will lead to death or infecting other people and have a cure before it gets worse. The proposed system is successfully implemented to detect 6 different skin diseases with an accuracy of 90%. The scale of symptoms, which is used for testing, is 15%, for validation it is 10% and for testing it is 75%. This supervised system identify diseases at the rate of 90% where the unsupervised system detect diseases at the rate of 80%. The detection rate of the sample disease with the other related disease is as follows: Eczema - 88%; Psoriasis - 61%; Acne - 75%; Skin Cancer - 51%; Scabies - 43%; and Seborrhea Dermatitis - 34% [9].

2.4 An automated system for recognizing disease conditions of human skin.

In this model, the condition of the skin disease is identified by evaluating skin disease images by using grey normalized symmetrical simultaneous occurrence stencils (GLCM) method. The proposed system is used in an efficient and economical for the automatic recognition of skin diseases. This system is useful for the skin to reduce the error with medical diagnosis. Another is the first test for patients in rural areas, where the good doctors are missing. The system works with relational databases to the storage of implying the need for textual skin images. This system can also work for same type of images directly over feature vectors [10].

Table 1: Comparison of human skin diseases detection models

### III. PROPOSED APPROACH

The proposed in this paper is a prototype with a database of six common skin diseases, using which a patient can self-diagnose and get some prior knowledge of their skin disease before consulting a dermatologist. This prototype can be used in mobile hospitals in rural areas. These days everybody is connected through mobile phones. Thus, this prototype can be accessed even in the most remote locations in the country. The purpose of developing the "to identify animal skin disease" is too many skin disease can be solve and provide the information for disease. Provide the best home remedies, for normal diseases.

Fig .1 Testing process

As can be seen from Fig.1, the testing process consists of an image provided by the patient which undergoes preprocessing and its feature vectors are generated. Since this is an object query recognition application, the feature vectors of the two processes are compared and are classified by a matching algorithm.

#### 3.1 Algorithm

##### 3.1.1) K means :-

The k-means clustering algorithm is a data mining and machine learning tool used to cluster observations into groups of related observations without any prior knowledge of those relationships. k-means is one of the simplest unsupervised learning algorithms that solve the well known clustering problem. The procedure follows a simple and easy way to classify a given data set through a certain number of clusters (assume k clusters) fixed apriori. The main idea is to define k centers, one for each cluster. These centers should be placed in a cunning

way because of different location causes different result. So, the better choice is to place them as much as possible far away from each other. The next step is to take each point belonging to a given data set and associate it to the nearest center. When no point is pending, the first step is completed and an early group age is done. At this point we need to re-calculate k new centroids as barycenter of the clusters resulting from the previous step.

### 3.1.2) SVM :-

SVM is a supervised machine learning algorithm which can be used for classification or regression problems. It uses a technique called the kernel trick to transform your data and then based on these transformations it finds an optimal boundary between the possible outputs. Support Vector Machines are based on the concept of decision planes that define decision boundaries. A decision plane is one that separates between a set of objects having different class memberships. A schematic example is shown in the illustration below. In this example, the objects belong either to class GREEN or RED.

## IV. EXISTING WORK

A) Expert System for Diagnosis of Skin Diseases. The spread of diseases in human body is common. The disease such as cancer can easily spread through the application of interaction. Such diseases have to be detected at early stage so that treatment is possible. In case disease spread beyond certain level then they cannot be cured. Expert system has been devised which can be used in order to provide method of detection and suggest cure. This system required the user to input the symptoms and then repository is used to compare inputted parameters against inputted parameters. The result is being forecasted to the user. The system also suggest the first aid and nearby health care centers. Techniques like data mining and image processing are used in order to determine the

problems. The graphical user interface is utilized so that user does not have to type lengthy commands in order to operate on the system. In other words easy to use interface is provided in this case [11].

### Research Gaps

- 1) Only few diseases are detected by the use of existing system.
- 2) Smart phones are required in order to use this system. GUI applications are supported by the same.
- 3) Depends upon the distance for recording. The range must be below 5cm.
- 4) Light effects should be absent for effective computation.
- 5) Language dependency is present. In other words only English language is supported.

B) Woods Lamp algorithm is utilized in expert system which is more complex than all the other pattern matching algorithm.

This technique is heavily dependent upon the rule based system. The fuzzy system is supported in order to accomplish the cure based system. The forward chaining method is used in expert system to determine skin disease if any. The children skin diseases can also be detected and cure can be suggested through the application of this system. System also supports online and web based applications to provide timely information to the users so that cure can be suggested and disease can be detected at early stage of the disease. Modular approach is possible. There are two main modules associated with the system. Diagnosis and management tools are merged together to generate optimal performance in child skin diseases detection. The cure is suggested on the basis of answers provided by the user. The symptoms associated with skin diseases are identified. The

skindiseases of children can be identified efficiently[12].

C) An efficient system automation for skin disease identification

Skin cancer is common now days. Detection and prevention of skin cancer at early stage is compulsory. To classify skin lesions computer aided mechanism for demography images is proposed. The segmentation of lesions is compulsory in this case. For this purpose techniques are devised for melanocytic and non- melanocytic skin lesions. For performing segmentation many methods are devised. Out of available techniques K Means is considered to be best one. After segmentation feature extraction is used to create batches similar feature lesions. The features could be color, text and shape. The support vector machine is used as a classifier so that distinct lesions can be categorized [13].

D) Mobile based applications to detect skin diseases within living things.

Techniques are available to detect diseases and provide useful information on the go to the user. Mobile teledermatology is utilized for efficiently providing information to the user about their health disease. Supervised classification is used to create mobile based prototype to analyse skin lesions. Malignant Melanoma is detected through mobile based technique. features of extraction and classification are used to efficiently handle skin lesions [14].

## V. CONCLUSION

This paper gives a description of various skin diseases diagnosis models for plants, humans etc. by using image processing from which researcher can get an idea for an efficient techniques. This paper has comparison made between existing models on the

basis of accuracy, speed and scale, which give a clarity output details. There are future scopes of improvements in present methodologies as no model guarantee hundred percent accuracy and is also limited to few number of skin diseases. In future present methodologies can be expanded for the detection of skin diseases in animals. A common model should be implemented for identification of all types of skin disease.

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