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# SKIN DISEASE DETECTION USING IMAGE PROCESSING

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**ABSTRACT**

*Skin problems include a wide range of symptoms and severity. They might be pleasant or painful, and they can be temporary or permanent. Some are hereditary, while others are caused by circumstances. Some skin conditions are minor, while others can be fatal. While most skin problems are minor, others can indicate a more serious problem. Skin disease, image processing, segmentation, and other topics are covered. Skin disorders in children are fairly common. Many skin problems that affect adults can also affect youngsters. Skin diseases caused by diapers can also affect infants and toddlers. Children are more likely than adults to get skin illnesses because they are exposed to other children and germs more frequently Many childhood skin disorders resolve on their own, however children may inherit long-term skin conditions. Skin illnesses in children are usually treated with topical creams, medicated lotions, or condition-specific drugs. As a result, early detection of skin illness is critical.*

**KEYWORDS:** *skin disease, python, web, etc*

## I. INTRODUCTION

A skin condition can be either temporary or permanent.
Contact dermatitis and keratosis pilaris are just two of the many transient skin illnesses that exist.

Contact Dermatitis:-
One of the most prevalent occupational ailments is contact dermatitis. Contact with chemicals or other irritating items is a common cause of the illness. These compounds can create a reaction in the skin that causes itching, redness, and inflammation. Contact dermatitis is usually not severe, but it can be rather itchy. Treatments include topical creams and avoiding the irritant.

Keratosis pilaris :-
Keratosis pilaris is a minor skin disorder that results in tiny, rough pimples. The upper arms, thighs, and cheeks are the most common locations for these pimples. They're usually red or white in colour and don't itch or pain. Treatment isn't required, however medicated lotions can help your skin look better.

Permanent skin disorders :-
Some chronic skin disorders start at birth, while others arise later in life.

The cause of these illnesses isn't always clear. Many chronic skin conditions have successful treatments that allow for prolonged periods of remission. They're incurable, though, and symptoms might resurface at any time. Rosacea, which causes tiny, red, pus-filled bumps on the face, and psoriasis, which causes scaly, itchy, and dry patches, are examples of chronic skin disorders. Vitiligo is a skin condition that causes huge, uneven patches of skin.

Skin disorders in children :-

Children's skin problems are prevalent. Many of the same skin disorders that affect adults can affect children. Diaper-related skin problems can also affect infants and toddlers. Because children are exposed to other children and germs more frequently than adults, they are more likely to acquire skin diseases. Many childhood skin problems fade with time, but children might potentially inherit long-term skin conditions. Most paediatric skin problems can be treated with topical creams, medicated lotions, or condition-specific medications.
Common childhood skin disorders comprise:

- eczema
- diaper rash
- seborrheic dermatitis
- chickenpox
- rashes from allergic reactions

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- Symptoms of skin disorders

The symptoms of skin disorders are diverse. Skin symptoms that arise as a result of everyday concerns aren't usually the result of a skin disorder and skin problems. Blisters from new shoes or chafing from tight jeans are examples of such symptoms. Skin problems with no clear cause, on the other hand, could signal the presence of a serious skin disorder that requires treatment.

Skin anomalies that are typically symptoms of a skin disorder include:

- raised bumps that are red or white
- a rash, which might be painful or itchy
- scaly or rough skin
- peeling skin
- ulcers
- open sores or lesions
- dry, cracked skin
- discolored patches of skin
- fleshy bumps, warts, or other skin growths
- changes in mole color or size
- a loss of skin pigment
- excessive flushing

Proposed system is a web based application which will detect skin disease according to the training dataset.

## II. LITERATURE SURVEY

**Automatic Detection of Melanoma Skin Cancer using Texture Analysis. [1]**

Published in :- International Journal of Computer Applications, vol. 42, no. 20, pp. 22–26, 2012.

This research describes an automated melanoma diagnosis algorithm that may be used on a set of dermoscopy images. To distinguish between Melanocytic Nevi and Malignant Melanoma, topographies are based on grey level Co-occurrence matrix (GLCM) and Multilayer perceptron classifier (MLP). The first practise, Automatic iteration counter, is faster, but the second, Default iteration counter, is more precise, with a precision of 100 for the training set and 92 for the test set.

**Automating Skin Disease Diagnosis Using Image Classification. [2]**

D. A. Okuboyejo, O. O. Olugbara, and S. A. Odunaike,

Published in :- 850–854 in World Congress on Engineering and Computer Science Proceedings, vol. 2, 2013.

In this research, they will use prototyping technique to create and test a system that will compile historical Pigmented Skin Lesion (PSL) picture results, their interpretation, and relevant observations and assumptions by medical specialists. Skilled medical workers in a remote location can use mobile data gathering equipment (such as cell phones) to generate photos of PSL, which can then be sent into the intended system, which should be able to determine if the photographed PSL is malignant (life threatening) or benign (non-threatening).

**Dermatological disease detection using image processing and machine learning. [4]**

V. B. Kumar, S. S. Kumar, and V. Saboo,

Published in :- In the 2016 Third International Conference on Artificial Intelligence and Pattern Recognition, image processing and machine learning were discussed (AIPR). IEEE, 2016, pp. 1–6.

The goal of this study is to create a case-based system for detecting skin cancer using data gathered from users. Through the question-dialog approach, users are guided to characterise their problem using conversational case-based reasoning. DePicT is a knowledge-based approach that uses picture classification and text information from patient health records to detect and predict diseases.

**Dermatological disease detection using image processing and artificial neural network. [5]**

N. Ahmed, M. A. Rahman, and R. Yasir

The 8th International Conference on Electrical and Computer Engineering published this paper. IEEE, 2014, pp. 687–690.

Skin infections are one of the most common health issues around the world. In this paper, we present a method for detecting several types of dermatological skin disorders using computer vision-based methodologies. The system includes two phases: first, it pre-processes colour skin photos to extract important information, and then it identifies illnesses.

## III. PROPOSED SYSTEM

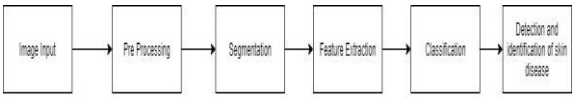


Fig: Skin Disease Prediction

The system will perform different operations, including as pre-processing, segmentation, feature extraction, and classification on the initial input image. Preprocessing removes undesired components, segmentation divides the region of interest into a number of pieces, and the feature extraction phase extracts and stores the data for comparison. Finally, the disease is identified after the classification and comparison phases.

## IV. MATHEMATICAL MODEL

Let S stand for Closed System. Ip, Op, Ss, Su, Fi, A = S To obtain Su state by selecting input from the system and performing various actions from the set of activities A.

S=Ip,Op,Ss,Su,Fi,A Where, IP1=Username, Password, and a picture a collection of actions= A=F1,F2,F3,F4 Where

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F1 = random sample selection from a given dataset F2= create a set for each sample F3= Retrieve a set's prediction result. F4= vote for each expected outcome. S=A group of users, Ss = state of rest, registration, and login The state of success is successful analysis. Failure state (Fi)

Objects:
1) Input1: Ip1 = Username, Password 2)Input2 : Ip2=image
1)Output1 :Op1 = set
2)Output2 : Op2 = Voting
3)Output3 : Op3= Most voted prediction result as the final prediction result.

## V. ALGORITHM

The Algorithm is used in our project is written down below.

**Canny Edge Detection :**

John F. Canny first invented the Canny edge detector in 1986. It was one of the default edge detectors in image processing, and it's still frequently used today.

There are five steps to the Canny edge detection algorithm.

To remove high frequency noise,

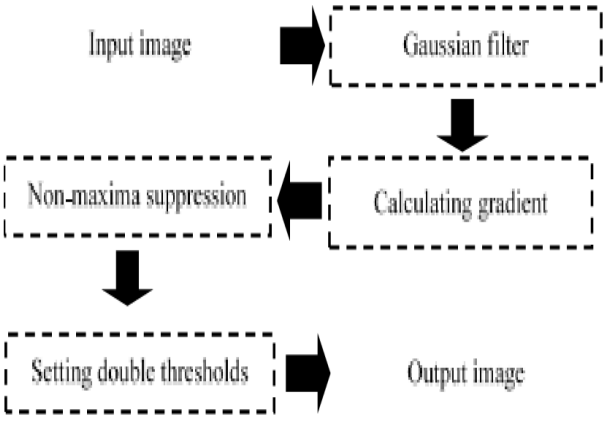
Step 1: use a Gaussian filter to smooth the image.

Step 2: Calculate the image's gradient intensity representations.

Step 3: Apply non-maximum suppression to edge detection to eliminate "false" replies.

Step 4: Apply thresholding to the gradient values by setting a lower and upper boundary.

Step 5: Use hysteresis to track edges by suppressing weak edges not related to strong edges.

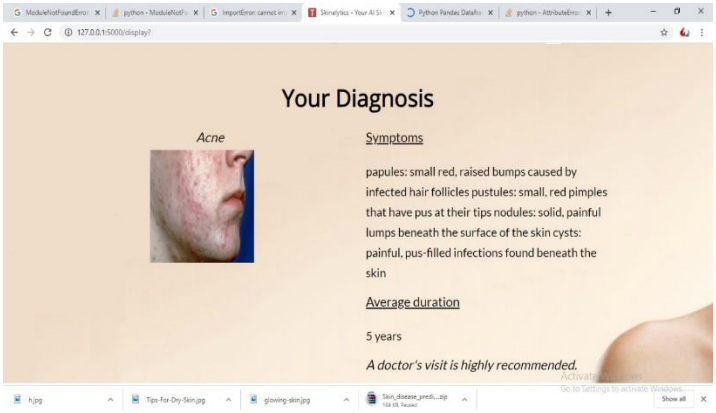



## VI. RESULTS

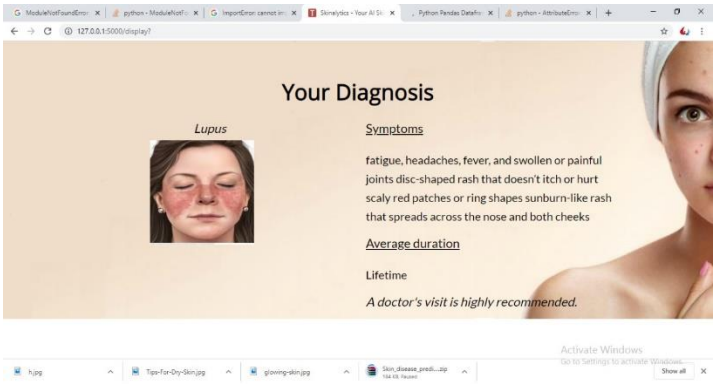
Under the categorization button, the output, which is the recognised skin illness, is displayed in the GUI (Graphical User Interface).

The result is displayed as psoriasis and acne in the illustration.

The exhibits the GUI that displays the Acne disease that has been identified.




The following fig. shows the GUI that displays the identified disease as Lupus.




The following table shows the rate of accuracy with which the proposed method detects skin disorders.

| Skin Disease | Input Images | Detected Images | Accuracy |
|---|---|---|---|
| Acne | 26 | 23 | 83% |
| Psoriasis | 23 | 21 | 92% |
| Melanoma | 27 | 24 | 89% |
| Rosacea | 24 | 20 | 84% |

Table: Accuracy Rate for Different Diseases

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## VII. CONCLUSION

As a result, we created a python-based prototype software application for skin disease prediction utilising image processing.. We performed operations such as:

1. Pre processing
2. Segmentation
3. Feature Extraction
4. And disease prediction

Because this is a prototype model, the accuracy will be lacking, therefore it will require some changes and commercial tools to construct a large-scale application, which may be done once the project is completed.

## VIII. FUTURE SCOPE

Five disorders are included in the suggested prototype. The prototype must feature a database that includes most skin disorders as well as images of all skin tones and types in order to be commercially viable. This would result in effective and precise detection.

The prototype is currently an offline application. This prototype could be improved by connecting it to the internet and providing dermatologists with quick online access after initial detection. This reduces the time it takes for the patient to reach the dermatologist. It can be improved even more by offering precautions and immediate relief techniques that the patient can use to avoid aggravating the disease.

The proposed prototype can be tweaked to detect the stages of basal and squamous skin cancer.

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