

SKIN DISEASES PREDICTION USING IMAGE ANALYSIS

N SELVANATHAN*¹, MUSKAN SARAF*², NIVEDITHA DANEESH*³, PADMA PRIYA R*⁴,

SIVARAMAN R*⁵

¹Assistant professor, Department of Information Technology, Sona College of Technology, Salem, Tamil Nadu, India

^{2,3,4,5}Student, Department of Information Technology, Sona College of Technology, Salem, Tamil Nadu, India

Abstract- Skin diseases have a big impact on people's life and health. Current research proposes an efficient approach to identify singular kind of skin diseases. It is important to create programmed strategies so on broaden the precision of conclusion for multitype skin infections[7]. In this five sort skin illnesses like hives, cold sores, dermatitis, melanoma, and psoriasis sickness of the skin could be distinguished by a supplanting acknowledgment technique with convolutional neural network[7]. Skin illnesses could even be brought about by mycosis, microbes, hypersensitivity, or infections, and so forth.[11] The advancement of lasers and Photonics based medical technology has helped a lot to diagnose the skin diseases far more quickly and accurately. But the price of such diagnosis remains limited and really expensive. In this way, picture handling strategies help to frame robotized evaluating framework for dermatology at an underlying stage. Computer vision features a task within the detection of skin diseases during a sort of techniques. This work contributes within the research of disease of the skin disease detection. Here we have illustrated an image processing method to identify skin disease. In this method the digital image of the disease affected skin area is pictured and using image analysis type of the disease is identified[7][11]. Our methodology is basic, quick and modest as it doesn't need costly gadgets other than a camera and a PC or a cell phone.

(Keywords: convolutional neural network, skin disease detection, image processing, computer vision, framework, artificial intelligence)

1. INTRODUCTION

Most of the skin diseases appear different on different skin tone. In most of the cases dermatologists are available in rural areas. In urban areas, people stall to consult medical help. Thus, picture handling methods help to make computerized evaluating framework for dermatology at an underlying stage.[11] Drawing out the features plays a key role in helping to classify skin diseases. So, to beat this problem, our project provides an approach to use various PC vision-based methods like profound figuring out how to chase out the example of skin problems and consequently foresee the various sort of skin infections[7]. Dermatological issues are the most preeminent far-reaching infections inside the planet. Skin diseases can place a crucial emotional and psychological burden on patients which can be far worse than the physical impact. The dermatology stays the

preeminent questionable and convoluted part of science due to its complicity inside the methods associated with determination of illnesses identified with hair, skin, nails.[13]

2. LITERATURE SURVEY

i) Title: - Automatic Detection of Melanoma Skin Cancer using Texture Analysis.

Author: -Amr Sharawy Cairo University, Mai S.Mabrouk MUST University, Mariam A.Sheha Cairo University.

Definition: - This paper presents a robotized technique for melanoma conclusion viable on a bunch of dermoscopy pictures. Geologies quarried depend on dim level Co-event network (GLCM) and Using Multilayer perceptron classifier (MLP) to arrange among Melanocytic Nevi and Malignant melanoma. The main practice, Automatic emphasis counter is quicker however the subsequent one, Default cycle counter gives a superior exactness, which is 100 % for the preparation set and 92 % for the test set.[8]

ii) Title: -Dermatological disease detection using image processing and artificial neural network.[7]

Author: -Md Ashiqur Rehman, Nova Ahmed, Rahat Yasir.

Definition: - Skin sicknesses are among the most widely recognized medical conditions around the world. In this article we future a technique that utilizes PC vision-based strategies to recognize different sorts of dermatological skin ailments. The framework chips away at two stages first pre-measure the shading skin pictures to separate critical highlights and later distinguishes the sicknesses.[6][7]

iii) Title: - Dermatological disease detection using image processing and machine learning.[7]

Author: -S. Selvin Prem Kumar, Varun Saboo, Vinayshekhar Bannihatti Kumar

Definition: - In this exploration paper, we give a way to deal with distinguish different sorts of these infections. We utilize a double stage approach which adequately consolidates Computer Vision and Machine Learning on clinically

assessed histopathological characteristics to precisely recognize the sickness.[6]

iv)Title: - Automating Skin Disease Diagnosis Using Image Classification.

Author: -Solomon A. Odunaike, Damilola A. Okuboyejo , and Oludayo O. Olugbara

Definition: -In this paper they study would zero in on planning and inspect framework that will order past Pigmented Skin Lesion (PSL) picture results, their investigation, relating perceptions and suspicions by clinical specialists utilizing prototyping system. Talented clinical staff in a far-off area can utilize portable information acquiring gadgets, (for example, cell) to produce pictures of PSL, supply such pictures as contribution to the arranged framework, which in turns ought to insightfully have the option to indicate the danger (hazardous) or favorable (non-undermining) status of the imaged PSL.[6]

V)Title: - Dermatological Disease Detection using Image Processing and Neural Networks[7]

Author: -Harsh Kumar, Sourav Patra , Mrs. S.Kalaiarasi.

Definition: -In this paper the proposed framework manages the formation of an application that helps in finding of Skin infection. It utilizes picture preparing and AI innovation to recognize infections. disease.[7]

3. EXISTING SYSTEM

The existing system mostly depends upon doctor. And this is a very slow process. Many people does not get proper treatment for their skin problem. Some skin problem look simple but in future they were cause you serious damage. In country zone clinics don't have skin expert specialist. Furthermore, treatment additionally exorbitant for destitute individuals. In some cases skin sickness isn't as expected recognized by the specialists.[6]These are the issue of existing framework. Feed forward back propagation artificial neural network is used in most of the existing systems, where the nonlinear data may not be evenly distributed. The data gets transformed by the Hidden layer (middle layer) of the multilayer network and learns the data transformation to make it linearly separable. This is an approach which gives comparatively less accurate results.

A)Feed Forward Neural Network (FFNN).[14]The FFNN systems make use of single perception, multiple perception or Hidden layer network. The inputs are fed in such a way that no cycle is formed. hence only the forward nodes make use of the given input and thus, reuse cannot be possible in this case leading to lesser accuracy. In single perception FFNN, the sources of info are taken care of straightforwardly to the yield hub utilizing not many loads. Different organizations utilized are covered up layer and so forth,[12]

B) Hidden Layer Neural Network (HLNN). The hidden layer neural network uses concept of abstraction. In these networks the input is fed to output nodes as a result of a function. The estimation of output is based on the provided input. This outcomes in a somewhat more exact outcome, anyway as the info is utilized just a single time, the chance of cycle being framed is restricted, accordingly accomplishing high exactness is unthinkable. Thus a substitute arrangement is framed which is utilizing convolutional neural organizations which will build the exactness and execution of the framework to a bigger degree.[7]

4. PROPOSED SYSTEM

Utilizations convolutional neural organization which is more precise and informational indexes are quicker to prepare. Convolutional neural organization could likewise be a kind of neural organization which has a few or all convolutional layers, it performs better as far as monster scope information and continuous utilization.[12]

The contribution of our approach is as follows:

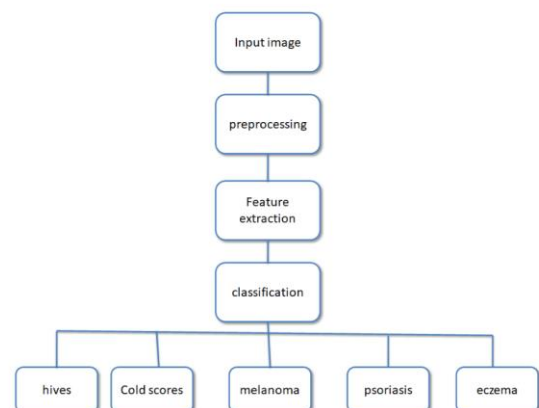
1. A sickness of the skin discovery approach is proposed, which depends on convolution neural organization utilizing Gradient Descent Algorithm. Other than some versatile applications are proposed, for instance, we investigate how the framework is recognizing the infections upheld profound learning.[8]

2. Datasets and KERAS are used Features of Proposed System

- supported the appliance the user can easily and clearly understand about the disease
- User will consult a doctor after knowing about the disease

The convolutional models are prototyped and build using KERAS. The python web framework called flask is used to interact with the fireside base and host web API.

4.1 BLOCK DIAGRAM



The first step is collecting all the input images. Once the image is inputted preprocessing of the image is done which is cross check with the datasets which is already used for training and testing. After preprocessing feature extraction of the image is made. Then it is classified to one of those five diseases that is hives, cold scores, melanoma, psoriasis and eczema. This is the block diagram of the whole process.

4.2 SOFTWARE DESIGN

The webpage has a designed homepage and two buttons one to upload the image and the other is to get the results. It also has buttons in the home page to check what are the symptoms of hives, cold scores, melanoma, psoriasis and eczema. Then using the upload image we can upload the image from the computer to the browser.

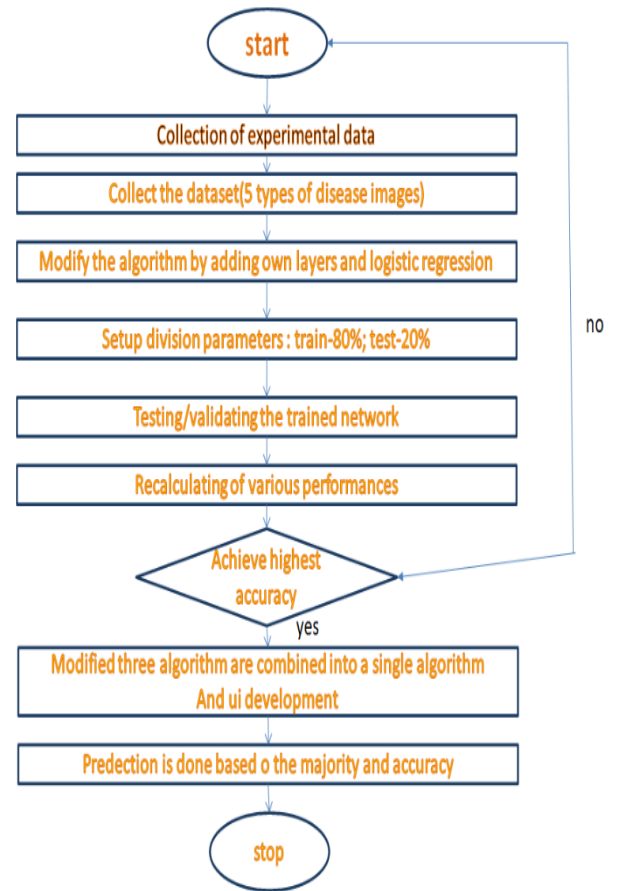
Click on the button to view results and then the webpage will predict the results of the image given as the input.

This is the design of the user interface of our project.



5. FLOW CHART

Start the process with the collection of all the input images which are the five types of disease images hives, cold scores, melanoma, psoriasis, eczema. The next step is preprocessing the collected images and setting up division parameters which is 80 % for training images and 20% for testing images. Next step is modifying the algorithm by adding layers to increase the accuracy. validate the algorithm and recalculate the various performance. If required accuracy is obtained then proceed or repeat the steps. Once required accuracy is achieved then save the algorithm as a h5 file and then save it into the folder where u have saved the template (html) and static (css, java script) And then once u run the file output is achieved and stop the process.



6. ADVANTAGES AND DISADVANTAGES

6.1 ADVANTAGES

- CNN usually take seconds to minutes to diagnosis when confronted with a picture of a skin lesion. The inputs, algorithms, and outputs can be accessible to anyone with access to the web. This takes brief timeframe than the stand by and go time given to a dermatologist arrangement.[9]
- The calculations are regularly versatile and that they can gain from adding new pictures over the long haul.[9]
- CNN is prepared to proceed as a confirmed dermatologists, and their precision will in any case improve in future.
- CNN can predict lesions so quickly with lesser cost than given to a dermatologist[9].

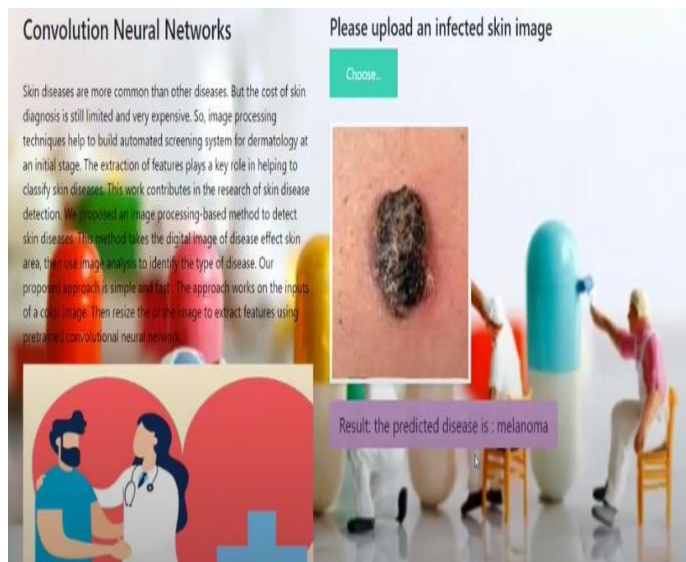
6.2 DISADVANTAGES

- CNN and any instruments offering indicative help will had the opportunity to be formally affirmed as clinical gadgets, at that point re-endorsed as their calculations extend[9].

● CNN will probably be completely internet, utilizing cloud-based capacity, and can had the chance to have amazing network protection frameworks to ensure reinforcement simply in the event of information base or worker disappointment, and validation cycles to stop unapproved access[9].

7. RESULT

At the point when it includes deep learning and its application for determination, there are two primary methodologies. The primary methodology is characterization that has diminishing possible results (finding) by planning information to explicit results. The subsequent methodology is physiological information which consolidates clinical pictures and information from different sources which will not recognize and analyze tumors, or different sicknesses.[10]



8. APPLICATION

Skin disease prediction:

Acute prediction of diseases available first on hand to every citizen who uses this application, disease analysis possible right from home, sparing the need to visit hospitals, nursing homes or health centers. Disease identification is easier using this. One can predict it without much effort. Thus, it can be utilized in little clinical facilities in rustic territories.[7]

9. CONCLUSION

In this field of use, the examination on skin infection pictures dataset is utilized to distinguish five common skin sicknesses with a most extreme exactness level of 75% [8]. A number of irrelevant attributes are reduced through image resizing, image rotation, are done in image pre-processing. A CNN model is trained and tested until it gives a good accuracy. Then model is saved and a UI is built using flask and HTML.

In this manner, it'll be the primary objective of following stage to recognize contrasting types of skin infections.[7]

10. FUTURE SCOPE

Here we made a couple of example disease and few example images during a datasets to spot. In future many skin diseases and not only disease supported skin every sort of disease and wound are often implemented within the system for future enhancement. This process is often extended to form this model a typical procedure for preliminary disease of the skin diagnosis method because it will reduce the treatment and diagnosis time.

11. REFERENCES

- [1] M. A. Sheha, M. S. Mabrouk, and A. Sharawy, "Automatic detection of melanoma skin cancer using texture analysis," *International Journal of Computer Applications*, vol. 42, no. 20, pp. 22–26, 2012
- [2] R. Yasir, M. A. Rahman, and N. Ahmed, "Dermatological disease detection using image processing and artificial neural network," in *8th International Conference on Electrical and Computer Engineering: Advancing Technology for a Better Tomorrow, ICECE. Pan Pacific Sonarga on Dhaka, 2014*, pp. 687–690.
- [3] Vinayshekhar Bannihatti Kumar, S. Selvin Prem Kumar, Varun Saboo "Dermatological disease detection using image processing and machine learning".
- [4] Okuboyejo, Damilola A, et al. —Automating "Skin Disease Diagnosis Using Image Classification". *Proceedings of WCECS 2013, October 23 - 25, 2013, San Francisco, USA, IAENG Open Access Publication, 24 Oct. 2013, www.iaeng.org/publication/WCECS2013/.*
- [5] Mrs. S.Kalaiarasi¹, Harsh Kumar², Sourav Patra³ "Dermatological Disease Detection using Image Processing and Neural Networks".
- [6] <https://www.irjet.net/archives/V7/i6/IRJET-V7I6120.pdf>
- [7] https://www.researchgate.net/publication/334123580_Melanoma_Skin_Cancer_Detection_using_Image_Processing_and_Machine_Learning
- [8] https://www.researchgate.net/publication/258651204_Automatic_Detection_of_Melanoma_Skin_Cancer_using_Texture_Analysis
- [9] <https://www.dermnetnz.org/topics/convolutional-neural-networks-in-dermatology/>
- [10] <https://www.mdpi.com/2414-4088/2/3/47/htm>
- [11] <https://github.com/evilreborn/skin-disease-analysis>

[12]https://en.wikipedia.org/wiki/Feedforward_neural_network

[13]<https://pediatriccriticalcare.conferenceseries.com/>

[14]https://www.researchgate.net/publication/345319754_Ecological-environmental_quality_estimation_using_remote_sensing_and_combined_artificial_intelligence_techniques