Detection of Skin Disease by using Image Processing

Divya Borse[1], Reshma Gambhire[2], Poonam Gambhire[3], Disha Patil[4], Prof. Miss.Poonam Dholi[5]
Department of Computer Engineering
Matoshri College of Engineering and Research Center, Eklahare, Nashik, India

Abstract*: There are many types and forms of skin diseases and have many causes, including internal ones related to hormones and body glands such as acne, or external related to air pollution or sensitivity to sunlight such as rashes. The skin disease may be contagious, such as scabies and lice, or it may not be contagious, such as drug allergy and rosacea, or it may be chronic, such as psoriasis and atopic eczema, or it may be rare, such as sweet syndrome and ofuji disease. The outlook of society, in general, reduces the importance of skin disease when it appears and it is preferable not to visit the doctor. Skin diseases are a major and worrying problem in societies due to their physical and psychological effects on patients. Detecting skin diseases at an early stage has an important role in treatment. The process of diagnosing and treating skin injury is related to the skill and experience of the specialist doctor. skin disease prediction by using a neural network based on image analysis. Diagnosis and prediction of skin disease take a very long process because it requires a patient's history, physical examination, and proper laboratory diagnostic tests. st of such diagnosis is still limited and very expensive. So, 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 disease. proach works on the inputs of a color image. Then resize the of the image to extract features using pre trained convolutional neural network. After that classified feature using Multiclass SVM. Finally, the results are shown to the user, including the type.*

Keywords: Skin Disease, Neural network, Image processing, Feature Extraction, CNN, Machine Learning, Soft-max Classifier, Dermatology

I. INTRODUCTION

The biggest organ of human is a skin, which mass it is approximately around 4 kg to 5 kg. The skin has a surface area of about 1.2 m2 – 2.2 m2. It has many functions andespecially it is one of the most essential organs for human beings. The uses and the function of the skin are protecting the body, maintaining the temperature and sense as well.The skin is separated into three different layers which are epidermis, dermis, and subcutaneous. The human skin is made up of two layers which are known as the epidermis.Where, the dermis is the thick layer of living tissues below the epidermis that forms the true skin and contains a lot of important structures such as blood capillaries, sweat glands,hair follicles, and other structures. Dermatological diseasesare most prevalent diseases worldwide. The diagnosis of dermatological diseases requires extensive experience. In the current scenario, about 90 percent of diseases of the skin are managed exclusively by Primary Care. This implicatively depicts that most skin diseases can be solved if care is taken at an early stage. Skin diseases can affect the quality of life of patients and it efficiently requires early diagnosis. Therehave been many endeavors to implement traditional medicine across the different parts of the globe especially in countries that are not technologically advanced, but the efforts have been met with challenges such as the huge cost. The skin disease may be contagious, such as scabies and lice, or it may not be contagious, such as drug allergy and rosacea, or it may be chronic, such as psoriasis and atopic eczema, or it may be rare, such as sweet syndrome and ofuji disease.

II. PURPOSE

Early detection and accurate diagnosis of skin diseases are crucial for effective treatment and prevention of complications. However, there are several challenges associated with identifying and diagnosing skin diseases,

including limited access to dermatologists, delayed appointments, and the shortage of expert dermatological care in certain regions.

Key objectives and purposes of a farmer chatbot include:
- To develop an effective and efficient model which detects and predicts skin disease based on the user input. To achieve good accuracy.
- To develop a User Interface (UI) that is user-friendly and takes input from the user and predicts the skin disease. Distinguish the spam and non-spam reviews.

III. OBJECTIVE OF SYSTEM

- Individual consumers
- Mobile Apps for Self-Assessment
- Dermatology Clinics
- Community Health Centers

IV. OBJECTIVE OF SYSTEM

Skin diseases are a widespread health concern affecting millions of people worldwide. These conditions can range from mild irritations to severe, potentially life-threatening illnesses. Early detection and accurate diagnosis of skin diseases are crucial for effective treatment and prevention of complications

SYSTEM ARCHITECTURE
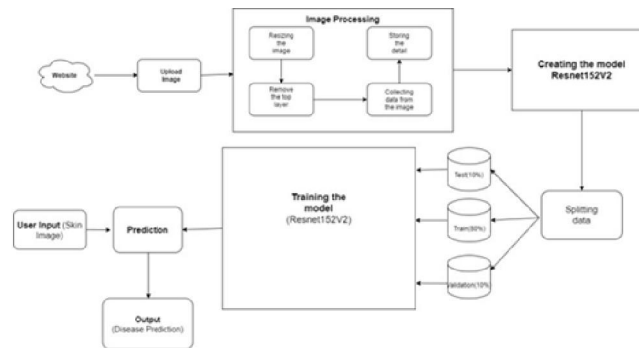
Detecting skin diseases can be a challenging task and should be performed by a medical professional. However, I can provide some general information on how skin diseases are diagnosed and some common symptoms associated with them.

Skin diseases are typically diagnosed through a combination of the following methods:
- **Clinical Examination:** A healthcare provider, typically a dermatologist, will visually inspect the affected area of the skin. They will look for physical signs such as rashes, lesions, discoloration, or any other abnormalities.
- **Medical History:** Your doctor will ask you about your medical history, including any previous skin conditions, allergies, family history, recent exposures, and lifestyle factors that may be relevant.
- **Biopsy:** In some cases, a small sample of the affected skin may be taken for examination under a microscope to determine the exact nature of the disease.
- **Blood Tests:** Blood tests can be helpful in diagnosing certain skin conditions, such as autoimmune diseases like lupus.
- **Allergy Testing:** Allergy tests can help identify if an allergic reaction is causing skin problems.
- **Imaging:** In some cases, imaging studies like ultrasound or MRI may be used to examine deeper skin layers or tissues.

- **Early Detection:** Detect skin diseases at their earliest stages to facilitate more effective treatment and better outcomes for patients.
- **Accuracy:** Ensure a high level of accuracy in diagnosing skin conditions to minimize misdiagnoses and unnecessary treatments.
- **Differentiation:** Differentiate between various skin diseases, as there are numerous skin disorders with distinct symptoms and treatments.
- **Non-Invasiveness:** Develop non-invasive or minimally invasive methods for skin disease detection to minimize patient discomfort and risks.
- **Automation:** Implement automated or AI-assisted tools for skin disease detection to increase efficiency and reduce the burden on healthcare professionals.
- **Accessibility:** Make skin disease detection tools and technologies accessible to a broad range of healthcare providers, including those in remote or underserved areas.
- **Education:** Educate healthcare professionals and the public about the signs, symptoms, and risk factors of different skin diseases to promote early detection and prevention.
- **Data Integration:** Integrate patient data, medical history, and diagnostic information to provide a comprehensive view of an individual's skin health.
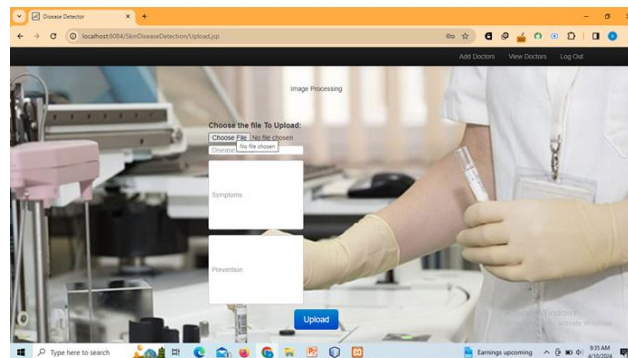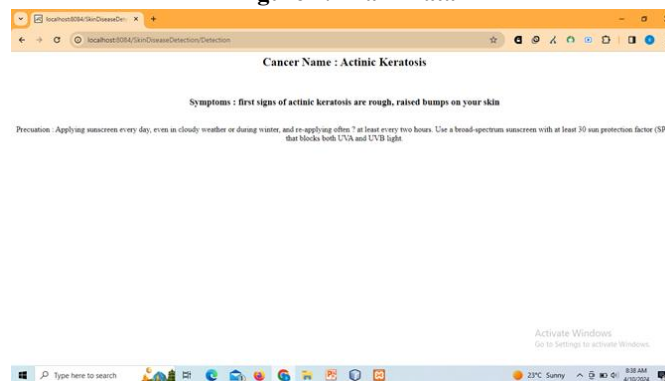
V. RESULT

Figure 1. Train Data

Figure 2. Detection Data

VI. CONCLUSION

This method we can use as an effective, low-cost solution for skin disease detection by a computer-aided system is proposed to resolve difficulties that are created from challenges faced by the dermatologist to recognize the different skin diseases easily. Firstly applied enhancements to remove the noise, two noise reduction technologies were

investigated. Gaussian filter and median filter were compared in the noise reduction and compared four color spaces (RGB, YUV, HSV, and YCbCr) for skin lesion extraction and feature extraction and to improve the computation efficiency. This model is a built-in mobile application with user-friendly interfaces and clear steps.

VII. ACKNOWLEDGMENT

REFERENCES

[1] Z. Ma and J. M. R. S. Tavares," A Novel Approach to Segment Skin Lesions in Dermoscopic Images Based on a Deformable Model," IEEE Journal of Biomedical and Health Informatics , vol. 20, no. 2, pp. 615-623, March 2016.

[2] Sudha J, Aramudhan M and Kannan S, "Development of a mathematical model for skin disease prediction using response surface methodology," Biomedical Research 2017; Special Issue: S355-S359.

[3] Igor Kononenko," Machine learning for medical diagnosis: history, state of the art and perspective,"Artificial Intelligence in Medicine , v.23 n.1, p.89-109, August 2001.

[4] V. B. Kumar, S. S. Kumar, and V. Saboo, "Dermatological disease detection using image processing and machine learning," 2016 Third International Conference on Artificial Intelligence and Pattern Recognition (AIPR) Lodz, 2016 , pp.1-6.

[5] Damilola A. Okuboyejo, Oludayo O. Olugbara, and Solomon A. Odunaike, "Automating Skin Disease Diagnosis Using Image Classification," Proceedings of the World Congress on Engineering and Computer Science 2013 Vol II WCECS 2013 , 23-25 October 2013, San Francisco, USA .

[6] "Expert System for Diagnosis of Skin Diseases", International Journal of Science and Technology, vol. 4, no. 1, 2015.

[7] K. Gimpel and N. Smith, "Softmax-Margin CRFs: Training Log-Linear Models with Cost Functions".

[8] R. Parikh and D. Shah, "A Survey on Computer Vision Based Diagnosis for Skin Lesion Detection", International Journal of Engineering Science and Innovative Technology, vol. 2, no. 2, 2013.

[9] N. Fujishima and K. Hoshino, "Fingernail Detection Method from Hand Images including Palm", IAPR International Conference on Machine Vision Applications, 2013.WCECS 2013 , 23-25 October 2013, San Francisco, USA .

[10] R. Bhardwaj and S. Vatta, "Implementation of ID3 Algorithm", International Journal of Advanced Research in Computer Scienceand Software Engineering, vol. 3, no. 6, pp. 845-851, 2013..