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A DEEP LEARNING APPROACH FOR THE AUTOMATED PROGNOSIS OF SKIN DISEASES

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ABSTRACT

People may now more easily obtain current information thanks to the growth of mobile applications. Users are looking for solutions to problems in the virtual world, especially medical issues. More people have skin conditions than other illnesses. Skin conditions can be brought on by viruses, germs, allergies, fungal infections, and more. A skin condition can alter the skin's tone or texture. Skin conditions are typically persistent, contagious, and occasionally carcinogenic. This research discusses the image-based skin disease diagnosis application for mobile devices. The collection of photos of unhealthy skin is used by the algorithm to examine the ailment. This technique is intended to identify skin conditions from unwholesome photos. By comparing pre processed photos, the threshold value difference is found. The differential in the given threshold will be used in decision making when suspicious unpleasant skin is detected. The app was created using the Android Platform and the OpenCV library to implement the Machine learning algorithm. Android-based mobile applications that can diagnose skin infections have indeed been extensively developed.

The aim is to introduce a deep learning approach for the automated prognosis of skin diseases, leveraging image analysis techniques. The methodology integrates diverse deep learning strategies to enhance the accuracy and efficiency of skin disease prognosis. By combining various neural network architectures, including Densenet and VGG achieves a comprehensive analysis of medical images. The incorporation of advanced image analysis techniques aims to provide a robust and reliable prognosis system. The effectiveness of the proposed deep learning approach is evaluated through rigorous experimentation, demonstrating its potential as an innovative solution for automated skin disease prognosis based on image data.
Keywords—Skin conditions, Machine learning Algorithm, Android Studio, OpenCV library.

INTRODUCTION

Skin is one of the most important and quickest-developing tissues of the human body. The burden of skin disease is regarded as a multidimensional concept that comprehends the psychological, social, and economic significance of the skin disease at the sufferers and their households and in society. It is a contamination that takes place in humans of all ages. Skin is regularly broken due to the fact it's far a touchy part of the body. There are more than 3000 skin diseases. A cosmetically look spoiler disease will have a big effect and might cause extensive aches and everlasting injury. Most of the chronic skin conditions, along with atopic eczema, psoriasis, vitiligo, and leg ulcers, aren't right now deadly, they may be diagnosed as an extensive problem in fitness popularity which includes physical, emotional, and economic outcomes. On the other hand, skin cancers are potentially lethal and their trouble is associated with the temporality that they carry.

One of the most frequent ailments among people all over the world is skin disease. Basal cell carcinoma (BCC), melanoma, intraepithelial carcinoma, and squamous cell carcinoma are examples of skin cancers (SCC). The occurrence of skin cancer is currently greater than the occurrence of other new kinds of lung and breast cancer. Several skin illnesses have symptoms that can take a long time to treat since they can grow for months before being recognized. As a result, computer-based disease diagnosis comes into play since it can produce a result in a short period of time

with more accuracy than human analysis utilizing laboratory procedures. Deep Learning is the most widely used technology for skin disease prediction. Deep learning models will use inferred data to identify and explore features in unexposed data patterns, resulting in significant efficiency even with low computational models. This study presents a robust mechanism for accurately identifying skin diseases using supervisory approaches that reduce diagnostic costs. This has prompted the researchers to consider using a deep learning model to categorize the skin disease based on the image of the affected region.

The increased pollution levels are leading to an increase in the number of people suffering from skin diseases. More than 125 million people suffering from Psoriasis and skin cancer rate has been rapidly increasing over the last few decades especially Melanoma is the most diversifying skin cancer. If skin diseases are not treated at an earlier stage, then it may lead to complications in the body including the spreading of the infection from one individual to the other. Skin diseases can be prevented by investigating the infected region at an early stage. The characteristics of the skin images are diversified so it is a challenging job to devise an efficient and robust algorithm for automatic detection of the skin disease and its severity. To overcome the above problem we are building a model that is used for the prevention and early detection of Acne, Melanoma, psoriasis, Rosacea, and vitiligo. An application is built where a person can upload an image from UI, the image will be sent to the trained model. The model analyses the image and detects the skin disease that the person has. Our system will use a Convolution neural network to train the images of skin diseases.

Hardware Requirements

Server Infrastructure: High-performance server(s) equipped with multi-core CPUs (e.g., Intel Xeon or AMD Ryzen Threadripper) to handle computational tasks efficiently.
Storage :

Sufficient RAM (Random Access Memory) capacity to accommodate the dataset in memory and support model training and inference processes. Recommended: 32GB or higher.
Peripheral Devices:

High-resolution monitors for visualization of data, model training progress, and diagnostic results.
Input devices such as keyboards, mice, and graphics tablets for user interaction with the system.
Printers and scanners for document management and integration with existing healthcare workflows.
Desktop/Laptop:

Standard configuration with modern web browser support.

CONCLUSION

Automated Prognosis of Skin diseases approach for the automated prognosis of skin diseases, leveraging image analysis techniques and utilizing a DenseNet model, holds significant promise for revolutionizing dermatological diagnostics. By integrating diverse deep learning strategies and advanced image analysis techniques, this system aims to enhance the accuracy and efficiency of skin disease prognosis, ultimately improving patient outcomes and healthcare delivery.Through rigorous experimentation and evaluation, the effectiveness of the proposed system has been demonstrated, showcasing its potential as an innovative solution for automated skin disease prognosis based on image data. The system's ability to accurately predict the type of skin disease from uploaded images provides valuable support to healthcare professionals, enabling timely interventions and personalized treatment plans.

Overall, the introduction of this deep learning approach for automated prognosis of skin diseases represents a significant advancement in dermatological diagnostics, offering a reliable and efficient solution for early detection and management of various skin conditions. As technology continues to evolve and datasets expand, the potential for further refinement and enhancement of this system remains promising, ultimately benefiting patients, clinicians, and healthcare systems worldwide.

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