



# Skin Disease Prediction and Health Resource App (DermAI)

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**Abstract**— *The Skin Disease Prediction and Health Resource App is a state-of-the-art mobile application designed to assist users in identifying and managing various skin conditions. This innovative app utilizes advanced algorithms and machine learning techniques to predict the likelihood of skin diseases based on user input, symptoms, and images. Through an intuitive and user-friendly interface, users can input their symptoms, upload images of affected areas, and receive instant predictions and recommendations for further action. Furthermore, the app has unique features including map integration and a shop feature for locating healthcare facilities and comparing medicine prices.*

**Keywords**— *Skin disease prediction, Health resource app, input, images, users, skin, app, symptoms, upload*

## I. INTRODUCTION

### A. Background:

Machine learning can aid in early detection and prevention of skin diseases, ranging from acne to melanoma. This technology can save lives and reduce the severity of these conditions. Misdiagnosis is a common issue in healthcare, and machine learning algorithms trained on large datasets can improve accuracy. This can enhance healthcare delivery quality. Additionally, the project can promote skin health education, raising awareness about skin conditions, their causes, and prevention. This information can help improve skin protection and care, promoting better skin health.

Skin diseases can range from minor issues caused by bacteria, allergies, viruses or fungal infections to more serious conditions such as skin cancer. Recent researchers have found that the availability of cures for these diseases is higher if they are detected in the early stages. From a thorough literature survey, the authors of this paper have found that creating an

expert application for skin disease detection using methods like Naive Bayes algorithm can greatly assist healthcare professionals in accurately diagnosing and treating skin diseases.

Skin diseases can have a significant impact on an individual's physical and mental well-being. Early detection of skin diseases is crucial in preventing their spread and minimizing the potential complications. With the advancements in technology and the emergence of machine learning, there has been a significant transformation in various sectors, including healthcare. Skin disease prediction and health resource app is a promising application of these advancements that aims to provide a user-friendly platform for individuals to detect and manage their skin conditions effectively. In recent years, there has been a growing interest in utilizing technology to improve healthcare outcomes. One area that has gained significant attention is the prediction and comprehensive and robust solution for secure file sharing, management of skin diseases. To detect these diseases using the image processing method, many research papers have been published, and numerous researchers have contributed to this field by developing innovative approaches and algorithms [5].

Health resource applications play a crucial role in providing individuals with easy access to relevant health information, resources, and services. These apps can offer a wide range of features, including symptom checker tools, medication reminders, fitness trackers, and telemedicine capabilities.

### B. Problem Statement:

Skin illnesses are a common health concern around the world, and delayed diagnosis can exacerbate their impact. Timely detection is hampered by limited access to healthcare facilities, which is exacerbated by a lack of instruments for thorough health resource exploration. Furthermore, there is a

demand for honest price comparison websites due to the growing expense of pharmaceuticals. Existing solutions fall short of creating a cohesive application that addresses these issues, resulting in fragmented healthcare experiences. The development of an integrated Skin illness Prediction and Health Resource App that enhances accessibility and affordability in healthcare by combining precise illness prediction, spatial mapping of healthcare resources, and medication price comparison is therefore urgently needed.

### C. Objectives:

- 1) Automated Skin Disease Detector: Develop a system that can automatically detect and identify skin disease.
- 2) Accurate Classification: Ensure the system accurately classifies scars based on their type, size, and severity.
- 3) Real-time Processing: Enable real-time or near-real-time processing of images to provide quick results.
- 4) User-Friendly Interface: Create a user-friendly interface for both medical professionals and patients to interact with the system.
- 5) Interactive Map: This will allow the user to find the closest pharmacies, clinics and hospitals near them.
- 6) Shop: With the shop integration the user can compare drug prices across many platforms like Amazon and Flipkart
- 7) Data Management: Implement a robust data management system to store and retrieve patient information and images securely
- 8) Integration: Integrate with existing healthcare systems for seamless patient record-keeping.

Enhancing User Experience with Map and Shop Integration: The inclusion of an interactive map and a smooth purchasing experience in our app aims to make your health journey more intuitive and holistic. We hope to make it easier for you to find the closest pharmacies, clinics, hospitals by including an interactive map. This guarantees faster access to healthcare resources and makes navigating the app easier overall.

Concurrently, the shop function has been introduced to enable you to compare drug prices across many platforms, including well-known ones like Amazon and Flipkart. We recognize the importance of making educated and cost-effective selections when acquiring drugs. The goal of this integration is to give you an easy-to-use tool for price comparison and exploration, eventually encouraging economic healthcare decisions.

Our objective is to provide a holistic and user-centric experience in which you can effortlessly transition between forecasting skin diseases, locating nearby healthcare facilities, and making educated pharmaceutical purchases—all inside a single, user-friendly application.

## II. LITERATURE REVIEW

### A. Review of existing skin disease prediction and healthcare apps

Skin disease prediction apps have shown promising

results in diagnosing various dermatological conditions with high accuracy [1] [2]. These apps utilize deep learning techniques such as convolutional neural networks (CNN) to analyze skin conditions and make predictions based on image recognition [3]. By uploading photographs of skin lesions, the AI app can predict three diagnoses with a mean prediction accuracy of 96.1% for the top three anticipated diagnoses and 80.6% for the exact diagnosis [4]. The sensitivity and specificity of the app are 97% and 98% respectively, indicating its effectiveness in identifying dermatological diseases [5]. The use of AI algorithms in these apps reduces the need for manual feature extraction and data reconstruction, making the diagnosis process more efficient. Overall, these skin disease prediction apps have great potential for practical applicability in assisting dermatologists in diagnosing skin diseases accurately and efficiently.

An existing system for skin disease prediction using machine learning is the "Skin Vision" mobile application. Skin Vision uses a smartphone's camera to take pictures of skin lesions, moles, or other areas of concern. The application then employs machine learning algorithms to analyze the images and provide a risk assessment for skin cancer. Machine learning-based skin disease prediction apps like Skin Vision may offer risk assessments but may not provide definitive diagnoses, potentially leading to false positives or negatives. Privacy and security concerns arise as users must upload skin images, raising concerns about data privacy and healthcare regulations. Additionally, many apps lack sufficient educational content to help users understand skin conditions, risk factors, and prevention methods.

### A. Gap Analysis

As we explore the terrain of existing healthcare solutions, we see idiosyncrasies that present opportunities for improvement. Traditional techniques to skin disease diagnosis frequently lack the speed and precision required for timely action. Furthermore, the lack of a unified platform that smoothly integrates skin disease prediction, regional healthcare resource mapping, and pharmaceutical pricing comparison leads to fragmented user experiences.

Our investigation shows that a more cohesive, user-centered approach is required. A platform that not only properly forecasts skin disorders, but also overcomes geographical barriers to obtaining healthcare providers. Furthermore, there is a lack of a simple way for people to compare the costs of medications on various sites.

The purpose of bridging these gaps is to produce a more accessible, intuitive, and complete healthcare experience. Our objective is to enhance the overall quality, efficiency, and human-centeredness of your health journey by recognizing and taking advantage of these areas for development.

TABLE I. LITERATURE SURVEY

Sr. No:	Date and Publisher	Name	Flaws
1.	11 November 2020 IEEE	Deep Learning in Skin Disease Image Recognition: A Review	Limited scope Future directions
2.	28 January 2022 IEEE	Skin Disease Classification using Machine Learning Algorithms	The system is only trained on a small dataset of skin images
3.	24 February 2023 IEEE	Skin Disease Detection based on Machine Learning Techniques	The system is only able to classify skin diseases into two categories
4.	30 September 2018 IEEE	Diagnosis of skin diseases using Convolutional Neural Networks	The proposed system has not been tested on a large dataset of skin images

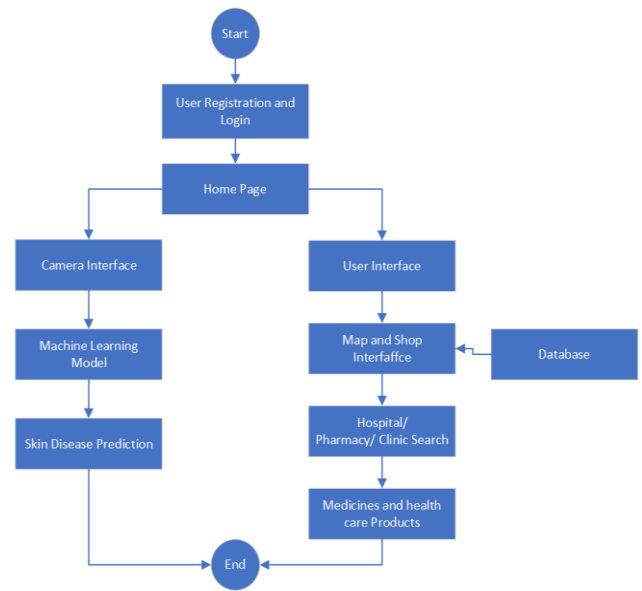


Fig. 1. Flowchart

### III. PROPOSED METHODOLOGY

#### A. Data Collection

**Capturing Real-World Skin Data:** To make our app as accurate as possible, we've gathered a diverse range of real-world skin data. Obtaining images that accurately represent the wide range of skin conditions that people may experience is necessary for this. In this way, we guarantee that our software is trained on an extensive dataset, improving its ability to identify a broad range of skin diseases.

#### B. Machine Learning Model

**Using Machine Learning's Power:** Robust machine learning algorithms provide the foundation of our application. These algorithms are made to learn and adapt over time, in addition to being capable of predict skin diseases. We've given our app the intelligence required to deliver precise and timely forecasts through rigorous training and validation, improving your capacity to take proactive measures in controlling the health of your skin.

#### C. App Development

**Creating an Intuitive User Experience:** Creating an app involves more than just technology—it also involves the users. The user experience has been painstakingly crafted to make sure using the app is simple and straightforward. We have made every step of the process, from uploading a skin picture to getting a forecast, user-friendly.

**Including Maps and Shopping:** We've included a map tool and a shopping option to help with the difficulties of locating affordable drugs and accessing healthcare providers. Access to healthcare resources is facilitated by the map, which makes it simple to find local pharmacies, clinics, and hospitals. You may compare drug costs across many platforms at the same time using the shop function, which gives you the flexibility to choose wisely when it comes to your medical purchases.

##### A. Architecture/ Framework

#### B. User registration and login system

- The User Registration and Login phase initiates the procedure.
- After logging in successfully, users are taken to the homepage.
- The homepage consists of recently taken images.
- Users can choose between two distinct interfaces from the main page:

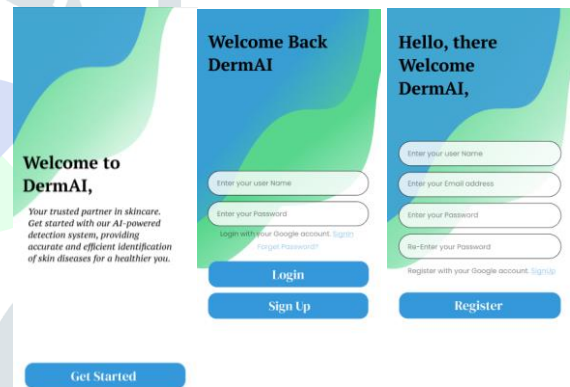


Fig. 2. Registration and Login Page

##### 1) Camera Interface

- Users can take pictures of their skin conditions using the camera interface. A machine learning algorithm processes the collected image in order to predict skin diseases.
- The application then predicts the disease and suggests recommended action for the same



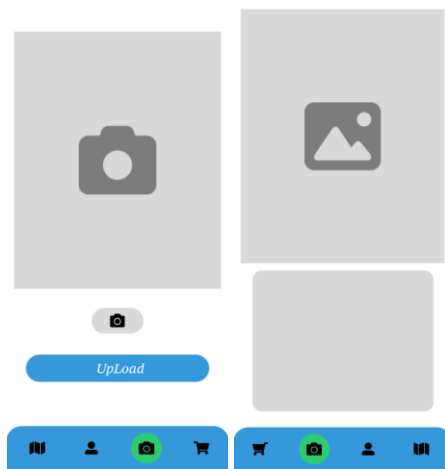


Fig. 3. Camera and Prediction Page

2) User Interface

- From the application's main page, users can access and browse via several interfaces.
- Users can locate nearby healthcare institutions or retailers by using this interface, which lets them examine maps and shop interfaces.
- In addition to exploring the medications and medical supplies that are accessible in relation to their needs or illnesses, users can search for local pharmacies, clinics, and hospitals.
- The database contains information on maps, stores, clinics, hospitals, pharmacies

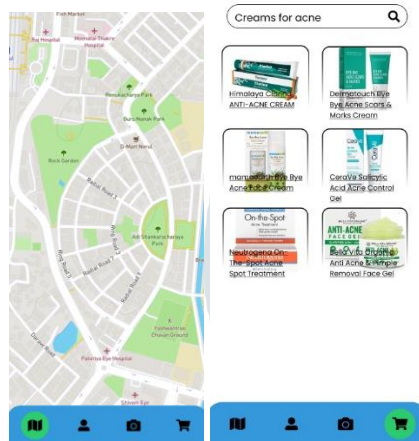


Fig. 4. Map and Shop Interface

3) User Console

The user console consists of four parts: Camera, Map, Shop, and Profile.

- Camera:** In which the app will start with the camera interface where we can click a photo of an infarcted area on the skin and the ML model will predict the infection
- Map:** In Map interface we can search for clinics, Pharmacies, and Hospitals near the user's location
- Shop:** In Shop the user can look for the medicines and compare price form different platforms that medicines is available

- Profile:** In the Profile Page the user can change their name, password, email and log out from the app.

IV. ALGORITHM USED

DermAI is a skin detection system app with an easy-to-use app/website interface that uses a Convolutional Neural Network (CNN) algorithm to discover and evaluate skin disorders. Users can submit an existing image of their skin condition or take a live photo using the camera feature in the app's menu bar. The CNN algorithm can quickly assess the image and identify possible diseases because it has been carefully trained with a variety of datasets that cover different types and conditions of skin. Users are provided with practical actions for therapy or management in addition to thorough information on the discovered disease and proposed solutions, all of which accompany each diagnosis. This allows users to gain deeper insights into their ailments.

CNN is a deep learning system that excels at tasks involving image processing and recognition. Convolutional, pooling, and fully connected layers are some of the layers that make it up.

The CNN algorithm in DermAI undergoes extensive training using a variety of datasets that cover a range of skin types and diseases. To improve the performance of the model, data augmentation techniques including flipping, rotating, and resizing the photos are used throughout the training phase. TensorFlow and PyTorch, two of Python's many libraries and frameworks, made model construction and testing more effective.



Fig.5. Working of the Algorithm

The user-uploaded photograph is processed by the CNN algorithm to detect possible illnesses. It accomplishes this by dissecting the image into smaller components and examining each one separately.

RESULTS, CONCLUSION AND FUTURE WORK

This section discusses obtained results in detail. With your credentials, you can access the program and log in. Your most recent photos will appear on the main screen after you log in.

With the app's built-in camera, you can snap a picture of your skin. A machine learning algorithm processes the collected image in order to predict skin diseases. The picture analysis is used by the program to forecast possible skin conditions. You can find nearby medical facilities or shops by looking at maps and shop interfaces. You can look up local clinics, pharmacies, or hospitals to see what medications and medical supplies are available for your needs or ailments.

#### A. Conclusion and Future work

An inventive app called the Scar Detection System was created to assist users in anticipating skin conditions and finding relevant medical supplies. With the help of this application, users can easily take pictures of their skin and receive predictions about possible skin disorders based on the analysis of the images. Additionally, the app's map feature allows users to see the locations of neighboring clinics, pharmacies, and hospitals.

The Camera Interface and the User Interface are the two primary interfaces in the application. With the use of the camera interface, users can take pictures of their skin conditions. A machine learning algorithm processes the collected image in order to predict skin diseases.

To sum up, the Scar Detection System is a safe and dependable tool for predicting skin conditions and finding relevant medical supplies. The purpose of the program is to give users an easy way to take pictures of their skin and apply image analysis to predict possible skin problems. Users of the app can also look for medications and medical supplies that are relevant to their needs or illnesses.

The program is linked to a database that contains information on shops, hospitals, pharmacies, clinics, maps, medications, and medical supplies. Users may quickly and easily find pertinent information with this database.

Further development of the application could involve incorporating additional features to improve its functionality. One possible addition may be a feature that enables users to track their skin condition over time and evaluate how well their treatment is working. One possible addition may be a feature that enables users to track their skin condition over time and evaluate how well their treatment is working. combining the app with wearable technology to get more user health data and deliver more individualized recommendation

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