

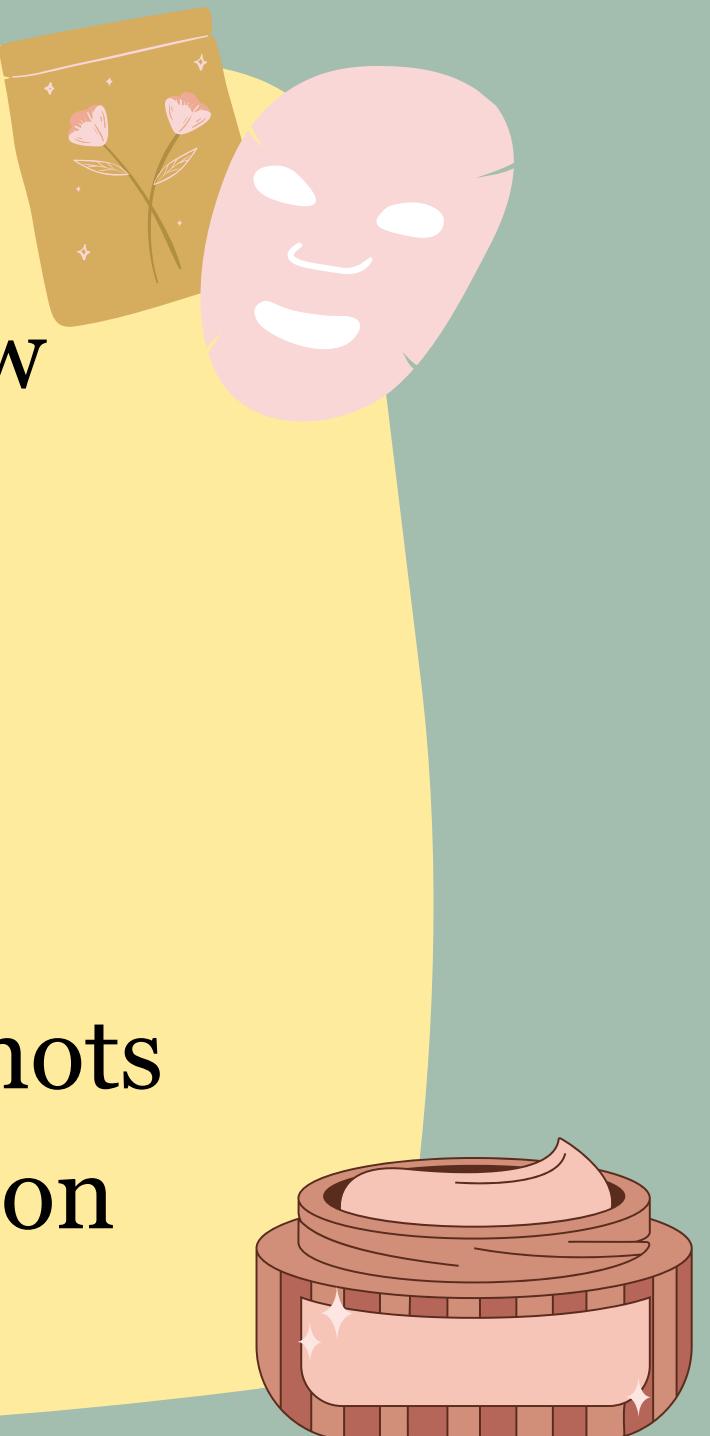
Advanced Skin Disease Diagnosis Leveraging Image Processing

● Team-2



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Introduction



- The project, "Advanced Skin Disease Diagnosis Leveraging Image Processing" focuses on developing a web application that utilizes advanced image processing techniques for diagnosing skin diseases.
- The platform is designed with a user-friendly interface that allows patients to upload their images, while medical experts can view results and provide further consultation.
- By utilizing advanced image processing techniques, the platform ensures accurate and timely diagnosis, assisting healthcare professionals in making better decisions with the help of automated analysis.

Project Overview



Customer Features

Create Account: Sign up by providing basic details to securely access the platform.

Login Page: Secure login to access their profiles and features.

Input Page: Can upload images of their skin for analysis.

View Page: Displays diagnostic results after processing the image, showing potential skin conditions and recommendations.





MILESTONE 1

Initial Setup & Basic Structure

- In Milestone 1, the goal is to establish the foundation of the project by setting up the Django application. This includes creating the core pages: Home, Login, Registration, and Profile.
- This milestone sets up user authentication and a structured interface, providing a strong foundation for further development.





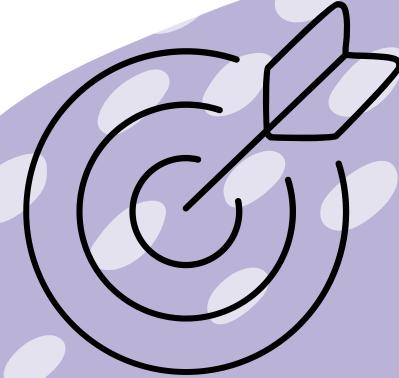
MILESTONE 2

Advanced Image Processing



- Milestone 2 focuses on integrating image processing features using OpenCV, including grayscale conversion, edge detection, and image resizing to improve analysis.
- This milestone ensures efficient advanced image processing, enhancing the application's functionality and accuracy in skin disease diagnosis.





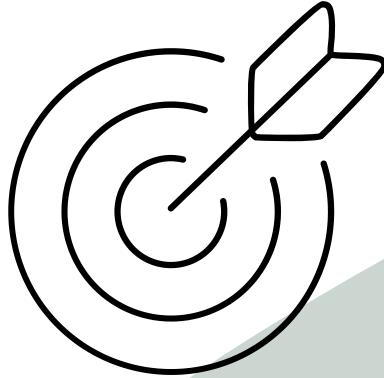
MILESTONE 3

UI-Based Image Processing and Dimension Calculation



- For Milestone 3, the focus is on implementing a user interface (UI) that allows users to upload an image, which is then processed using OpenCV to determine the dimensions of the skin disease area.
- This milestone ensures a seamless interaction for users, combining an intuitive UI with precise image processing capabilities to aid in accurate skin disease diagnosis.





MILESTONE 4

Skin Disease Random Forest Classifier



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- This milestone focuses on utilizing the processed and labeled skin disease dataset to train a machine learning model.
 - After evaluating multiple algorithms, we choose a Random Forest(RF) Model due to its robust performance with small-to-medium datasets and high-dimensional feature spaces.

Home Page

[Home](#) [Login](#) [Register](#) [About](#)

[Skin Disease Diagnosis](#)



Skin Diagnosis Platform

Welcome to our platform for diagnosing skin conditions. Here, you can get an instant diagnosis based on your symptoms, and explore more about various skin diseases.



About Skin Diagnosis

Explore the future of dermatological care at Skin Diagnosis, where cutting-edge image processing technology redefines skin health assessment. Our platform is designed for both patients and healthcare professionals, allowing easy image uploads and insightful analysis. With a focus on precision and efficiency, we support medical experts in delivering informed diagnoses and personalized treatment plans. Join us in revolutionizing skin health, where every diagnosis is a step towards improved well-being.



Registration Page

[Home](#) [Login](#) [Register](#) [About](#)

[Skin Disease Diagnosis](#)

Register

Username:

Password:

Password confirmation:

Register

Already have an account? [Login here](#)



Stay Connected

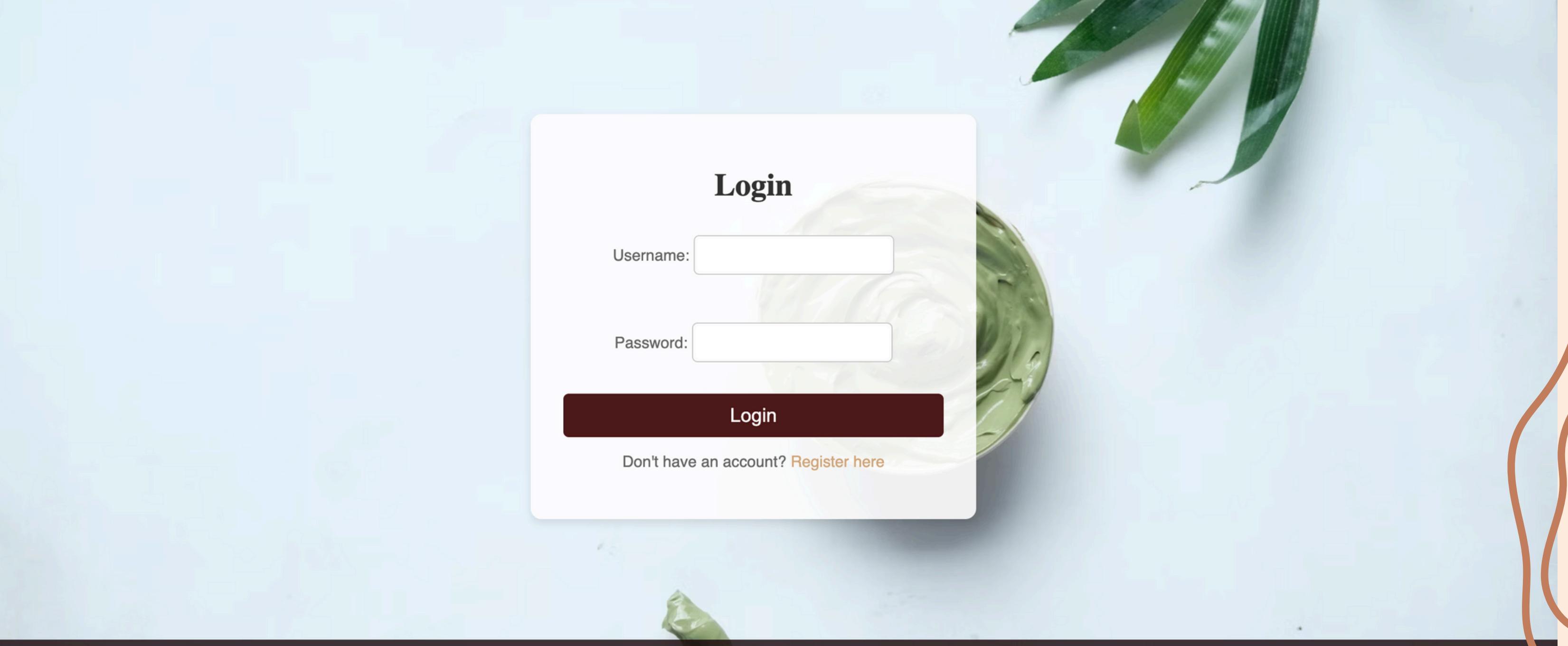
Follow us on our social media for updates and more skin care tips.



Login Page

[Home](#) [Login](#) [Register](#) [About](#)

[Skin Disease Diagnosis](#)



Login

Username:

Password:

[Login](#)

Don't have an account? [Register here](#)

Stay Connected

Follow us on our social media for updates and more skin care tips.



Profile Page

[Home](#) [Logout](#) [Register](#) [About](#)

Skin Disease Diagnosis

Welcome to the Skin Disease Diagnosis Web App

How It Works

We're here to help you. Follow these steps to upload your image securely:

1. Ensure your image clearly shows the skin area in question.
2. Click the "Choose File" button below to select your image.
3. Once you've selected an image, click "Submit."
4. Our system will analyze your image and provide feedback.

Rest assured, your privacy is important to us, and all images are handled securely.

Upload Your Image



Choose Image File:

No file chosen

Stay Connected

Follow us on our social media for updates and more skin care tips.

Diagnosis Result

[Home](#)[Logout](#)[Register](#)[About](#)[Skin Disease Diagnosis](#)

How It Works

We're here to help you. Follow these steps to upload your image securely:

1. Ensure your image clearly shows the skin area in question.
2. Click the "Choose File" button below to select your image.
3. Once you've selected an image, click "Submit."
4. Our system will analyze your image and provide feedback.

Rest assured, your privacy is important to us, and all images are handled securely.

Upload Your Image



Choose Image File:

No file chosen

Skin Disease Detected:

Nail Fungus

Diagnosis Result:

Nail fungus, also known as onychomycosis, is a common infection that affects the fingernails or toenails. Diagnosis typically involves a visual examination of the nail, along with a scraping or clipping of the affected nail to examine for fungal elements.



Model Description



Random Forest & PCA Modeling:

The skin disease classification model utilizes a Random Forest Classifier (RFC) combined with Incremental Principal Component Analysis (PCA) to accurately predict skin disease categories. Images are resized to 128x128 pixels, and color histograms are extracted to capture key features.

Incremental PCA reduces the high-dimensional feature space, making the dataset more manageable while preserving essential information. This approach ensures computational efficiency and robustness in handling large datasets.

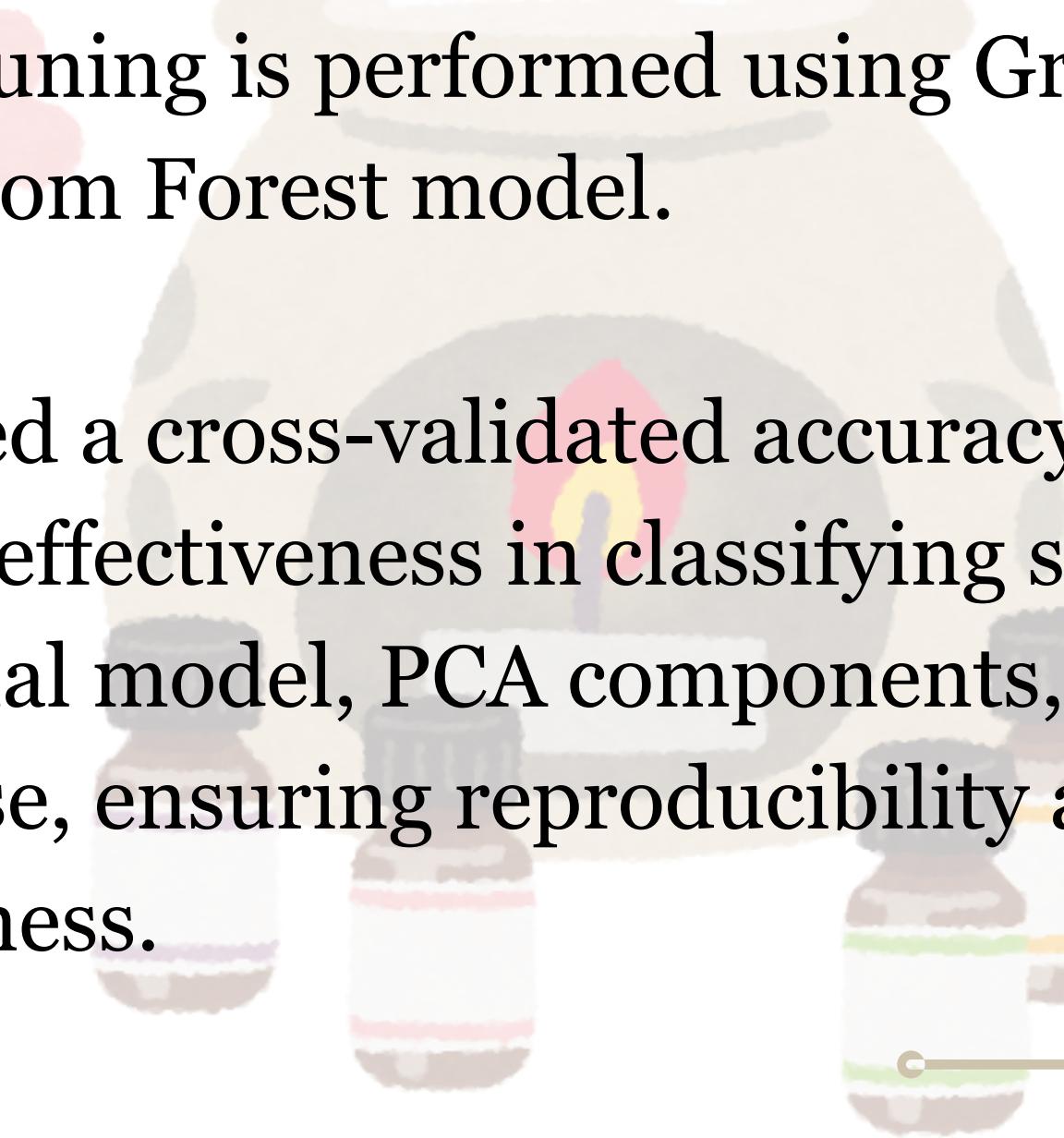


Methodology & Results



The preprocessed data is split into training and testing sets, with class imbalance handled using computed class weights.

Hyperparameter tuning is performed using GridSearchCV to optimize the Random Forest model.



The model achieved a cross-validated accuracy of 82.16%, demonstrating its effectiveness in classifying skin diseases accurately. The final model, PCA components, and scaler are saved for future use, ensuring reproducibility and deployment readiness.



Conclusion

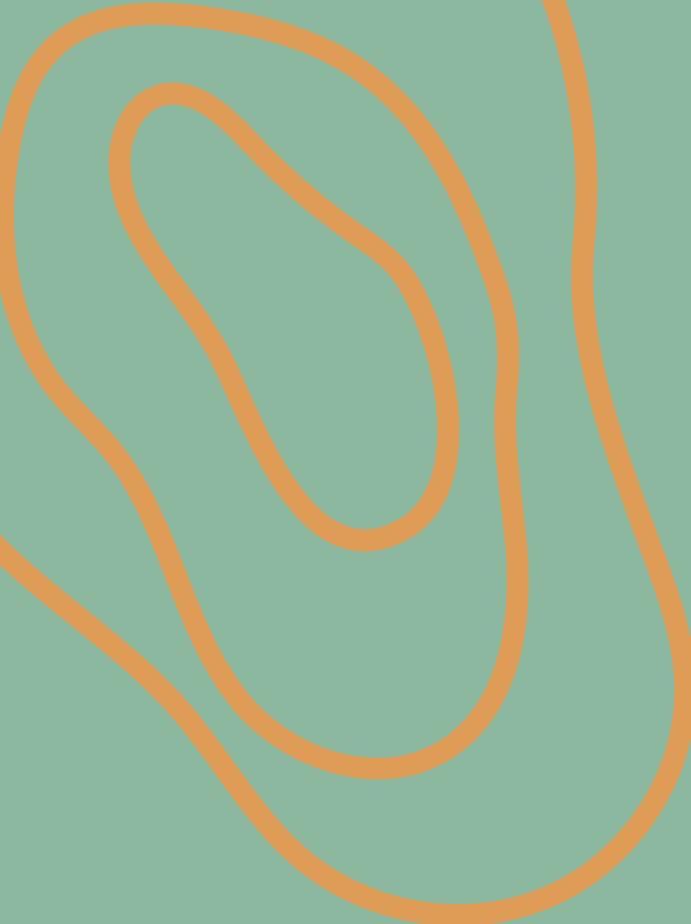


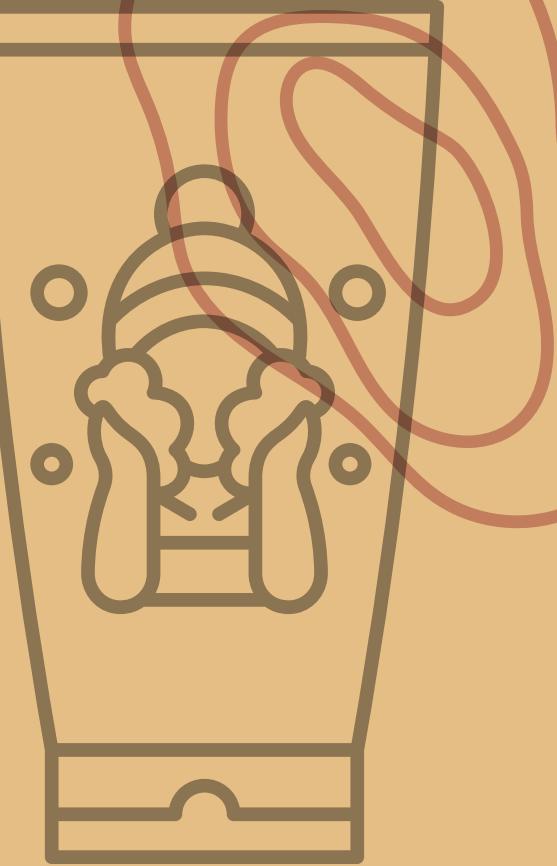
This project combined OpenCV for image processing with Django for web development to classify skin diseases. Using Random Forest and Incremental PCA, the model achieved 82.16% accuracy. It shows the potential for creating user-friendly, scalable tools for early skin disease detection in healthcare.



Team Members

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Thank You !!

