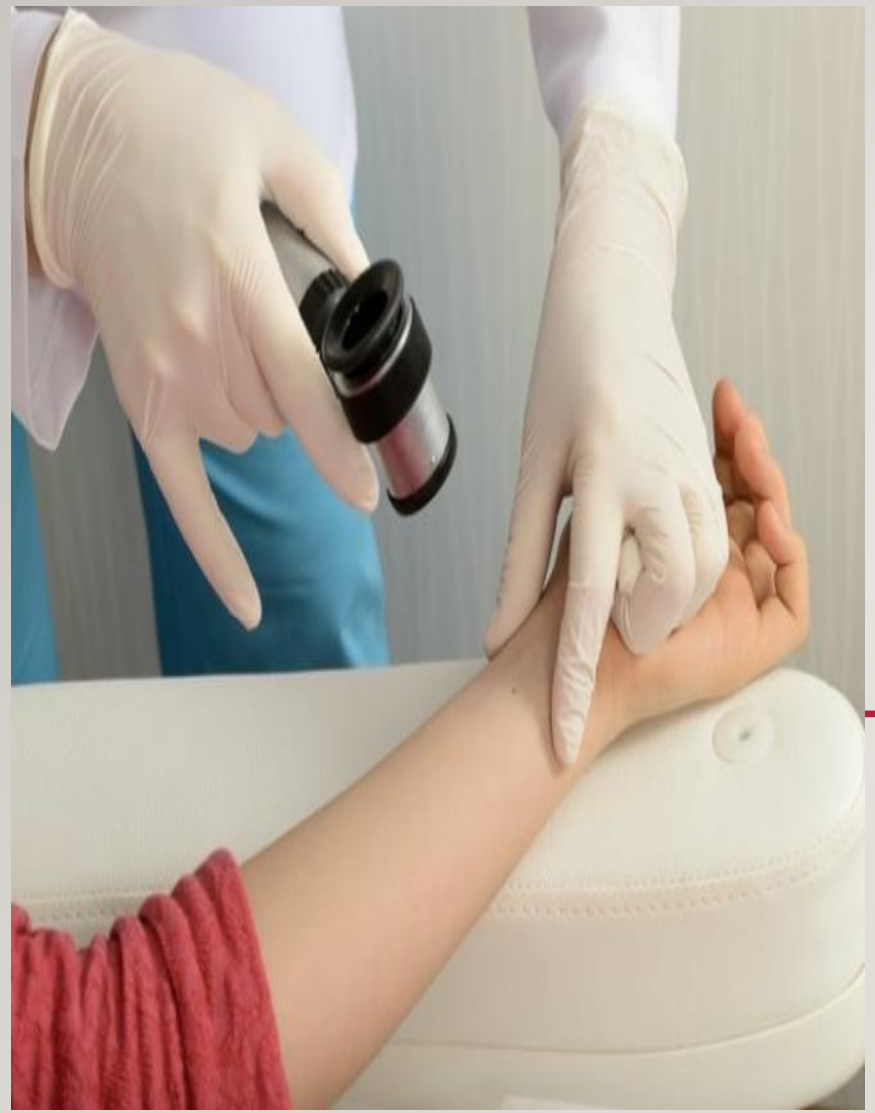

SKIN CANCER CLASSIFICATION AND DETECTION

PRESENTED BY,

SUPREETHA

Contents

- Introduction
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- Workflow
- Methodology
- User interface
- Conclusion
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Introduction

- Skin cancer classification and detection using deep learning project aimed at assist in the early detection and classification of skin lesions.

- This project analyze images and identify different types of skin lesions.

- The goal of this project is to create a reliable and accurate system that helps dermatologists and healthcare professionals diagnose skin cancer more efficiently and effectively.

Objectives

- **Accurate Classification**: Develop machine learning models capable of accurately classifying dermatological images into different categories such as benign, malignant, or specific types of skin cancer.
- **Early Detection**: Enable early detection of skin cancer by creating algorithms that can identify subtle signs of malignancy in skin lesions, potentially leading to timely medical intervention and improved patient outcomes.
- **Real-Time Detection**: Implement algorithms capable of real-time detection and classification of skin lesions, allowing for quick and efficient diagnosis during clinical examinations or through mobile applications.

Cont..

- **Accessible Healthcare**: Improve access to skin cancer diagnosis, especially in underserved areas, by leveraging machine learning technologies to assist healthcare providers in triaging and diagnosing skin lesions accurately.
- **Scalability and Generalization**: Develop models that are scalable and generalize well across diverse populations and skin types, ensuring their effectiveness in various clinical settings and demographics.

Technology Used

HARDWARE REQUIREMENTS

- RAM: 8 GB or higher
- Storage: 256 GB SSD or higher
- Network: Ethernet/Wi-Fi for internet connectivity
- Display: 15-inch monitor or larger
- Processor: Intel Core i5 or equivalent

LANGUAGES USED

- Front-end: HTML, CSS, Javascript
- Back-end: Python, Flask

Front-End

HTML(Hyper Text Mark Up Language)

Used for structuring the web pages and forming the layout of the user interface.

CSS(Cascading Style Sheet)

Applied for styling the web pages, making the interface visually appealing and responsive.

JavaScript

Utilized for adding interactivity to the web pages, such as handling user inputs and dynamic content updates.

Back-End

Python

- The programming language used to develop the core logic of the application.
- Handles image processing tasks, such as loading, resizing, and preprocessing images for classification.

Flak

- A lightweight and versatile web framework for Python.
- Manages routes, such as the home page and the prediction endpoint, ensuring smooth navigation and user experience.
- Facilitates communication between the frontend and backend

Algorithm

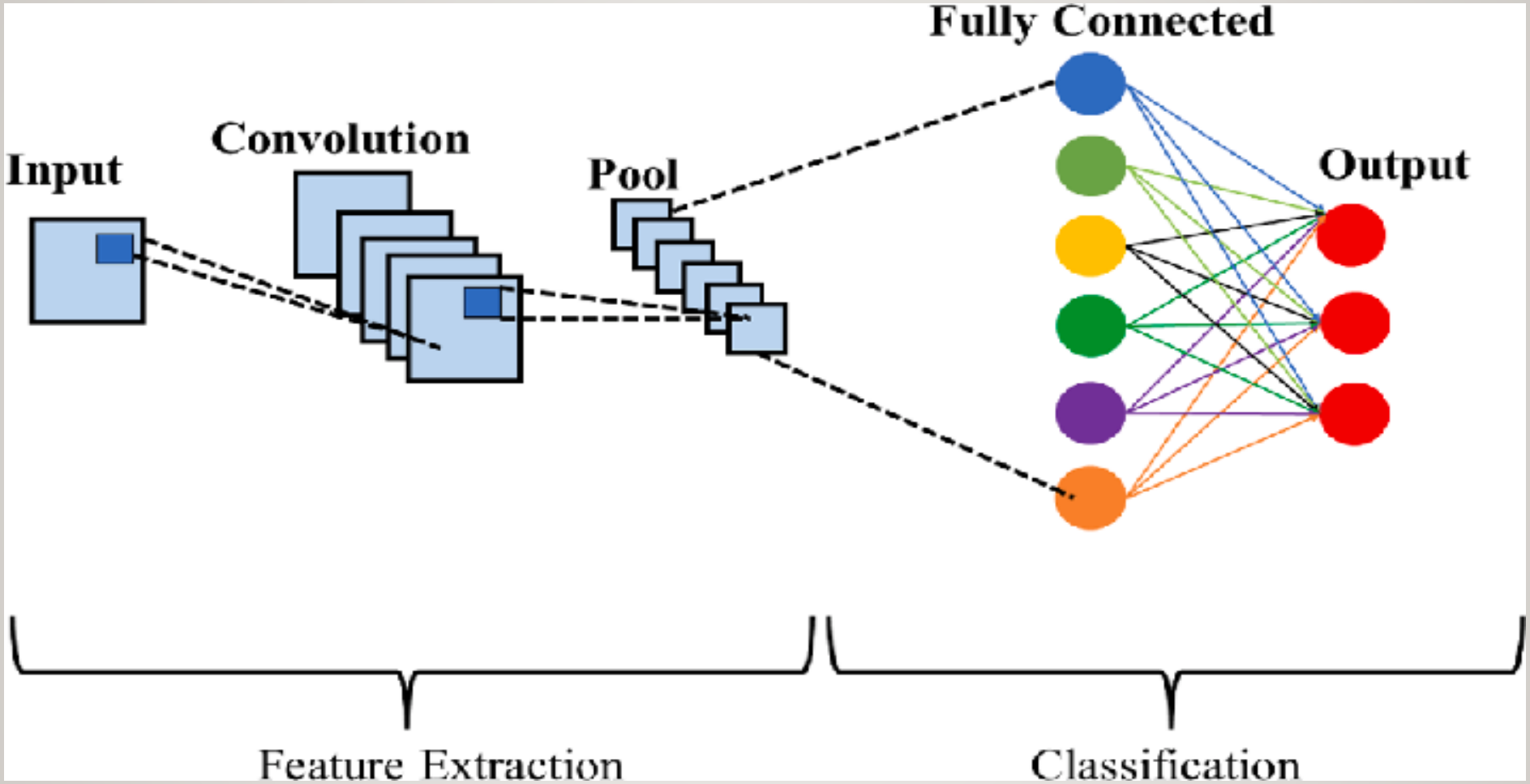
Convolutional Neural Network(cnn)

- CNNs automatically learn important features from images, so there's no need to manually identify and extract these features.

- CNNs consist of multiple layers, including convolutional layers for feature extraction, pooling layers for dimensionality reduction, and fully connected layers for final classification.

- CNNs achieve high accuracy in image-related tasks by capturing complex patterns and hierarchical structures in the data, making them suitable for skin disease classification in this project.

Algorithm


Fully Connected
Input
Convolution
Pool
Output
Feature Extraction
Classification

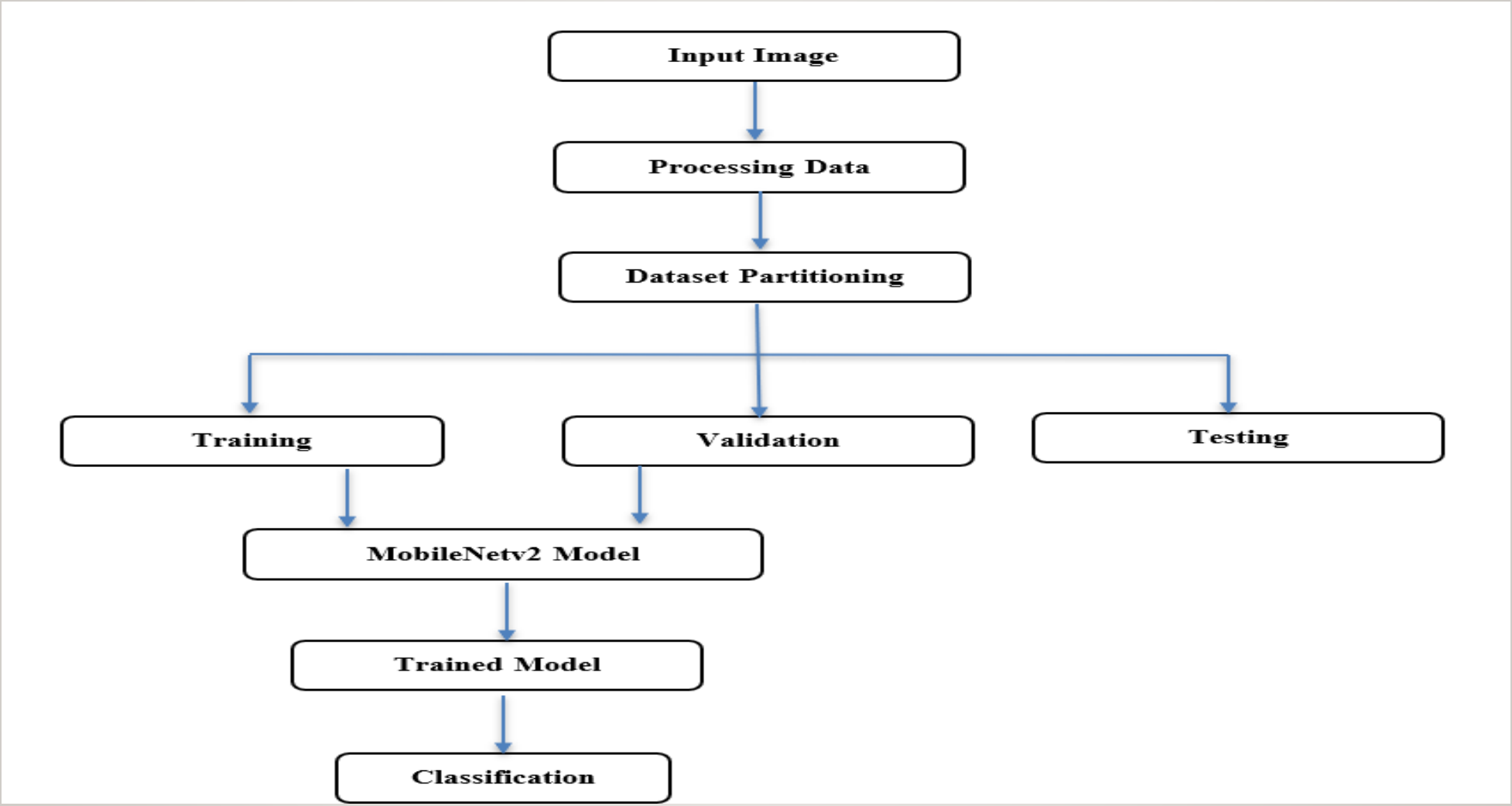
Cont…

Convolutional Layer : The Convolutional Layer applies multiple filters to detect features like edges and textures, producing feature maps that highlight important details.

Pooling Layer : The Pooling Layer reduces the feature map's dimensionality to decrease computational load.

Fully Connected Layer : This classifies the input by combining the extracted features and producing the final classification probabilities.

Work Flow


Input Image
Processing Data
Dataset Partitioning
Training
Validation
Testing
MobileNetv2 Model
Trained Model
Classification

Methodology

- **Data Collection:**
  - Gathered skin cancer images from reputable sources.
  - Labeled images into various categories .

- **Data Preprocessing:**
  - Resized images to 224x224 pixels.
  - data augmentation (e.g., rotation, flipping).

Cont..

- **Model Training:**
  - Used MobileNetV2 for feature extraction.
  - Added custom dense layers for classification.
- **Model Evaluation:**
  - Evaluated model using accuracy, confusion matrix, and classification report.

Cont..

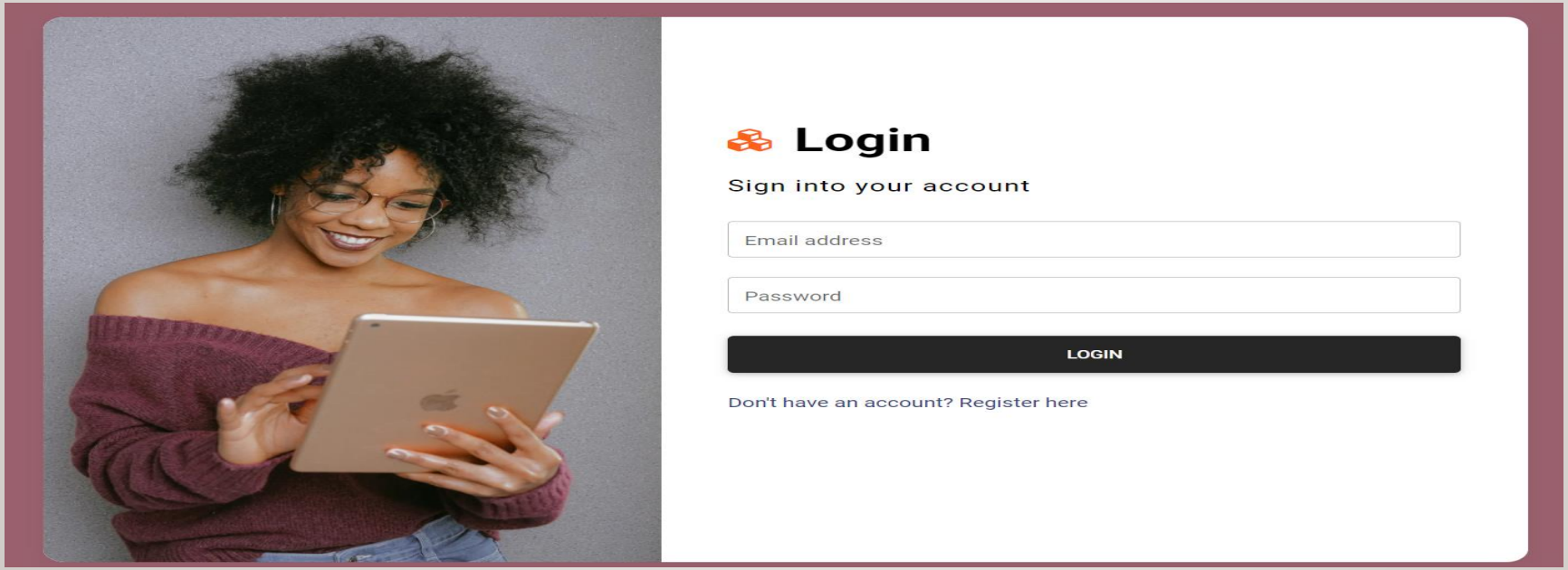
Classification

- The trained CNN model classified skin lesions into various categories with high accuracy.
- Features extracted during training were used to differentiate between benign and malignant lesions.
- The model also identified specific types of skin cancer.

User Interface

Login Page:

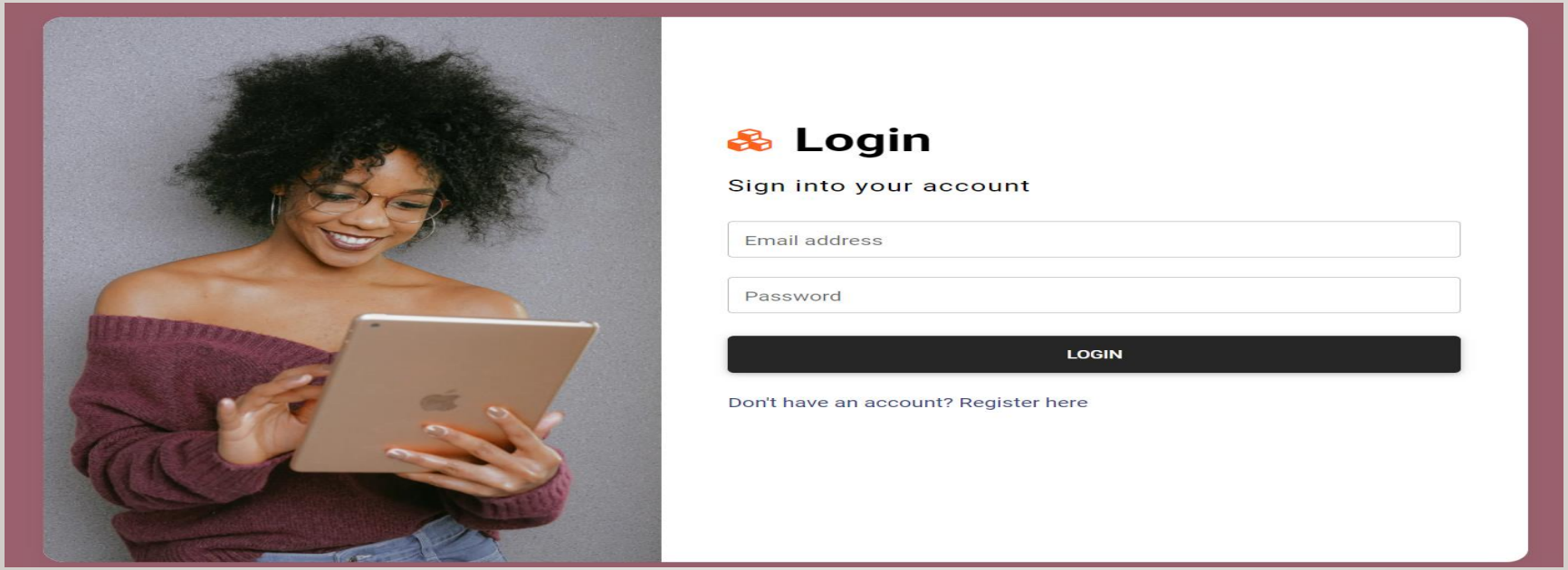
The login page secures system access by prompting users to enter their username and password, ensuring only authorized personnel can access sensitive patient data.



User Interface

Registration Page:

The login page secures system access by prompting users to enter their username and password, ensuring only authorized personnel can access sensitive patient data.

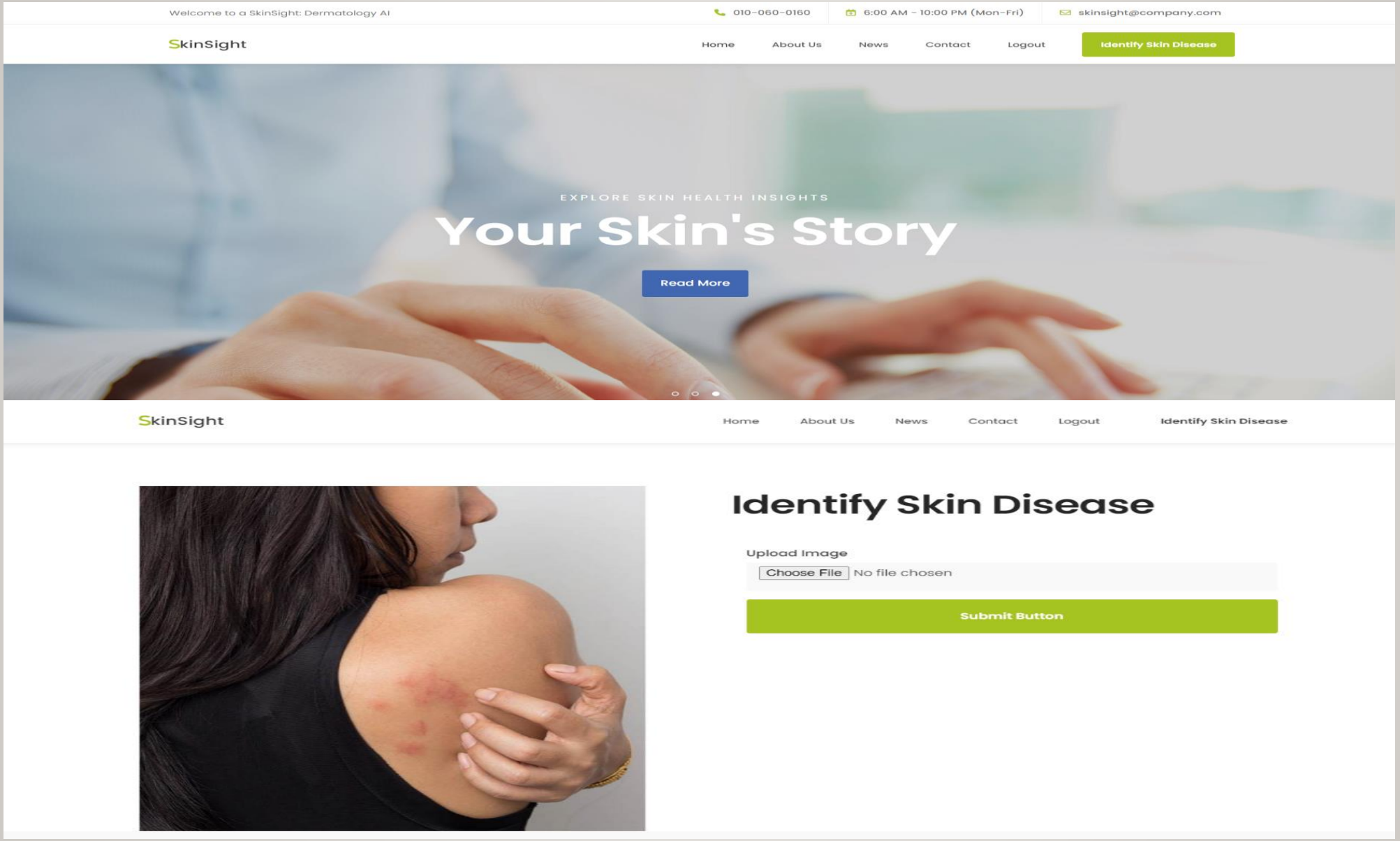


User Interface

Dashboard:

- **Home:** Guides users through the diagnostic process with upload instructions.
- **About Us:** Explains the system's purpose, technology, team, and healthcare goals.
- **News:** Shares updates and research on skin cancer diagnosis and treatment.
- **Contact:** Offers contact information and support resources.
- **Identify Skin Disease:** Lets users upload skin images for diagnostic predictions and reports.

Cont...


Welcome to a SkinSight: Dermatology AI
010-060-0160
6:00 AM - 10:00 PM (Mon-Fri)
skinsight@company.com
SkinSight
Home
About Us
News
Contact
Logout
Identify Skin Disease
EXPLORE SKIN HEALTH INSIGHTS
Your Skin's Story
Read More
SkinSight
Home
About Us
News
Contact
Logout
Identify Skin Disease
Identify Skin Disease
Upload Image
Choose File
No file chosen
Submit Button

Cont...

- **Image of the Skin Lesion**

The uploaded image of the skin lesion is prominently displayed on the left side of the page.

- **Predicted Result**

The page shows the predicted result of the analysis, indicating the type of skin disease.

Example: "Predicted Result: Melanoma"

- **Description of the Disease**

A brief description of the predicted skin disease is provided.

Example: "Melanoma is a type of skin cancer that can spread to other organs."

Cont...

- **Confidence Score**

The confidence score of the prediction is displayed, reflecting the model's certainty.

Example: "Confidence: 0.99999785"

- **Cancerous Status**

Information on whether the lesion is classified as cancerous or not.

Example: "Cancerous: Yes"

- **Treatment Options**

A section detailing possible treatment options for the identified skin disease.

Example: Treatments include surgery, radiation, medications, and in some cases chemotherapy.

Cont...

SkinSight

Home About Us News Contact Logout Identify Skin Disease

Predicted Result: Melanoma

Melanoma is a type of skin cancer that can spread to other organs.

Confidence

> 0.99999785

Cancerious

> Yes

Treatment Options

- > Treatments include surgery, radiation, medications, and in some cases chemotherapy.

Conclusion

- our project uses advanced technology like Convolutional Neural Networks (CNNs) to classify skin images accurately. This improves early detection of skin conditions.
- This approach not only facilitates early detection but also holds promise for enhancing patient care by providing timely and reliable diagnostic insights.

Future Enhancement

- Expanded dataset to include diverse skin types, lesion types, and demographic details.
- Integration of multimodal data such as patient medical history, genetic information, and clinical notes.
- Utilization of advanced deep learning techniques like transfer learning and ensemble methods.
- Development of a user-friendly mobile application for real-time image capture and analysis.
- Enhanced user interface and accessibility for broader usage, especially in underserved areas.

THANK YOU