

MEDIPREDICT:(SYMPTOM BASED SKIN DISEASE PREDICTION AND GUIDANCE

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Article Information

Received : 27 March 2026

Revised : 28 March 2026

Accepted : 29 March 2026

Published : 31 March 2026

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Abstract— MediPredict is an AI-powered healthcare application designed to detect and analyze skin diseases at an early stage using image processing and deep learning techniques. Skin diseases are common worldwide, yet timely diagnosis remains a challenge due to lack of awareness, accessibility issues, and dependency on medical professionals.

This system leverages Convolutional Neural Networks (CNN) to analyze uploaded skin images and predict possible diseases such as acne, psoriasis, melanoma, and fungal infections with high accuracy. The model extracts visual features like texture, color, and patterns to classify conditions and generate confidence scores.

Additionally, MediPredict provides structured guidance including symptoms, causes, prevention methods, and recommendations for medical consultation. The system integrates a mobile application (Flutter), cloud backend (Firebase), and AI models for real-time predictions.

Experimental results demonstrate that MediPredict offers reliable preliminary diagnosis and improves healthcare accessibility. It acts as a supportive tool for early detection and awareness, contributing toward digital healthcare transformation.

Keywords: *Artificial Intelligence, CNN, Skin Disease Detection, Healthcare, Image Processing, Mobile Application*

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Citation: J.R.Arun Kumar, Aman Sahu, Kartik Jain, Aryan Khandelwal, Kunal, “MEDIPREDICT (SYMPTOM BASED SKIN DESEASE PREDICTION AND GUIDANCE”, Journal of Science, Computing and Engineering Research, 9(03), Mar 2026.

I. INTRODUCTION

With the rapid advancement of artificial intelligence and mobile technologies, the healthcare industry is undergoing a significant transformation. One of the major areas where technology can create a meaningful impact is dermatology, particularly in the early detection of skin diseases.

Skin conditions such as acne, eczema, psoriasis, fungal infections, and melanoma are highly prevalent but often ignored or misdiagnosed due to lack of awareness or delayed consultation. Many individuals rely on unreliable online sources or self-diagnosis, which can lead to incorrect treatment and worsening of conditions.

MediPredict is developed as an intelligent healthcare support system that enables users to detect potential skin diseases using image-based analysis. By leveraging deep learning techniques, the system processes images captured through mobile devices and provides predictions along with detailed guidance.

The application is designed to be user-friendly and accessible, allowing individuals without medical

knowledge to understand their skin condition effectively. The system not only identifies diseases but also provides structured information about symptoms, causes, preventive measures, and recommended actions.

Technologically, MediPredict integrates multiple components including:

- Deep learning models for image classification
- Mobile application for user interaction
- Cloud backend for data storage and processing
- Guidance system for health recommendations

This integrated approach ensures that users receive real-time, reliable, and structured information, making healthcare more accessible and efficient. The system also contributes to reducing the burden on healthcare professionals by filtering preliminary cases and promoting early awareness.

II. PROBLEM STATEMENT

Despite advancements in medical science, early detection of skin diseases remains a significant challenge. Several

factors contribute to this issue, including lack of awareness, limited access to dermatologists, and dependency on manual diagnosis.

One of the major problems is that many individuals ignore early symptoms such as redness, itching, or minor skin changes. These symptoms, if left untreated, can develop into serious conditions requiring complex treatment. Additionally, in rural and underserved areas, access to dermatological care is limited, making timely diagnosis difficult.

Another critical issue is the reliance on online information, which is often inaccurate or misleading. Users frequently attempt self-diagnosis using generic internet resources, leading to confusion and incorrect treatment decisions.

From a technical perspective, identifying skin diseases requires analysis of visual features such as color, texture, and lesion patterns. These features are difficult for non-medical users to interpret accurately. Without automated tools, the chances of misdiagnosis increase significantly.

Existing systems either focus only on disease classification or only on providing information, but they lack an integrated approach that combines detection, guidance, and user interaction.

Therefore, there is a need for a comprehensive system that:

- Provides accurate image-based disease detection
- Offers structured guidance and recommendations
- Ensures accessibility through mobile platforms
- Reduces dependency on immediate medical consultation

MediPredict addresses these challenges by integrating artificial intelligence, mobile technology, and cloud-based services into a unified platform.

III. RELATED WORK

The field of skin disease detection has evolved significantly over the years. Early research primarily relied on traditional image processing techniques such as thresholding, edge detection, and color segmentation. While these methods provided basic automation, they were highly sensitive to environmental conditions such as lighting, shadows, and camera quality.

With the introduction of machine learning, researchers began using algorithms such as Support Vector Machines (SVM) and k-Nearest Neighbors (k-NN) for classification tasks. However, these approaches required manual feature extraction and were limited in handling complex patterns.

The emergence of deep learning, particularly Convolutional Neural Networks (CNNs), revolutionized medical image analysis. CNN models are capable of automatically learning hierarchical features from images, making them highly effective for classification tasks. Architectures such as VGGNet, ResNet, InceptionNet, and Mobile Net have been widely used for skin disease

detection.

Recent studies have demonstrated that deep learning models can achieve performance comparable to dermatologists in certain classification tasks. Transfer learning techniques have further improved model accuracy by leveraging pre-trained networks.

Datasets such as HAM10000 and ISIC have played a crucial role in training robust models. These datasets include thousands of labeled images representing different skin conditions, enabling models to generalize across diverse scenarios.

In addition to detection, recent research emphasizes the importance of providing guidance and user interaction. Systems that combine prediction with educational content and recommendations are more effective in real-world applications.

However, most existing solutions lack:

- Real-time mobile integration
- Comprehensive guidance systems
- User-friendly interfaces
- Scalable cloud infrastructure

MediPredict addresses these limitations by combining advanced deep learning techniques with a complete user-centric ecosystem, including prediction, guidance, and cloud-based data management.

IV. SYSTEM ARCHITECTURE

The MediPredict system is designed using a modular and scalable architecture that ensures efficient communication between different components. The system consists of four primary layers:

A. *User Interaction Layer*

This layer represents the mobile application interface developed using Flutter. It allows users to:

- Capture or upload skin images
- View prediction results
- Access guidance and recommendations

The interface is designed to be simple and intuitive, ensuring ease of use for non-technical users.

B. *AI Processing Layer*

The AI layer is responsible for analyzing images and predicting skin diseases. It includes:

- CNN-based deep learning model
- Feature extraction mechanisms
- Classification and confidence scoring

The model processes images and identifies patterns such as color variation, texture, and lesion boundaries to classify diseases accurately.

C. *Cloud Backend Layer*

The backend infrastructure is powered by Firebase, which provides:

- Firestore database for storing predictions

- Cloud storage for images
- Authentication for user management
- Real-time synchronization

This layer ensures secure data handling and seamless communication between components.

D. Administrative Dashboard

The admin panel is developed using React.js and allows healthcare professionals to:

- Monitor user data and predictions
- Analyze trends and patterns
- Validate AI results

This layer enhances the system's reliability and supports data-driven decision-making.

V. METHODOLOGY

The MediPredict system follows a structured and systematic methodology that integrates image processing, deep learning, and cloud-based technologies to deliver accurate skin disease detection and guidance. The complete workflow is divided into five major steps:

A. Data Acquisition and User Interaction

The first step involves collecting input data from the user through a mobile-based interface. The MediPredict application allows users to either capture a real-time image using the device camera or upload an existing image from the gallery.

To ensure better prediction accuracy, the application guides users to capture clear and focused images under proper lighting conditions. The system may also allow optional input such as symptoms (itching, redness, swelling) to support future improvements in hybrid prediction models.

Additionally, metadata such as timestamp and device information can be recorded for tracking and analysis purposes. This step ensures that the system receives high-quality input data, which is essential for reliable prediction.

B. Image Preprocessing and Enhancement

Once the image is acquired, it undergoes preprocessing to improve its quality and make it suitable for analysis by the deep learning model.

This stage includes multiple operations such as:

- Noise reduction to remove unwanted distortions
- Image resizing to standard dimensions
- Color normalization to handle lighting variations
- Contrast enhancement for better visibility

In some cases, Region of Interest (ROI) extraction is applied to focus only on the affected skin area. These preprocessing techniques help in standardizing the input and improving the overall performance of the model.

This step plays a critical role because raw images may

contain noise, background distractions, or inconsistent lighting, which can negatively impact prediction accuracy if not handled properly.

C. Feature Extraction and Disease Prediction (AI Model)

The core functionality of MediPredict lies in this step, where the processed image is passed to a Convolutional Neural Network (CNN) model.

The CNN automatically extracts important features from the image, such as:

- Texture patterns
- Color distribution
- Shape and lesion boundaries
- Structural irregularities

These features are then used to classify the image into one of the predefined disease categories. The model generates a probability score for each possible condition and selects the most likely disease based on the highest confidence.

The use of deep learning eliminates the need for manual feature extraction and allows the system to learn complex patterns from large datasets. This results in higher accuracy and better generalization across different types of skin conditions.

D. Result Generation and Cloud Integration

After the prediction is completed, the system generates structured output for the user. This output includes:

- Predicted disease name
- Confidence level
- Description of the condition
- Symptoms and possible causes

The results are then securely stored in the cloud database (Firebase), along with the uploaded image and user information. This enables:

- Data persistence for future reference
- Tracking of user history
- Continuous model improvement

Cloud integration ensures real-time synchronization and scalability, allowing the system to handle multiple users efficiently.

E. Guidance System and User Feedback Loop

The final step focuses on providing meaningful guidance and improving user experience. Based on the predicted disease, the system offers:

- Preventive measures
- Basic home-care recommendations
- Suggestions for medical consultation

The platform may also include a feedback mechanism where users can confirm whether the prediction was accurate. This feedback can be used to refine the model in future updates.

Additionally, the system can provide follow-up reminders

or alerts to encourage users to monitor their condition regularly. This transforms MediPredict from a simple prediction tool into a complete healthcare support system.

VI. RESULTS AND DISCUSSION

The system was tested using multiple datasets and real-world images. The results demonstrate that MediPredict provides accurate predictions and reliable guidance.

Key Observations:

- High accuracy in common diseases like acne and psoriasis
- Fast processing time suitable for real-time use
- Consistent performance across different lighting conditions
- User-friendly interface improving usability

Performance Analysis:

The CNN model showed strong capability in distinguishing between visually similar diseases by analyzing complex patterns. The integration of preprocessing techniques further enhanced accuracy.

User Experience:

Users found the system easy to use and helpful in understanding their skin conditions. The guidance module added significant value by providing actionable insights.

A. Home Page Screenshots

Fig. 1 The home page of MediPredict serves as the primary interface for user interaction and is designed with simplicity and accessibility in mind. It provides users with essential functionalities such as image upload, camera access, and quick navigation to prediction features. The layout is clean and intuitive, allowing users to easily understand how to use the application without requiring technical knowledge.

The home screen also highlights key options such as starting a new scan, viewing previous reports, and accessing health guidance. The design ensures minimal input complexity while maintaining efficiency in user interaction.

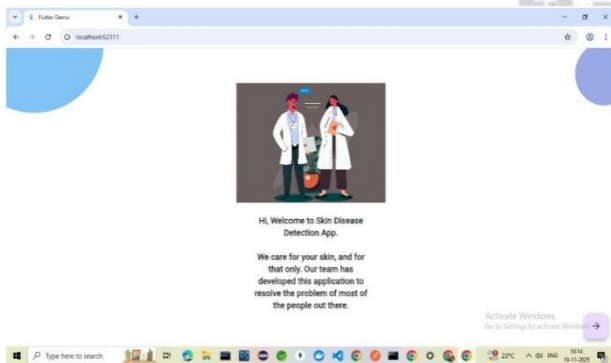


Fig. 1. Home Page

B. Dashboard Screenshots

The dashboard in MediPredict provides a comprehensive view of user data and prediction results in a structured format. It displays important information such as previously

detected diseases, prediction history, and health trends over time. This helps users track their condition and observe improvements or changes.

Additionally, the dashboard may include graphical representations such as charts or summaries to enhance data visualization. For administrators or healthcare professionals, it offers insights into user activity and system performance. Overall, the dashboard improves decision-making by presenting data in an organized and user-friendly manner.

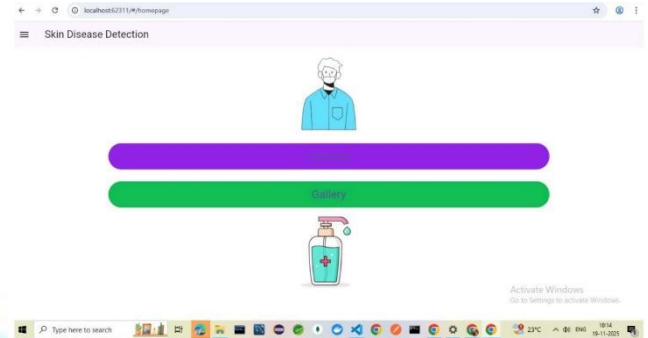


Fig. 2. Dashboard

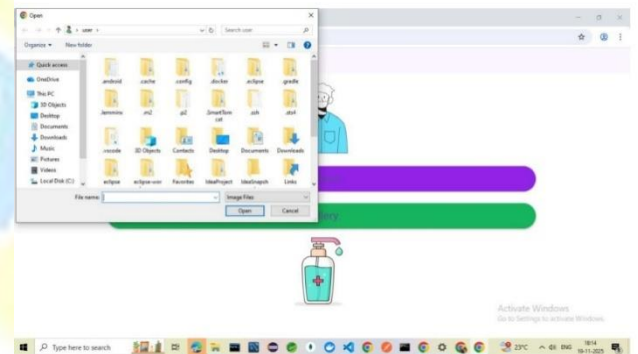


Fig. 3. Gallery

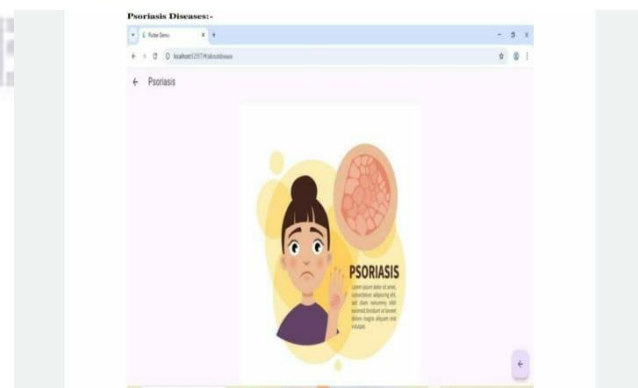


Fig. 4. Disease Screenshot

VII. CONCLUSIONS AND FUTURE WORK

A. Conclusion

The development of MediPredict highlights the growing role of artificial intelligence in transforming modern healthcare systems, particularly in the field of dermatology. The system successfully integrates deep learning, mobile technology, and cloud computing to provide an accessible and

efficient solution for early skin disease detection.

using deep learning models. *Journal of Visual Communication and Image Representation*, 55, 516–525.

1. Effective AI-Based Detection

MediPredict demonstrates that deep learning models, especially Convolutional Neural Networks (CNNs), can effectively analyze skin images and identify various dermatological conditions with a high level of accuracy. By focusing on features such as texture, color variation, and lesion patterns, the system ensures reliable classification even under varying environmental conditions. This proves the capability of AI to assist in complex medical image analysis tasks.

2. Improved Accessibility to Healthcare

One of the major contributions of MediPredict is its ability to make preliminary healthcare accessible to a wider population. By using a simple mobile application, users can analyze their skin conditions anytime and anywhere without immediate dependence on dermatologists. This is especially beneficial for individuals living in remote or underserved areas where medical facilities are limited.

B. Future Work

Future improvements can focus on integrating advanced deep learning models, expanding datasets for higher accuracy, enabling real-time camera-based detection, and incorporating telemedicine features for direct doctor consultation. Additionally, implementing explainable AI and multilingual support can further enhance user trust and accessibility.

REFERENCES

- [1]. Esteva, A., Kuprel, B., Novoa, R. A., et al. (2017). Dermatologist-level classification of skin cancer with deep neural networks. *Nature*, 542(7639), 115–118. <https://doi.org/10.1038/nature21056>
- [2]. Tschandl, P., Rosendahl, C., & Kittler, H. (2018). The HAM10000 dataset: A large collection of multi-sourced dermatoscopic images of common pigmented skin lesions. *ScientificData*, 5, 180161
- [3]. Han, S. S., Kim, M. S., Lim, W., et al. (2018). Classification of the clinical images for benign and malignant cutaneous tumors using a deep learning algorithm. *Journal of Investigative Dermatology*, 138(7), 1529–1538. <https://doi.org/10.1016/j.jid.2018.01.028>
- [4]. Brinker, T. J., Hekler, A., Enk, A. H., & von Kalle, C. (2018). Deep learning outperformed 136 of 157 dermatologists in a head-to-head dermoscopic melanoma image classification task. *European Journal of Cancer*, 113, 47–54. <https://doi.org/10.1016/j.ejca.2019.02.005>
- [5]. Kawahara, J., Daneshvar, S., Argenziano, G., et al. (2018). Seven-point checklist and skin lesion classification using multitask deep learning. *IEEE Journal of Biomedical and Health Informatics*, 23(2), 538–546. <https://doi.org/10.1109/JBHI.2018.2824327>
- [6]. Matek, C., Kather, J. N., et al. (2022). Deep learning for skin disease diagnosis: A review. *Computers in Biology and Medicine*, 148, 105810.
- [7]. Pham, T. C., Luong, C. M., Hoang, V. D., & Doucet, A. (2018). Skin lesion analysis towards melanoma detection