AI-based tool for preliminary diagnosis of Dermatological manifestations.

A PROJECT REPORT

Submitted by,

SI. No.	Roll No	Name
1	20211CSE0640	Anusha Shekar Gouda Malipatil
2	20211CSE0646	Sneha S Ballari
3	20211CSE0675	Thaksha Prabhakar
4	20211CSE0676	Sneha A

Under the guidance of,

Mr.Ramesh T
Assistant Professor
School of Computer Science and Engineering Presidency University

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

At

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

BENGALURU

MAY 2025

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report **"PSCS-67 - AI-based tool for preliminary diagnosis of Dermatological manifestations"** being submitted by **"ANUSHA MALIPATIL, SNEHA S BALLARI, THAKSHA PRABHAKAR, SNEHA A"** bearing roll number(s) **"20211CSE0640, 20211CSE0646, 20211CSE0675, 20211CSE0676"** in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a Bonafide work carried out under my supervision.

Mr.Ramesh T
Assistant Professor
School of CSE&IS Presidency University

Dr.Asif Mohammed H.B
HoD
School of CSE&IS
Presidency University

Dr. MYDHILI NAIR
Associate Dean
School of CSE
Presidency University

Dr. SAMEERUDDIN KHAN
Pro-Vc School of Engineering
Dean -School of CSE&IS
Presidency University

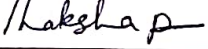
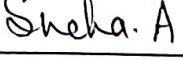
PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **"PSCS-67 - AI-based tool for preliminary diagnosis of Dermatological manifestations"** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering,** is a record of our own investigations carried under the guidance of **Mr.Ramesh T, Assistant Professor , School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

NAME	ROLL NO.	SIGNATURE
ANUSHA MALIPATIL	20211CSE0640	
SNEHA S BALLARI	20211CSE0646	
THAKSHA PRABHAKAR	20211CSE0675	
SNEHA A	20211CSE0676	

ABSTRACT

Skin disorders pose a significant global health challenge, necessitating precise and efficient diagnostic methods. This project presents an AI-based tool for the preliminary diagnosis of dermatological manifestations using deep learning and machine learning techniques. The system leverages pretrained convolutional neural networks (CNNs) such as VGG16, VGG19, InceptionV3, ResNet50, EfficientNetB0, and EfficientNetB3 for feature extraction and classification. The model is developed using TensorFlow and Keras, incorporating key image preprocessing techniques such as data augmentation, normalization, and scaling to enhance performance and generalizability.

The dataset is preprocessed using MinMaxScaler and power transformations to optimize feature representation. Additionally, a Random Forest Regressor is utilized for feature selection, ensuring the model prioritizes the most relevant dermatological patterns. Images are processed using OpenCV and PIL (Pillow), with transformations applied using Torchvision to improve robustness. The dataset is then split using train-test split, ensuring effective model evaluation.

To enhance learning efficiency, the Adam optimizer is employed along with Batch Normalization, Dropout, and Global Average Pooling to prevent overfitting and improve training stability. The training pipeline is configured with early stopping and model checkpointing, ensuring optimal convergence and preventing unnecessary computations. Evaluation metrics such as confusion matrices, accuracy scores, and performance visualizations using Matplotlib and Seaborn are used to analyze the model's effectiveness.

This AI-based diagnostic tool is designed to assist in the early detection of dermatological diseases, offering a fast and accessible approach to preliminary screening. By integrating deep learning-based feature extraction with machine learning-based refinement, the system provides a reliable, automated solution for dermatological assessment, potentially reducing the burden on healthcare professionals and improving patient outcomes.