DermalScan:AI_Facial Skin Aging Detection App

INFOSYS SPRINGBOARD VIRTUAL INTERNSHIP 6.0

BATCH - 9

Submitted by:

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Milestone 1: Dataset Preparation and Preprocessing –

(MODULE 1)

➢ INTRODUCTION –

- Facial skin aging is one of the most common concerns related to personal health and appearance. With the growing advancements in artificial intelligence, deep learning has become a powerful solution to analyze facial features and detect aging signs more accurately than traditional manual observation.
  The goal of this project — DermalScan — is to build an AI-based system that can identify different signs of facial aging such as wrinkles, dark spots, puffy eyes, and clear skin. The application uses a pre-trained EfficientNetB0 model along with face detection techniques, preprocessing, and a prediction pipeline to provide results that are reliable, fast, and user-friendly.
- This project is not just for automated predictions; it also focuses on creating an interface where users can upload their photos and receive annotated visual results with predicted percentages. In brief, DermalScan aims to assist in skin analysis using artificial intelligence in an accessible and practical way.

➢ PROJECT OBJECTIVE –

The main objective of DermalScan is:

- To detect facial features that indicate different signs of aging and classify them into four categories: wrinkles, dark spots, puffy eyes, and clear skin.
- To provide visual outputs such as annotated images and prediction percentages that users can easily understand.
- To build a complete pipeline from dataset preparation to frontend deployment.

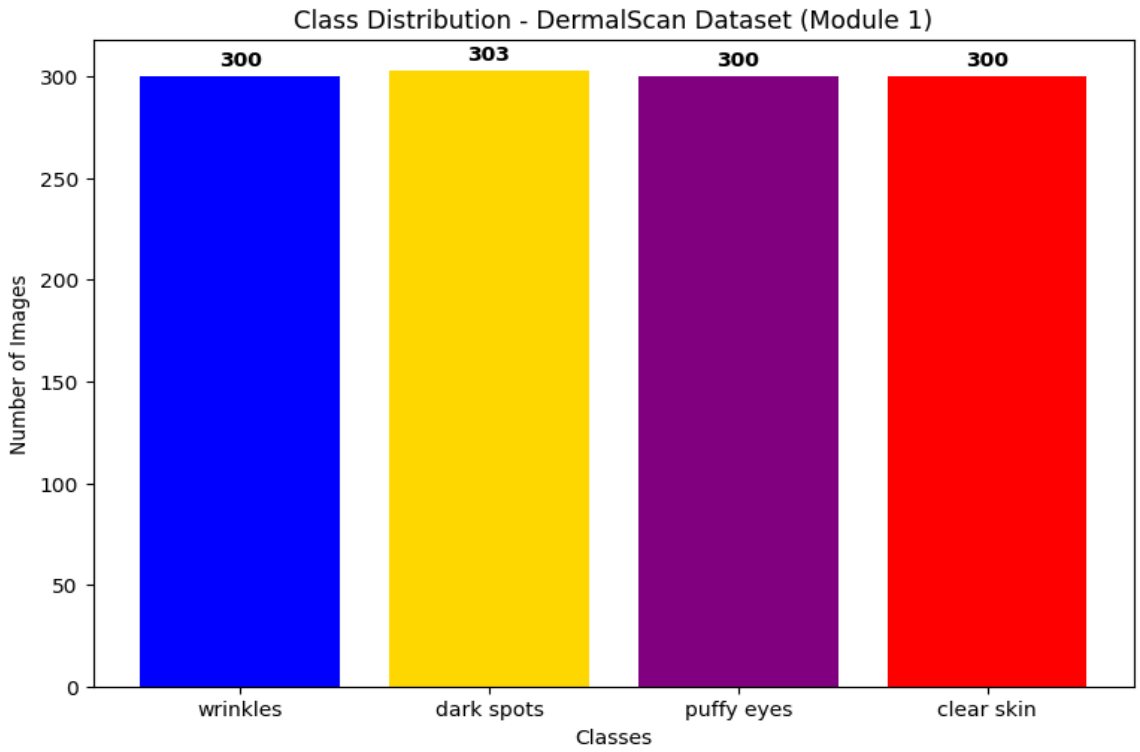
➢ Module 1 — Dataset Setup & Image Labelling –

Module 1 was focused on preparing the dataset and ensuring that the model has high-quality images for training. According to the project structure, this module includes:

- Collecting/setting up a dataset of facial images
- Categorizing them into four classes: wrinkles, dark spots, puffy eyes, clear skin
- Making sure each class has enough samples and the distribution is balanced

• Bar Graph — Class Distribution

A bar graph of the dataset was generated using the dataset inspection notebook to show the **number of images per class**. This visual output helped confirm that no class was significantly over- or under-represented.



➢ Final Output of Module 1

- Dataset fully sorted and labeled
- Class folders prepared for preprocessing
- Graph confirms balanced dataset
- Ready to proceed to Module 2

(MODULE 2)

INTRODUCTION -

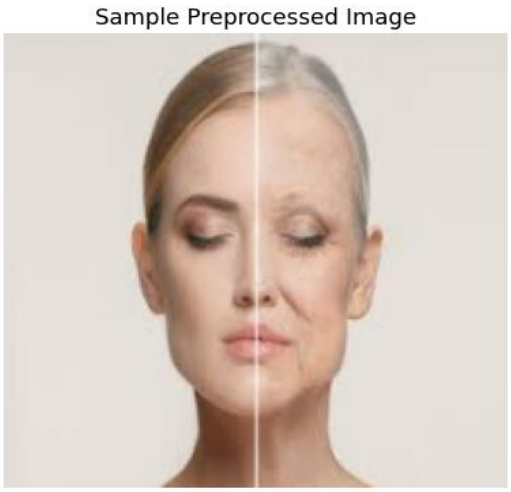
In this module, the dataset prepared in Module 1 is processed to make it suitable for deep learning. The main focus is resizing, normalization, augmentation, and label encoding.

➢ Objective -

- Prepare images for CNN input
- Increase dataset diversity using augmentation
- Convert labels into machine-readable format

➢ Preprocessing Steps -

- Images resized to 224×224
- Pixel values normalized to 0–1
- Images converted to NumPy arrays



➢ Data Augmentation -

To improve model generalization, basic augmentation techniques were applied:

- Horizontal flipping
- Rotation
- Zooming

➢ Label Encoding -

- Wrinkles → 0
- Dark Spots → 1
- Puffy Eyes → 2
- Clear Skin → 3
  Labels were later converted to one-hot encoded vectors.

➢ Output of Module 2 -

- Preprocessed image dataset
- Augmented samples for training
- One-hot encoded labels
- Dataset ready for CNN model training

➢ Conclusion -

- Module 2 successfully prepares the DermalScan dataset for deep learning by applying preprocessing and augmentation techniques, ensuring improved model performance in the next stage.