**Skin Disease Classification**

Project Abstract

**Abstract**

Skin disease classification plays a crucial role in early diagnosis and treatment planning. In this project, we present a web application for automated skin disease classification using deep learning techniques. The application is built using Streamlit, a Python library for creating interactive web apps, and TensorFlow/Keras for deep learning model development. The core of the application is a convolutional neural network (CNN) trained on a dataset of skin disease images. The trained model is capable of classifying images into nine different categories, including Actinic keratosis, Atopic Dermatitis, Benign keratosis, Dermatofibroma, Melanocytic nevus, Melanoma, Squamous cell carcinoma, Tinea Ringworm Candidiasis, and Vascular lesion. Users can upload an image of a skin lesion through the web interface, and the model predicts the most probable skin disease along with the confidence score. Additionally, the application provides insights into the model architecture through a summary display and visualizes training performance metrics such as accuracy and loss. This application serves as a valuable tool for healthcare professionals and individuals seeking preliminary assessment and guidance for skin conditions, potentially facilitating timely intervention and improving patient outcomes.

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**Introduction**

Skin diseases pose significant challenges in healthcare, often requiring timely and accurate diagnosis for effective treatment. Automated classification systems utilizing deep learning techniques have shown promise in assisting dermatologists with image-based diagnosis. In this project, we present a web application designed to facilitate skin disease classification using convolutional neural networks (CNNs). Leveraging Streamlit for the user interface and TensorFlow/Keras for model development, our application enables users to upload images of skin lesions and receive real-time predictions regarding the type of skin disease present. The aim of this project is to provide a user-friendly tool that aids both healthcare professionals and individuals in preliminary assessment, potentially improving diagnostic accuracy and patient care.

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**Implementation**

* Model Development: We trained a CNN model on a dataset comprising images of various skin diseases, including Actinic keratosis, Atopic Dermatitis, Benign keratosis, Dermatofibroma, Melanocytic nevus, Melanoma, Squamous cell carcinoma, Tinea Ringworm Candidiasis, and Vascular lesion. The model was developed using TensorFlow and Keras, employing techniques such as data augmentation, batch normalization, and dropout to enhance performance and generalization.
* Web Application Implementation: Using Streamlit, we created a user-friendly web interface for our skin disease classification system. The application allows users to upload images, perform real-time predictions, and visualize model performance metrics.
* Model Evaluation: We evaluated the performance of our trained model using standard evaluation metrics such as accuracy, precision, recall, and F1-score. Additionally, we visualized the model's predictions and provided insights into its decision-making process.

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