Skin Cancer Detection Using CNN(Django)

Skin cancer is among the most prevalent cancers globally, with early detection being crucial for effective treatment and enhanced survival rates. This study proposes an integrated approach to skin cancer detection using Convolutional Neural Networks (CNNs) within a Django web application. The dataset includes high-resolution images of both benign and malignant skin lesions. Leveraging CNNs for image classification, the system can automatically and accurately identify patterns in the images, aiding in distinguishing between various types of skin cancer, including melanoma, basal cell carcinoma, and squamous cell carcinoma.

The methodology begins with preprocessing the dataset to ensure consistency, followed by applying data augmentation techniques to bolster model robustness. The CNN architecture consists of multiple convolutional and pooling layers, culminating in fully connected layers that classify the skin lesion images. Training the model on this dataset yields high accuracy in identifying skin cancer types.

The Django framework forms the core of the web application, offering a user-friendly interface for uploading skin lesion images and receiving diagnostic results. The seamless integration of the trained CNN model with Django enables real-time predictions, making the system accessible and practical for clinical use. Key features of the web application include image upload, real-time prediction, and visualization of classification results, which enhance usability for both medical professionals and patients.

To evaluate the model's performance, metrics such as accuracy, precision, recall, and F1-score are employed. Results indicate that the CNN-based approach is highly effective, achieving a high level of accuracy in detecting malignant lesions. The system’s potential for clinical integration is discussed, highlighting its role in supporting dermatologists and alleviating the healthcare system's burden.

In conclusion, this study underscores the efficacy of CNNs in skin cancer detection and the importance of integrating advanced machine learning models into web applications for practical medical use. The proposed Django-based application not only offers a robust solution for early skin cancer detection but also sets the stage for further advancements in applying AI to healthcare. This approach signifies a step forward in harnessing technology to improve diagnostic accuracy and accessibility, ultimately aiming to reduce the mortality rate associated with skin cancer through timely and accurate detection.