Skin Cancer Detection Using CNN(Android)

Abstract

Skin cancer remains a pervasive global health concern, with early detection playing a pivotal role in improving patient outcomes and reducing mortality rates. In this study, we present a comprehensive approach to skin cancer detection utilizing Convolutional Neural Networks (CNNs) integrated within a Django web application, augmented by an Android app interface. The dataset utilized in this research comprises a diverse collection of high-resolution images encompassing both benign and malignant skin lesions, facilitating robust model training and validation.

The methodology employed in this study encompasses several key stages. Firstly, the dataset undergoes rigorous preprocessing techniques to ensure data consistency and enhance model performance. Subsequently, data augmentation strategies are applied to augment the dataset, thereby enhancing model robustness and generalization capabilities. The CNN architecture employed consists of multiple convolutional and pooling layers, followed by fully connected layers for accurate classification of skin lesion images. The trained CNN model is seamlessly integrated within the Django web application, enabling real-time predictions of skin cancer types.

Furthermore, to extend the accessibility and usability of the system, an Android app interface is developed, allowing users to interact with the skin cancer detection system conveniently from their mobile devices. The Android app facilitates image uploads for prediction, leveraging network communication to send image data to the Django server. Upon processing, the Django server returns the prediction results to the Android app, which are then presented to the user in an intuitive interface.

Key features of the web application and Android app interface include user-friendly image uploads, instantaneous prediction results, and visualization of classification outcomes. Performance evaluation of the proposed system is conducted using standard metrics such as accuracy, precision, recall, and F1-score. The results demonstrate the efficacy of the CNN-based approach in accurately detecting malignant skin lesions, thereby showcasing its potential for clinical integration and use.

This research contributes to the field of healthcare technology by providing a practical solution for early skin cancer detection. By leveraging advanced machine learning techniques and user-friendly interfaces, this approach aims to improve diagnostic accuracy and accessibility, ultimately leading to better patient outcomes and reduced mortality rates associated with skin cancer.

In conclusion, the integration of CNNs within a Django web application, complemented by an Android app interface, represents a significant advancement in utilizing technology for healthcare. This system holds promise for facilitating early detection of skin cancer, thereby contributing to the ongoing efforts to combat this prevalent disease and improve public health outcomes.