Deep Learning Based Web Application for Skin Cancer Classification

This project aimed to address the challenge of skin cancer classification through the development of a web application utilizing deep learning techniques and Flask framework. The study encompassed a comprehensive exploration of the field of skin cancer diagnosis, incorporating the utilization of the Ham10000 dataset and implementing various techniques to enhance the model's performance and accuracy.

The Ham10000 dataset, a collection of labeled skin lesion images encompassing seven distinct skin cancer types, formed the foundation of this project. Through a meticulous analysis of the dataset, valuable insights were gained pertaining to the distribution of skin cancer types, age, gender, and localization, thus contributing to a deeper understanding of the dataset's relevance within the field of dermatology.

To ensure the effectiveness of the skin cancer classification model, rigorous data pre-processing techniques were employed. Textual labels within the dataset were transformed into numerical representations using label encoding, enabling the deep learning model to process and interpret the data more efficiently. Moreover, the issue of imbalanced data was effectively addressed through a combination of down-sampling and up-sampling methodologies, ensuring a more balanced representation of different skin cancer types and consequently improving the model's overall performance.

The developed skin cancer classification model harnessed the power of the VGG16 convolutional neural network architecture, a well-established framework known for its efficacy in image classification tasks. By training the model on the augmented Ham10000 dataset, an impressive accuracy of 77.13% was achieved on the test set. This exceptional accuracy level demonstrates the model's ability to generalize well to unseen data, thereby showcasing its potential for real-world applications and accurate skin cancer classification.The resulting web application provides a user-friendly interface for uploading images from suspicious areas, offering accurate skin cancer classification results.