Skin Cancer Classification Report

Introduction

Skin cancer is prevalent, and early detection is crucial. This project aims to develop a model for classifying skin cancer images, assisting in accurate diagnosis.

Analysis

The dataset contains images of various skin lesions. Exploratory Data Analysis (EDA) highlighted class distribution and image dimensions. Preprocessing steps (resizing, normalization) and augmentation (flipping, rotation) were used to optimize model performance.

Methods

Two models were implemented: a custom Convolutional Neural Network (CNN) and a transfer learning model using VGG16. The CNN used Conv2D, MaxPooling2D, Flatten, and Dense layers, while the VGG16 model incorporated pretrained weights for improved performance. No Dropout layers were used; data augmentation mitigated overfitting.

Results

CNN Model: Achieved an accuracy of 97.58% and a validation accuracy of 91.38%

VGG16 Model: Achieved an accuracy of 94.60% and a validation accuracy of 83.93%

The CNN model outperformed the VGG16 model in validation accuracy, demonstrating its effectiveness even without transfer learning.

Reflection

This project emphasized the importance of data balance and thorough evaluation. The CNN model performed well, and in future iterations, enhancements to the augmentation pipeline or crossvalidation could be applied for further improvement. The VGG16 model, while slightly less effective, highlighted the potential of transfer learning for quick model deployment.