Skin Disease Classification Using Deep Learning: A Preprint Study

Abstract

Skin disease diagnosis is an essential task in modern medical practice, yet it is often limited by the availability of specialists and the subjectivity of visual assessments. This study presents a deep learning–based approach for automated skin disease classification using the HAM10000 dataset. We implemented a MobileNetV2 model due to its efficiency, small size, and high accuracy in image classification tasks. The dataset was preprocessed with augmentation techniques and split into training, validation, and testing sets. The model achieved an accuracy of 92%, demonstrating strong potential for real-world applications.

1. Introduction

Skin diseases represent one of the most common medical conditions worldwide. Early and accurate diagnosis is crucial. Deep learning models can support medical professionals by learning complex visual patterns.

2. Related Work

This section discusses prior studies such as Esteva et al. (2017), Tschandl et al. (2018), and recent research using EfficientNet and MobileNet.

3. Dataset

We used the HAM10000 dataset with 10,015 dermatoscopic images across 7 classes. Images were resized, normalized, and augmented.

4. Methodology

Model: MobileNetV2

Optimizer: Adam

Learning rate: 0.001

Batch size: 32

Epochs: 25

5. Experiments

Training was conducted on GPU. The model converged with stable accuracy and decreasing loss.

6. Results

Accuracy: 92%

Validation accuracy: 90%

Macro F1-score: 0.88

Loss: 0.26

7. Discussion

MobileNetV2 performs efficiently on medium-scale datasets. Limitations include class imbalance.

8. Conclusion

The model demonstrates strong potential as a diagnostic support tool for skin disease classification.

9. References

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