

# AN AI-BASED PRE-SCREENING SYSTEM FOR THE DIFFERENTIAL DIAGNOSIS OF HERPES SIMPLEX, SHINGLES, AND CHICKENPOX VIA MOBILE IMAGES

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## Abstract

Herpes Simplex, Shingles, and Chickenpox are common viral skin infections whose overlapping clinical presentations, characterized by vesicular rashes and localized inflammation, often make them difficult for the public to differentiate accurately. Early and precise diagnosis is paramount, as the timely administration of specific antiviral therapies significantly reduces the risk of long-term complications like postherpetic neuralgia or scarring. Currently, the diagnostic approach relies heavily on professional clinical examination and subjective visual assessment by healthcare providers. However, there remains a critical research gap regarding the efficacy of using smartphone-based imagery for the automated classification of these three distinct conditions. This study aims to address this gap by developing an AI-based system designed to detect and classify signs of Herpes Simplex, Shingles, and Chickenpox using images captured via mobile devices. Utilizing the Google Colab environment and Python, the methodology employed a train-validation-test framework to fine-tune a pre-trained VGG16 convolutional neural network. The dataset comprised 216 images for training, 47 for validation, and 55 for testing across the three categories. Following 50 epochs of training, the model achieved an overall accuracy of 76.36%, demonstrating particularly high precision in identifying Chickenpox and Herpes Simplex, though it frequently confused Shingles with Chickenpox. These results highlight the potential of AI as a pre-screening tool to reduce mundane diagnostic tasks in hospitals, though it is intended to augment rather than replace medical experts. Future research will focus on improving model accuracy through Grad-CAM visualization and embedding the system into Line Official accounts to enhance user accessibility.

**Keyword:** Deep Learning, Viral Skin Infections, VGG16, Smartphone Dermatology, Differential Diagnosis.