

Title: Enhancing Skin Disease Diagnosis Through Fine-Tune Convolutional Neural Network: A Comparative Study with Multi-class Approach

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Abstract: Due to their similar appearance, skin disorders frequently disguise their early warning signs from our skin, which is the defense system of the body. Preventing serious disorders requires their early detection. This work investigated the use of fine-tune transfer learning as a fast and accurate way to diagnose skin diseases. To classify different skin issues, we used pre-trained models, i.e., InceptionV3, DenseNet201, and Xception. This work examined 17,500 photos from three sources. It was found that fine-tune Xception performed exceptionally well, with an accuracy rate of 99.14%. It was closely followed by DenseNet201 and InceptionV3, each with different processing speeds, 98.74% and 98.46%, respectively. We used transfer learning with data sets validated by medical experts, outperforming earlier research in precision. This more accurate detection of skin diseases could greatly improve patient outcomes and expedite medical procedures. This approach is new in that it fine-tunes transfer learning by utilizing a vast number of data to increase accuracy compared to other researcher works.

Key words: fine-tune, imbalance data, medical imaging, skin disease, Xception

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