ABSTRACT

Skin cancer is one of the most common and dangerous types of cancer, which can be fatal if not detected early and treated promptly. Although doctors traditionally use dermoscopic images to detect skin cancer, the accuracy of this method is often inconsistent and highly dependent on the clinician's expertise. Therefore, this research aims to develop an early detection system for skin cancer using the *EfficientNet*V2 deep learning model and a hierarchical classification approach. This study utilizes the diverse HAM10000 dataset, implementing a tiered classification system from the most to the least frequent categories. The *EfficientNet*V2 model is employed to extract features from dermoscopic images, while hierarchical classification facilitates a more objective data grouping. In experiments conducted with three model structures—comprising 3 levels, 5 levels, and no hierarchy—it was found that the model with 5 hierarchical levels achieved the best results, with an accuracy of 93.20%. This research successfully created a system expected to assist doctors in detecting skin cancer more accurately, objectively, and efficiently. Thus, this system is expected to improve the accuracy of skin cancer diagnosis through more systematic and reliable use of dermoscopic images.

Keywords : Skin Cancer, Deep Learning, Hierarchical Classification, Dermoscopic Images