ID 816

Deep Learning for Early Skin Cancer Detection: A Convolutional Neural Network Approach

NDEA Perera[1#], SMM Lakmali[1], KC Yakupitiya[2], and BVKI Vidanage[3]

[1]Department of Computational Mathematics, Faculty of Computing, General Sir John Kotelawala Defence University, Sri Lanka

[2]Department of Information and Communication Technology, Faculty of Technology, University of Sri Jayewardenepura, Sri Lanka.

[3]Department of Computer Science, Faculty of Computing, General Sir John Kotelawala Defence University, Sri Lanka

[#]eumiperera@gmail.com

Skin cancer diagnosis often involves a lengthy waiting period for biopsy results, leaving patients in uncertainty and at risk. A patient with a suspicious lesion may wait one to three weeks for biopsy results, impacting their health and peace of mind. This study introduces a deep learning system using Convolutional Neural Networks (CNNs) to classify skin lesions as melanoma or non-melanoma. Trained on a dataset of approximately 44,000 images, the system achieves 86% accuracy, 76% precision, and 92% recall, aiming to automate preliminary diagnoses and reduce waiting times. The methodology included extensive data collection, preprocessing, model development, and training. Future work will focus on creating a user-friendly web application to improve accessibility for healthcare professionals and patients. Further research is needed to understand the model's performance across different data subgroups and to identify strategies for improvement. The proposed system supports dermatologists in early skin cancer detection and treatment, potentially transforming patient care. Its significant impact suggests it could become a valuable tool for both healthcare providers and patients.

Keywords: *skin cancer, deep learning, Convolutional Neural Networks*