INTISARI

Pengembangan model klasifikasi kanker kulit berbasis citra digital menggunakan arsitektur Convolutional Neural Network (CNN) memliki tujuan untuk mengatasi keterlambatan diagnosis kanker kulit menjadi tantangan serius, sehingga diperlukan sistem klasifikasi otomatis untuk menyederhanakan kompleksitas, memudahkan identifikasi, dan mendukung pengambilan keputusan yang tepat. Optimasi Synthetic Minority Over-sampling Technique (SMOTE) digunkaan untuk mengatasi ketidakseimbangan kelas pada dataset. Penelitian menggunakan dataset citra kulit dari Kaggle, mencakup lima kelas yaitu non-skin, melanoma, basal cell carcinoma, squamous cell carcinoma, dan kulit normal. Proses penelitian melibatkan tahapan preprocessing data, augmentasi, balancing menggunakan SMOTE, perancangan dan pelatihan model CNN, serta validasi performa model menggunakan metrik akurasi, precision, recall, F1-score, dan confusion matrix. Hasil pelatihan menunjukkan akurasi sebesar 99,47% pada data latih dan validasi menunjukkan akurasi 82,52%, yang mengindikasikan adanya indikasi overfitting namun tetap menunjukkan kinerja model yang cukup baik. Model yang dikembangkan juga telah berhasil diimplementasikan ke dalam aplikasi web.

Kata kunci: Kanker kulit, CNN, AI, Deep Learning, Augmentasi Data, Deteksi Otomatis, Citra Medis, SMOTE.

ABSTRACT

The development of a skin cancer classification model based on digital images using a Convolutional Neural Network (CNN) architecture aims to address the serious challenge of delayed skin cancer diagnosis, thereby necessitating an automated classification system to simplify complexity, facilitate identification, and support accurate decision-making. The Synthetic Minority Over-sampling Technique (SMOTE) optimization is used to address class imbalance in the dataset. The study utilized a skin image dataset from Kaggle, encompassing five classes: non-skin, melanoma, basal cell carcinoma, squamous cell carcinoma, and normal skin. The research process involved data preprocessing, augmentation, balancing using SMOTE, designing and training the CNN model, and validating model performance using accuracy, precision, recall, F1-score, and confusion matrix metrics. The training results showed an accuracy of 99.47% on the training data, while the validation data showed an accuracy of 82.52%, indicating signs of overfitting but still demonstrating satisfactory model performance. The developed model has also been successfully implemented into a web application.

Keywords: Skin cancer, CNN, AI, Deep Learning, Data Augmentation, Automatic Detection, Medical Image, SMOTE.