KLASIFIKASI TINGKAT KESEGARAN BUAH JERUK BERDASARKAN WARNA DAN TEKSTUR MENGGUNAKAN METODE CNN *Classification of Orange Freshness Level Based on Color and Texture Using the CNN Method*
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ABSTRACT

This study aims to develop a classification system for determining the freshness level of Sunkist oranges based on color and texture features using the Convolutional Neural Network (CNN) method. The system utilizes RGB color feature extraction and Gray Level Co-Occurrence Matrix (GLCM) texture analysis to distinguish between fresh and rotten oranges. The dataset comprises 950 orange images sourced from Kaggle, with 900 images for training (450 fresh and 450 rotten) and 50 images for testing. The image processing pipeline includes preprocessing, feature extraction, CNN model training, and the development of a mobile application using the Flutter framework. System testing was conducted using the blackbox testing method. The model training at 15 epochs achieved an accuracy of 97.72%, while testing on the test data yielded an accuracy of 96%, precision of 100%, and recall of 92.59%. The results demonstrate the effectiveness of the CNN method in classifying orange freshness, despite limitations in detecting images with complex backgrounds and limited dataset variety. This research is expected to help farmers and the general public classify the freshness of oranges quickly and accurately.

Keywords: *Orange Freshness Classification*, *Convolutional Neural Network* (CNN), *Framework Flutter*, *Mobile Application*