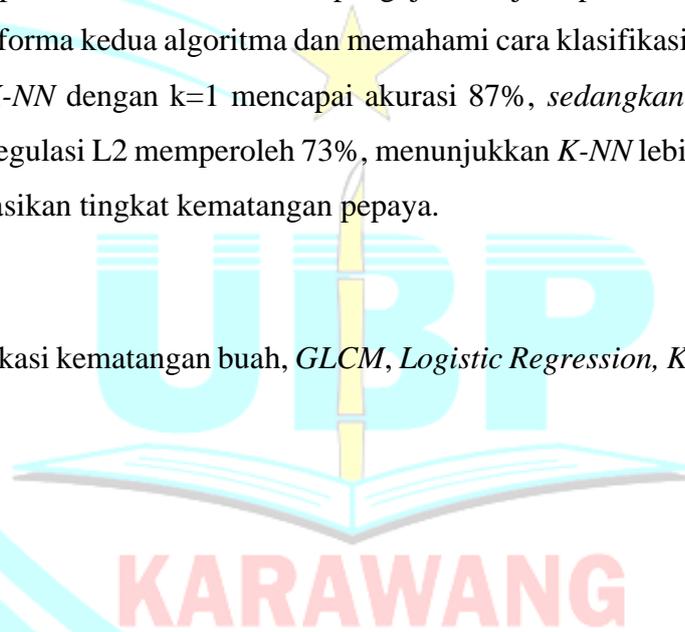


ABSTRAK

Penentuan kematangan buah pepaya secara visual sering kali tidak konsisten dan kurang akurat. Untuk mengatasi hal ini, penelitian menggunakan algoritma *Logistic Regression* dan *K-Nearest Neighbor (K-NN)* dalam klasifikasi otomatis berbasis pemrosesan citra digital. Dataset awal berisi 300 gambar yang kemudian diperbesar melalui preprocessing dan augmentasi menjadi 1.200 gambar. Fitur diekstraksi menggunakan *Gray Level Co-occurrence Matrix (GLCM)*, kemudian data dibagi menjadi 80% untuk pelatihan dan 20% untuk pengujian. Tujuan penelitian adalah membandingkan performa kedua algoritma dan memahami cara klasifikasi masing-masing. Hasilnya, *K-NN* dengan $k=1$ mencapai akurasi 87%, sedangkan *Logistic Regression* dengan regulasi L2 memperoleh 73%, menunjukkan *K-NN* lebih unggul dalam mengklasifikasikan tingkat kematangan pepaya.

Kata Kunci: Klasifikasi kematangan buah, *GLCM*, *Logistic Regression*, *K-Nearest Neighbor*.



ABSTRACT

Visual assessment of papaya ripeness often leads to inconsistent and low accuracy results. To address this, the study applies Logistic Regression and K-Nearest Neighbor (K-NN) algorithms for automatic classification using digital image processing. The initial dataset consisted of 300 images, which were expanded to 1,200 through preprocessing and augmentation. Features were extracted using the Gray Level Co-occurrence Matrix (GLCM) method, and the data was split into 80% for training and 20% for testing. The study aims to compare the performance of both algorithms and understand their classification mechanisms. Results show that K-NN with $k=1$ achieved an accuracy of 87%, while Logistic Regression with L2 regularization reached 73%, indicating that K-NN outperforms Logistic Regression in classifying papaya ripeness levels.

Keyword: *Fruit Ripeness Classification, GLCM, Logistic Regression, K-Nearest Neighbor.*

