ABSTRAK

Industri kopi merupakan salah satu sektor penting yang berkembang pesat, khususnya di Indonesia sebagai negara produsen utama. Permintaan akan kopi berkualitas tinggi mendorong perlunya sistem penilaian dan klasifikasi biji kopi yang lebih akurat. Penelitian ini mengembangkan sistem klasifikasi biji kopi hijau berbasis computer vision dan machine learning untuk meningkatkan akurasi dan efisiensi klasifikasi yang sebelumnya masih manual. Metode yang digunakan meliputi pengolahan citra digital dan ekstraksi fitur tekstur menggunakan *Gray level co-occurrence matrix* (GLCM), serta pengembangan model klasifikasi dengan kombinasi *Support Vector Machine* (SVM) dan *Adaboost*. Dataset terdiri dari gambar biji kopi Arabika, Robusta, dan Liberika. Evaluasi performa dilakukan dengan confusion matrix, cross-validation, serta pengukuran akurasi, *precision*, *recall*, dan *F1-score*. Hasil pengujian menunjukkan bahwa model *SVM-AdaBoost* yang dikembangkan berhasil mencapai akurasi 92,93% dalam mengidentifikasi jenis biji kopi hijau, dengan nilai *precision*, *recall*, dan *F1-score* pada seluruh kelas.

Kata kunci: Klasifikasi, Biji Kopi Hijau, *Computer Vision*, Ekstraksi Tekstur, *Glcm, SVM-AdaBoost*.

ABSTRACT

The coffee industry is one of the key sectors experiencing rapid growth, especially in Indonesia as a major producer. The increasing demand for high-quality coffee necessitates a more accurate system for the assessment and classification of coffee beans. This study develops an automatic classification system for green coffee beans based on computer vision and machine learning approaches to improve the accuracy and efficiency of classification, which has previously been performed manually. The proposed methodology involves digital image processing and texture feature extraction using the Gray level co-occurrence matrix (GLCM), as well as the development of a classification model combining the Support Vector Machine (SVM) and Adaboost algorithms. The dataset consists of images of Arabica, Robusta, and Liberica green coffee beans. Model performance was evaluated using a confusion matrix, cross-validation, and several metrics including accuracy, precision, recall, and F1-score. The experimental results demonstrate that the developed SVM-AdaBoost model achieves an accuracy of 92.93% in identifying the types of green coffee beans, with consistently high precision, recall, and F1-score values across all classes.

Keywords: *Classification, Green Coffee Bean, Computer Vision, Texture Feature Extraction, Glcm, SVM-AdaBoost*