

ABSTRAK

Penilaian kualitas buah apel sering menghadapi tantangan dalam hal konsistensi dan efisiensi, terutama ketika dilakukan dalam jumlah besar. Penelitian ini bertujuan untuk membangun sistem klasifikasi otomatis kualitas buah apel menggunakan algoritma *Support Vector Machine* (SVM), dengan mempertimbangkan karakteristik fisik dan organoleptik seperti ukuran, berat, tingkat kemanisan, kerenyahan, kadar air, kematangan, dan tingkat keasaman. Dataset yang digunakan diperoleh dari situs *Kaggle*, yang terdiri atas 4.000 entri data dan 9 fitur. Setelah melalui proses *preprocessing* dan pembagian data terdiri dari 80% untuk pelatihan dan 20% untuk pengujian, model SVM diimplementasikan dengan tiga jenis kernel: Linear, RBF, dan Polynomial. Hasil pengujian menunjukkan bahwa kernel RBF memberikan performa tertinggi dengan nilai akurasi, presisi, *recall*, dan *f1-score* sebesar 90%. Hal ini membuktikan bahwa metode SVM, khususnya dengan kernel RBF, mampu mengklasifikasikan kualitas buah apel secara lebih efektif dan akurat.

Kata Kunci: Buah Apel, Kernel, Klasifikasi, Machine Learning, Support Vector Machine

ABSTRACT

The assessment of apple quality often faces challenges in terms of consistency and efficiency, especially when carried out on a large scale. This study aims to develop an automatic classification system for apple quality using the Support Vector Machine (SVM) algorithm by considering physical and organoleptic characteristics such as size, weight, sweetness level, crispness, water content, ripeness, and acidity level. The dataset used was obtained from Kaggle, consisting of 4,000 data entries and 9 features. After undergoing preprocessing and data splitting—80% for training and 20% for testing—the SVM model was implemented using three types of kernels: Linear, RBF, and Polynomial. The test results showed that the RBF kernel achieved the highest performance, with accuracy, precision, recall, and F1-score values of 90%. This demonstrates that the SVM method, particularly with the RBF kernel, can classify apple quality more effectively and accurately.

Keyword: Apple Quality, Classification, Kernel, Machine Learning, Support Vector Machine