

ABSTRACT

The tea industry in Indonesia faces challenges in maintaining consistent product quality because the classification process is often done manually and subjectively. Reliance on experts leads to uncertainty and hinders production speed. To address this issue, this study developed a classification system for dry tea types such as Green Tea, Black Tea, and White Tea using Computer Vision methods. This system utilizes the Convolutional Neural Network (CNN) algorithm to classify tea types based on color features and the YOLOv8 model to detect and distinguish stem-leaf composition in tea images directly via a webcam. Testing was conducted across various scenarios, including model evaluation, confusion matrix analysis, and testing on single samples under different lighting conditions. The testing results showed that the developed CNN model achieved 98.2% accuracy in classifying the three types of tea. Additionally, the YOLOv8 model demonstrated good capability in distinguishing between leaves, stems, and other objects. This system provides an objective, fast, and consistent tea classification solution, thereby enhancing productivity and quality standards in the tea processing industry.

Keywords: Computer Vision, CNN, Object Detection, Tea Classification, YOLOv8