

ABSTRACT

Rice variety classification is a crucial aspect of maintaining product quality and standardization in the food industry. However, manual identification is often time-consuming and prone to human error. This research implements the YOLOv8 Nano deep learning algorithm (YOLOv8n-cls) to classify five rice varieties: Arborio, Basmati, Ipsala, Jasmine, and Karacadag. The focus of this study is to test the effectiveness of a lightweight model on a large dataset of 75,000 images using limited computational resources (CPU). The results show that the model achieved a stable convergence point with an accuracy of 99.86%. In-depth evaluation via a confusion matrix yielded average precision, recall, and f1-score values of 99.89%. These findings prove that the YOLOv8n-cls architecture is highly reliable and efficient for use in automated real-time rice classification systems, even when deployed on devices with mid-range hardware specifications.

Keywords : Rice Classification, YOLOv8, Deep Learning, Computer Vision, Lightweight Model