

ABSTRACT

OBJECT DETECTION SYSTEM FOR RICE VARIETY IDENTIFICATION USING YOLOV8 ALGORITHM

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Manual identification of rice varieties is often inconsistent due to limited visual knowledge and high inter-varietal similarity. This research aims to develop an object detection system based on the YOLOv8 algorithm that can automatically and in real-time identify different rice varieties. The system was trained using an image dataset consisting of seven rice types: black rice, IR42, sticky rice, red rice, basmati, buloq, and japonica. The training process produced a classification model with high accuracy on internal data. Evaluation was conducted using confusion matrix, black box, and white box testing. The confusion matrix results showed 99% accuracy on internal data, while accuracy on external (outsourced) data dropped to 82%. Black box testing confirmed that the system functioned as expected within the user interface. White box testing was performed by analyzing the program flow and decision-making process in the source code. The decrease in performance on external data was attributed to the lack of diversity in the training data, suggesting the need for data augmentation, additional images, or re-training. The developed system demonstrates promising potential as an efficient solution for rice variety classification to support digitalization in the agricultural sector.

Keywords: object detection; YOLOv8; computer vision; deep learning; agriculture technology