ABSTRACT

Muhammad Zamzam Fauzan, 10121683

DEVELOPMENT OF A WEB-BASED APPLICATION FOR CASSAVA LEAF DISEASE DETECTION UTILIZING THE YOLOV11 ALGORITHM

Cassava leaf diseases pose a significant threat to cassava production, causing substantial losses for farmers. This research aims to develop an automated cassava leaf disease detection system using the YOLOv11 algorithm. The detected diseases include Cassava Bacterial Blight (CBB), Cassava Green Mite (CGM), Cassava Mosaic Disease (CMD), and Cassava Brown Streak Disease (CBSD), along with healthy leaves. The dataset consists of 4,184 images obtained from Roboflow. The model was latihed for 50 *epoch* and demonstrated excellent performance with a Precision 0.917, Recall 0.914, mAP50 0.963, dan mAP50-95 0.873. Specifically, the mAP50 values for each class were: CBB 0.921, CGM 0.969, CMD 0.961, CBSD 0.985 and healthy leaves 0.979. A web-based application was developed using the Streamlit framework. The system was comprehensively tested using four methods: ground truth data trials, robustness testing with distance variations of 5 cm, 10 cm, 25 cm, and 35 cm, black-box testing with 11 scenarios, and a user acceptance test (UAT) involving 50 respondents. The test results show that the system accurately detects diseases under various conditions and functions optimally as expected. Furthermore, the result of UAT indicates a high level of user satisfaction with an average score of 4.27 out of 5. This research proves that the YOLOv11 algorithm is effective for detecting cassava leaf diseases and can be implemented as a practical solution to assist farmers.