ABSTRACT

Horticulture is an important branch of agriculture in meeting food and aesthetic needs. Proper monitoring of plants is essential to maintain their health and productivity. However, knowledge about how horticultural plants are perceived and valued is still very limited in urban communities.

In previous studies, horticultural plant datasets to distinguish plant types had the weakness that there was no accurate plant classification dataset. Ordinary urban communities often have difficulty distinguishing types of horticultural plants, which results in inappropriate care and decreased yields.

In this study, to answer the problems found in urban communities, researchers developed a more accurate deep learning-based horticultural plant classification system. The aim is to collect horticultural plant datasets which are then used for classification in the Smart GreenBox system based on deep learning. The data collection process is carried out by taking samples from various types of horticultural plants, including visual and growth characteristics. The data collected includes images, environmental parameters, and plant growth conditions. Furthermore, the data is processed and processed to produce a dataset that can be used in training deep learning-based classification models.

To ensure that the use of deep learning produces an accurate and efficient classification with and without data augmentation, using the Scratch model and the VGG16 model. Testing will focus on the following aspects, namely Model Accuracy Evaluation, Cross-Validation Testing, and Dataset Performance Analysis.

From the measurement results, it was found that the results showed that the VGG16 model with data augmentation achieved an accuracy of 0.9057, while without augmentation it reached 0.83019. This shows that the dataset used is quite representative and effective in supporting the classification task.

Keywords: *Horticulture, Crop classification, deep learning, SMART GREENBOX, Crop dataset, Data augmentation, VGG16 model, Crop monitoring, Smart agriculture.*