Abstract

Pests pose a significant threat to strawberry production, making early detection crucial for effective control. This thesis aims to implement Convolutional Neural Networks (CNN) in pest detection in strawberry plants. This method involves selecting CNN models such as AlexNet, DenseNet121, and ResNet50 to evaluate their effectiveness in identifying pests in strawberry plants. The model development process involves installing software such as Keras for training and testing the models.

The testing metrics applied include accuracy, precision, recall, and F1-score to evaluate the performance of CNN models in identifying pests in strawberry plants. This testing involves scenarios such as convolution and pooling to validate the extraction of relevant features from strawberry plant images.

The model is built by starting from the collected data, then preprocessing through segmentation and augmentation. The processed data is then divided with a ratio of 80% for training data and 20% for testing data. The models developed include AlexNet, DenseNet, and ResNet. In this thesis, the KFold method is applied to assess the performance of the model more accurately. This process involves dividing the dataset into several equal segments (folds), where the model is trained and tested alternately on each fold.

Comparison of the research results with similar studies shows that the implemented CNN model has successfully achieved promising accuracy in identifying diseases in strawberry plants. The results of testing and analysis provide important insights into the effectiveness of the CNN model in detecting pests in strawberry plants.

Keywords: Internet of Things (IoT), Convolutional Neural Network (CNN), Detection, Pests, Strawberry.