ABSTRACT

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CLASSIFICATION OF CATERPILLAR PESTS IN MUSTARD LEAF IMAGES WITH XCEPTION ARCHITECTURE BASED ON CONVOLUTIONAL NEURAL NETWORK
Thesis. Informatics, Faculty of Industrial Technology. Gunadarma University, 2023.
Keyword : Mustard Plant, Detection, Convolutional Neural Network, Xception
(XI+65+Attachment)

Mustard greens are a group of plants from the Brassica clan whose leaves or flowers are used as food (vegetables), both fresh and processed. Mustard greens include several Brassica species that are sometimes similar to each other. In Indonesia, the mention of mustard greens usually refers to mustard greens (Brassica rapa parachinensis group, which is also called mustard meatballs, caisim, or caisin). Mustard greens contain many nutrients such as vitamin A, vitamin C, vitamin K, calcium, magnesium, and potassium. Mustard greens can also provide many benefits for human health, such as increasing endurance, maintaining bone health, and preventing several types of disease. In cultivating vegetable crops, you will not be separated from diseases and pest threats that often attack. Pests that attack these plants cause crop failure and decreased production of vegetable crops. The main pests and diseases in mustard plants are caterpillars. Deep learning is used which can learn patterns and knowledge from the data provided and then used for predictions or decision making. This study aims to classify caterpillar pests on the image of mustard leaf plants with the Xception architectural model based on the Convolutional Neural Network with the Xception architecture. The research phase involved collecting a mustard leaf dataset that focused on 500 images of healthy mustard leaves and 500 images of mustard leaves with caterpillars. The data was then divided into two categories: the positive class for mustard leaves had caterpillars, and the negative class for mustard leaves had no caterpillars. The next stage is preprocessing and the Convolutional Neural Network method with the xception architecture to focus on studying leaf image patterns in the classification of mustard leaf images that contain caterpillars and mustard leaf images that do not contain caterpillars. The results of the classification with the Xception architecture model with trials on training data with 600 training data, 200 test data and 200 validation data produce the highest accuracy of 96%, a sensitivity value of 96% and a specificity value of 97%.

Bibliography (2018-2023)