

ABSTRACT

This research takes the title "Raspberry Pi-based digital phenotyping - detection and counting system for fruits and flower in tomato". The formulation of the problem in this research is the obstacles experienced by farmers in Indonesia in knowing the development of tomato plants. Based on this problem formulation, this research aims to create a detection system and resolve the obstacles experienced by farmers in knowing the development of tomato plants. To work on this research system, use a Raspberry Pi or mini PC to carry out the task. The first process is taking photos of tomato plants to create a model for detecting fruit and flowers on the plant. Based on the photo data that has been taken, the most suitable method to use is the method SSD-MobileNet-V2 specifically designed for mobile devices and applications that require lighter models such as the Raspberry Pi. This photo data training use open-source Google-colab which is a product from Google for executing python code via browser, Researchers found a free code where this system will create a learning machine that will make the object recognition process easier. After the image is tagged using a special application, namely labeling, the image is then transferred to Google-colab to be trained and create a model for detecting the object using the SSD-MobileNet-V2 method. After the model is obtained, the detection model is transferred to the Raspberry Pi to test the system model using library opencv and tensorflow lite to make it easier to read the detection results that have been made and add code for the calculation system. The detection model created will display the results of detection and calculation of tomato plants on the Raspberry Pi that is used LCD waveshare, Meanwhile, to capture images and videos, researchers use a camera webcam which is easy to carry.

Keywords: Detection system, tomato plants, Raspberry Pi, SSD-MobileNet-V2, python, *Lcd waveshare*, Google-colab, opencv, tensorflow-lite.