

ABSTRACT

The development of technology now makes it possible to create a good level of fruit maturity detection system that helps to sort the tomato fruit with the right level of maturity to be harvested. This system is intended to operate wirelessly by connecting the Single-Board Computer that is attached to the camera as an image processing with an interface. In this final task, you have to make a maturity detection system in tomato fruit using Raspberry PI with grid color method and K-NN method in RGB and YCbCr color space to detect the maturity level of tomato fruit, outside and indoors conditions.

Some research on the detection of the maturity level of the tomato registered is done, but there has not been any research that implements the maturity detection system of tomato fruit that can be implemented by sunlight. Starting from image acquisition with a camera integrated with Raspberry Pi. the taken image through a pre-processing stage which will be extracted by using the grid color method. The extracted Data classified using K-NN to determine the maturity level of tomato fruit through Matlab software.

This final task carried out several stages of system testing, obtained average result the system accuracy of 88.14%. Obtained the ideal parameters for the system using RGB-YCbCr color space with the classification of K-NN distance Correlation and value $K = 7$. When it is ideal to perform the detection of the maturity level of tomatoes is the morning at 9 o'clock and afternoon at 15 o'clock with the average system in computing the 0.79 seconds. Where the detection process is fast enough.

Keywords: *Tomato, Color Grid, K-NN, YCbCr. Raspberry Pi.*