

## **ABSTRACT**

*In Indonesia, the fruit industry is currently far behind other countries. Some fruit farmers in the process of observing the maturity of the fruit that is ready to pick are still using the manual method, only doing visual observations of humans directly or by pressing the texture of the fruit. By doing the classification the level of guava maturity manually it greatly prolongs the work process, is less precise and inconsistent.*

*In this Final Project a software-based system will be made that can determine the level of guava fruit maturity based on textures and colors in digital images. This system is made using a camera as a medium to acquire images. The image that has been acquired is then used as a training image and testing image. Determining the reference image through the process of changing the image to grayscale which will be extracted further using the Gray Level Co-occurrence Matrix (GLCM) method, and the process of recognizing will be divided into several classes with the K-Nearest Neighbor (K-NN method). So that it will get results from the classification of types of guava (guava and crystal guava), size (large, small, and medium), maturity (ripe, half-cooked, and raw).*

*The results of tests carried out consisted of 18 classes in which each class contained 90 images, bringing the total data used to 1620 images. In this study using 50: 50 data with 45 training data images in each class, and 45 test data images in each class. The results obtained the best achievement level of 82.09% with GLCM parameters using the Energy, Correlation and Homogeneity features with a quantization level of 8, at an angle reached 45 ° and a distance of 4 pixels. Whereas the K-Nearest Neighbor (K-NN) parameter uses euclidean distance and  $k=1$ .*

**Keywords:** *Guava, Gray Level Co-occurrence Matrix (GLCM), K-Nearest Neighbor (K-NN)*