ABSTRACT

The use of human power in the sorting process on industrial goods are still widely used today. Every human being has a different view of the sorting type and quality of the goods. Various techniques are used in the sorting of goods, one of which uses digital image processing. Digital image processing can help eliminate noise in the data retrieval input of image pixel values. Backpropagation artificial neural network algorithm is an algorithm that mimics the human nervous system works. These algorithms can be used in solving complex problems. Data input is an image used consisted of many pixel values, so the algorithm is suitable to solve the problems in this thesis.

At the end of the book task, the system will be designed using back propagation neural network algorithm. Webcams are used as the senses of sight, which serves capture images of objects. Then do the image processing to remove noise. The pixel values of the image processing results will be taken and used as input data. Backpropagation artificial neural network algorithm has two phases: training phase and testing phase. At this stage of training will produce a new weight value of each form that was subsequently used in the testing phase to determine the shape of the object. Image processing and neural network is done in a micro controller Raspberry Pi using Python language.

The program can perform data storage into the database. Backpropagation artificial neural network algorithm can determine the type of shapes. The system works well and can determine the shape of objects with a performance of 87.5%. The amount of the performance is influenced by light intensity and quality of the webcam.

Keyword: *pattern recognition*, *image processing*, *neural network*, Raspberry Pi