

## ***ABSTRACT***

All the technology works automatically to assist and facilitate the work of humans in any case. In addition, crime rates are higher theft security system is needed to reduce such crime. Case in criminality in the work space. In this final project created a tool, in which system the door will open and close automatically based on the characteristics of the user's face. This tool using Artificial Neural Network (ANN) Backpropagation. With this method, the information obtained from the WebCam on a testing program processed by the Raspberry Pi 2 Model B, a small computer and compared to a database that is the result of the process of learning programs. The results of image processing will be input to the Motor Servo, if appropriate, the doors will open and close again automatically, but on the contrary if it does not match then the door would not open.

Testing tool is done by looking at the accuracy of detection equipment to the object, the detection accuracy of the face attribute, the performance of the tool to the object with the light factor, response time tools and tool performance against objects that are not available in the learning program. Each test is carried out 25 times.

The results obtained from testing the tool to see the response on 5 objects they could have done the learning process, the tool can recognize objects well with the level of accuracy of 92%, 88%, 88%, 92% and 88%. Against the facial attributes such as glasses, the object can not be identified with precision and accuracy rate of 40%. In a place that has a light intensity of 317 lux objects can be identified with an accuracy of 92%, but with the conditions of an intensity of 1507 lux object can not be identified with precision, and only has an accuracy rate of 20%, then the factor of light intensity affects the performance tool , The response time is 8 seconds the learning process, the testing process gained time by 7 seconds. The experimental results of the object is not available in the database obtained PFA was 12%. This shows that the tools can work well.

**Keywords:** Neural Network Backpropagation, Raspberry Pi 2 Model B, a motor servo.