ABSTRACT

Indonesia is one of the countries that have the densest population in the world. The growing of population increases every year and generally occur in large cities. Along with the increasing number of people in Indonesia, it also increased the public demand for vehicles. The increasing number of vehicles is not accompanied by increasing highway facilities, so the congestion can not be avoided any longer. The government has doing various efforts to overcome the congestion, one of which is to build a highway that we used to know the toll road.

The toll road is a state facility designed to reduce the level of vehicle density on the normal channels. The toll road is generally only be passed by a certain type of vehicle. The class of vehicles that are discussed in this thesis is group I, group II and group III.

To identify the type of vehicle, carried out the basic shape recognition using image processing analysis of feature extraction with the method of Edge Detection, and each of the model will serve as a reference. The process of classification used method of artificial neural networks Learning Vector Quantization (LVQ) and Self Organizing Maps (SOM). Then these two methods compare the level of accuracy.

The result of the implementation is tested several times with the image of testing, through implementation and testing of the system can give a fairly good level of accuracy. In testing the accuracy obtained from Learn Vector Quantification (LVQ) by 86,67%, while the Self Organizing Maps (SOM) of 90%. This suggests that SOM is more accurate than LVQ.

Keywords: *Artificial Neural Network, LVQ, SOM, Edge Detection*