

## Abstract

In this final project, it's made a systems which is combined Principal Component Analysis (PCA) as a method for extracting features and Learning Vector Quantization (LVQ) Neural Network as a method to classify vehicles which entering the highway. Type of vehicle is that will be classified are class I, II and III. Vehicle types included class I, ie: sedan, mini sedan, minibus, pick up, bus and small truck. Vehicle class II, ie: two-axle truck and class II,ie three-axle truck. By using this method, the systems can recognize 80 testing data with accuracy of 85% and training data with accuracy of 90%.

PCA method has ability ro reduce the dimensions of the data that still maintaining the characteristics and information data. Meanwhile, LVQ Neural Network is a network with a supervised learning. The advantages of LVQ is has a linear layer, so it has a fast learning ability. Feature extraction with PCA using 120 images data. Training process using 120 training data and whereas testing process using 80 testing data. From the result of the final project, the best parameters of PCA and LVQ are 150 PCs, 2000 epoch, learning rate 0.0075 and 32 hidden neurons.

**Keyword:** vehicles classification, feature extraction, Principal Component Analysis (PCA), learning, Learning Vector Quantization (LVQ)