

## ABSTRACT

Congestion is something that cannot be avoided in everyday life for everyone. Especially for people who live in big cities with high population and mobilization rates like the city of Bandung. Certainly, it triggers the density of vehicles which can cause congestion. Public transportation in the city of Bandung is considered to be able to reduce the level of congestion but cannot be used as an option to travel without experiencing congestion. Considering that public transportation such as Trans Metro Bandung itself does not have its own special line to operate.

A monitoring system to monitor traffic conditions in the city of Bandung, especially on the Trans Metro Bandung bus fleet line can be a solution in taking quick action by the authorities when there is a possibility of congestion. In addition, prospective passengers can also find out the traffic conditions along the lines passed by Trans Metro Bandung buses at certain hours and days.

In this final project research aims to create a congestion monitoring system by utilizing the speed of the Trans Metro Bandung bus when it is operating to serve as an indication of congestion. Bus speed is obtained from GPS with Raspberry Pi 3B as a Microcomputer that has been installed on the bus and processed into a machine learning model to classify congestion based on historical data from GPS. The Machine Learning models used are Decision Tree and Random Forest. Testing the prediction results on each model is carried out using a confusion matrix by measuring the Precision, Recall, F1-Score, and Accuracy parameters. Determination of the Max Depth value based on train data and test data is also carried out to get the best performance and see whether the model is overfitting, underfitting or not. The Decision Tree is obtained as the model with the best performance with an Accuracy value of 96.8% in split data of 80% train data and 20% test data.

**Keywords:** Bus Rapid Transit, Internet of Things, Machine Learning, Decision Tree, Random Forest, Trans Metro Bandung.