ABSTRACT

Air is the element that all living things all over the world need. The air that we need is not necessarily used as it should be, including being exposed to pollution of substances that damage the air element itself. These substances result from the lifestyle of humans who are not aware of the dangers such as industry, motor vehicles and even smoking.

Prediction is defined as a tactic in which past data is fed into a model and the outcome of the model is a forecast. Predictions were made in this study using long short-term memory using air pollution standard index (APSI) data obtained from the Jakarta Open Data web portal distributed by the Jakarta Environment Agency with 5 predicted substance parameters. With the prediction of APSI makes the public can know and anticipate early air pollution.

The use of the long short-term memory method because the method produces excellent number predictions for time series data. Predictions that have been made and then implemented into the web using the Flask framework. The study used 5 substance parameters contained in APSI so as to get different test results in each substance parameter. The results of data partition testing of each substance are PM_{10} 80% training data 20% test data, SO_2 50% training data 50% test data, CO 80% training data 20% test data, O_3 80% training data 20% test data, and NO_2 50% training data 50% test data. From the results of data partition testing found the best modeling of PM_{10} with epoch = 100, hidden layer = 1, neuron = 128, optimizer = Rmsprop, RMSE of 0.007237, SO_2 with epoch = 50, hidden layer = 1, neuron = 64, optimizer = Adamax, RMSE of 0.05841, CO with epoch = 100, hidden layer = 1, neuron = 64, optimizer = Adamax, RMSE of 0.05474, O_3 with epoch = 50, hidden layer = 1, neuron = 64, optimizer = Adam, RMSE of 0.04465, and NO_2 with epoch = 50, hidden layer = 1, neuron = 64, optimizer = Adam, RMSE of 0.0431. Based on usability testing that has been done, the website designed can help in predicting APSI with a percentage of usability testing questionnaire value 80.7%.

Keywords: *air, APSI, Jakarta, long short-term memory, website*