

Universiti Teknologi MARA

**Air Pollution Forecasting in Kuala
Terengganu using Artificial Neural
Network (ANN)**

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ABSTRACT

Nowadays, air pollution is a very serious problem faced by every country due to the increase in the number of vehicles, development of industrialization and other human activities. In Malaysia, the existing websites or applications for API reading are mostly owned by foreign countries. Moreover, according to APIMS website, DOE are still unable to forecast the API and currently working with other countries on this issue. Existing researches on air pollution forecasting used a variety of machine learning algorithm. One of the popular algorithms used to forecast the air pollution is Artificial Neural Network (ANN). In this study, ANN algorithm is used to forecast air pollution index (API) for the next day in Kuala Terengganu. This study focused on the prediction of API based on 5 years daily concentration of main pollutants and API that was taken from the air quality monitoring station in Kuala Terengganu. The aim of this study is to develop an artificial neural network system model that can predict air pollution in Kuala Terengganu. The Multilayer Perceptron Neural Network (MLP) engine is implemented in the system prototype by using Python language in Eclipse IDE. The performance of the model is evaluated by using statistical method which is Mean Squared Error (MSE) and functionality test is performed to make sure the system prototype is working correctly. The implementation of ANN which is Multilayer Perceptron for prediction of air pollution in Kuala Terengganu gives a good accuracy which is 77%. In order to get a good performance model, a hyperparameter tuning process is carried out and best hyperparameters values are selected. The performance of the model in making prediction is good as the MSE value is closer to zero which is 0.0195 when the model is evaluated with test dataset. Therefore, a satisfactory result can be obtained when using this system prototype to predict the air pollution in Kuala Terengganu. However, the performance of the model can be improved by using more data during the training process. Deep learning technique can also be used for more accurate prediction model.

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