ABSTRACT

PREDICTION OF AIR POLLUTION LEVEL DUE TO MOTOR VEHICLES USING FUZZY TIME SERIES CHENG METHOD (CASE STUDY OF YOGYAKARTA CITY)

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Air pollution is defined as the entry of substances, energy, from other components into the environmental air through human activities, so that air quality decreases to a certain level and causes environmental air to be unable to fulfill its function. Various activities carried out such as industrial activities, transportation, and other activities have a significant role in encouraging air pollution. In the field of transportation, transportation activities increase in line with the human need to move from place to place in carrying out their activities, this progress is seen by the increasing number of existing vehicles and continues to grow from year to year, including in the Special Region of Yogyakarta which is one of the tourist destinations, both local and international. foreign countries, with a record of tourist visits to the city of Yogyakarta The increasing number of vehicles can lead to congestion, which has a negative impact in the form of air pollution. Pollutants released by motorized vehicles are carbon monoxide (CO), nitrogen oxides (NOx), hydrocarbons (HC), sulfur dioxide (SO2), lead (Pb) and carbon dioxide (CO2). Carbon monoxide (CO) is one of the most common pollutants produced by motor vehicles, CO pollutants emitted by motorized vehicles have a negative impact on human health. Carbon monoxide is a highly toxic gaseous pollutant. This compound binds to hemoglobin (Hb) which functions to deliver fresh oxygen throughout the body, causing the function of Hb to carry oxygen throughout the body to be disrupted. The reduced supply of oxygen throughout the body will make shortness of breath and even the worst impact can cause death based on the problems described as a reference in predicting the amount of pollutant concentration produced by motor vehicles, especially carbon monoxide using Fuzzy Time Series Cheng which will be displayed in a website-based application. The study was conducted using CO data every 30 minutes in December 2021 with a total of 1488 data obtained from the Yogyakarta City Environment Service, with the results of the accuracy of the test using the Mean absolute percentage error (MAPE) getting an inaccuracy value of 4.89% which shows the fuzzy Time series cheng is very good at predicting carbon monoxide in the air.

Keywords: Air Pollution, Carbon Monoxide, Fuzzy Time Series Cheng Forecasting, Vehicle