ABSTRACT

With the rapid development of technology, sometimes individuals forget about their health, plus during the pandemic, the air quality in a room becomes more of a concern. Maintaining air quality to be healthy and good for humans to breathe is by keeping the amount of pollutants in the air, such as Carbon Dioxide (CO_2), Volatile Organic Compound (VOC), and Formaldehyde (HCHO), at a predetermined and agreed threshold is important. So in this research, we propose an on-board air quality index detection system for indoor and can forecast the air quality in the future. The system will use a Raspberry Pi 4 microcontroller for data acquisition and a WP6003 sensor device that will capture parameters for the air quality index. The system will run for 31 days to capture parameter data every 30 seconds. The parameter data is then analyzed using a correlation matrix to determine the parameters that affect each other. Then classified using fuzzy logic to determine the quality index based on the value of each parameter. The air quality index obtained is then forecast using the ARIMA and LSTM methods for the next 30 minutes. Then the forecasting accuracy is calculated using the RMSE and MAPE metrics. The correlation matrix results show that Carbon Dioxide (CO_2), Volatile Organic Compound (VOC), and Formaldehyde (HCHO) are related. Comparison of the forecasting results of the two methods concluded that the LSTM method outperformed ARIMA to forecast the air quality index for the next 30 minutes based on the previous 10 hours of data.