

A Nonlinear IAQ Model for Ventilation Control in Subway Stations Using Adaptive Fuzzy Neural Network Model

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The aim of this study is to propose a nonlinear prediction model for the ventilation control of indoor air quality (IAQ) in subway stations. The adaptive neuro-fuzzy inference system (ANFIS) method is adopted to capture the nonlinear characteristics of the indoor air pollutants and the ventilation rates. The real IAQ data collected from a subway station in Seoul were used to analyze and demonstrate the ANFIS modeling efficiency. Three performance indices including root mean square error (RMSE), mean absolute percentage error (MAPE), and correlation coefficient (R) were used to test model accuracy. For both of the training and validation data, RMSE, MAPE, and R values of the proposed nonlinear model shows greatly improved prediction results, compared to the conventional linear models. Acknowledgement) This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MEST) (No. 2012-0000609) and the Korea Research Foundation Grant funded by the Korean Government (KRF-2012-001400).