

Using of Artificial Neural Networks in Prediction of SO₂, NO and NO₂ Concentrations in Gliwice, Poland – Wioletta Rogula, Jacek Żeliński

Summary

The paper presents application of measurements of pollutant concentrations and meteorological conditions to create neural networks able to predict the pollutant concentrations on the basis of meteorological conditions. The measured quantities comprised 30-min concentrations of SO₂, NO, NO₂ and meteorological parameters, such as direction and speed of wind, air temperature, solar radiation, air humidity, and Pasquill stability class of atmosphere. The data were developed with the use of the StatSoft's Statistica Neural Networks computer program. The Levenberg – Marquardt algorithm was used to train networks. About 600 networks were created, trained and tested for each of SO₂, NO and NO₂ to predict their concentrations in ambient air and from among them the best performing network was selected. The chosen networks were used to compute concentrations on the basis of meteorological parameters. The neural models were run subsequently for SO₂, NO and NO₂. Measured and computed concentrations of the pollutants were presented in charts, as well as errors made by networks while predicting.