

Predicting daily averaged PM₁₀ concentrations in Seoul Based on a Network with Gaussian Kernel Functions

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Abstract

- motivation
- proposed method
- results and meaning

This paper presents a new method of air quality prediction based on phase space analysis for PM₁₀ series. For the prediction model, a network with Gaussian kernel functions is selected and this network is optimized by using a noise variance estimate. As a result, the proposed model provides the high accuracy of predicted values.

Keywords:

PM₁₀, time series prediction, phase space analysis, Gaussian kernel functions

1. Introduction

- air quality prediction problem
- PM₁₀ data in Seoul
- time series analysis and prediction
- proposed method
- results and meaning

Recently, as the problem of air pollution in Seoul becomes more serious, interest in air pollution of people is greatly increasing. This paper presents a new method for predicting PM₁₀, Mass concentration of particles with an aerodynamic diameter less than 10 μm , one of the measures of air pollution.

In order to predict daily concentration of PM₁₀, a database of one hour unit was used and the database was measured in Seoul, Korea. The database

is downloaded from "AirKora".

2. Phase Space Analysis

- refer the paper of stock price prediction

3. Gaussian Kernel Function Networks

- refer the paper of stock price prediction

4. Optimal Structure of GKFNs

- refer the paper of stock price prediction

5. Simulation

- explain PM₁₀ data in Seoul
- simulation set up
- proposed method
- simulation results: TVAREX, MLP, k-SVM, GKFN
- analysis of simulation results

6. Conclusion

- motivation
- proposed method
- results and meaning
- future work

Acknowledgment

References