

Recurrent Neural Nets and Multiple Quantile Regression are used to predict ozone pollution.

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Abstract

Ozone at ground level is known to be hazardous to both human health and agricultural production; hence, its quantities at ground level are constantly monitored in most parts of the world today. However, because it is impossible to estimate ground-level ozone concentrations, this issue presents a big worry in urban areas all over the world. In this paper, we study the use of deep recurrent neural nets to forecast ground-level ozone concentrations in Santiago (Chile), one of the most polluted cities in South America. Santiago is located in Chile. It has been discovered that the accuracy of current prediction models for maxima of the ozone concentration one day in advance is frequently lower than was anticipated. As a result, their practical utility as instruments to anticipate significant pollution events is restricted. In order to solve this problem, we have come up with the idea of implementing a multitask learning criteria, in which the model is not only taught to predict the expected value at the next time step but also multiple quantiles of the response distribution. This would be done in order to address the issue. Experiments conducted on real data have shown that applying this methodology results in an improvement in the prediction accuracy for high values of the time series.

(Keywords:)

Time Series Forecasting, Deep Learning, Probabilistic Forecasting , Air Pollution

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