

عنوان مقاله:

Application of Poisson Hidden Markov Model to Predict Number of PM_{2.5} Exceedance Days in Tehran During ۲۰۱۶-۲۰۱۷

محل انتشار:

مهندسی بهداشت محیط, دوره 4, شماره 1 (سال: 1396)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

PM_{2.5} is an important indicator of air pollution. This pollutant can result in lung and respiratory problems in people. The aim of the present study was to predict number of PM_{2.5} exceedance days using Hidden Markov Model considering Poisson distribution as an indicator for people susceptible to that particular level of air quality. In this study, evaluations were made for number of PM_{2.5} exceedance days in Tehran, Iran, from Oct. ۲۰۱۰ to Dec. ۲۰۱۵. The Poisson hidden Markov model was applied considering various hidden states to make a two-year forecast for number of PM_{2.5} exceedance days. We estimated the Poisson Hidden Markov's parameters (transition matrix, probability, and lambda) by using maximum likelihood method. By applying the Akaike Information Criteria, the hidden Markov model with three states was used to make the prediction. The results of forecasting mean, median, mode, and interval for the three states of Poisson hidden Markov model are reported. The results showed that the number of exceedance days in a month for the next two years using the third state of the model would be ۵ to ۱۶ days. The predicted mode and mean for the third months afterward at the third state were ۱۱ and ۱۱. These predictions showed that number of exceedance days (predicted mean of ۶.۸۷ to ۱۱.۳۹ days) is relatively high for sensitive individuals according to the PM_{2.5} Air Quality Index. Thus, it is essential to monitor levels of suspended particulate air pollution in Tehran.

کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1912179>

