Universiti Teknologi MARA

Mathematical Model of Air Quality Index (AQI) in Peninsular Malaysia using Support Vector Machine (SVM)

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

The presence of poisonous gases in the air is called air pollution. Malaysia is one of the developing countries strives towards development and industrialization. Air pollution is becoming a major environmental issue in Malaysia due to the increasing number of vehicles, open burning, release of chemical toxics from factories. All these air pollutants have a big impact on human health as it is reflected in the increase of hospital admissions particularly the respiratory, cardiovascular diseases and also to the surrounding environment. This study focused on the formulation of Cumulative Index (CI), comparative analysis of the proposed CI with the existing Air Quality Index (AQI) and classify the classes of CI. Monthly data of five air quality parameters which are Carbon dioxide (CO), Ozone (O_3), Sulfur dioxide (SO_2), Nitrogen dioxide (NO_2), and Particular Matter less than 10 microns (PM_{10}) in 37 monitoring stations for four years from 2013 to 2016 were gathered from Department of Environment (DOE). Microsoft Office Excel was used to run the AQI and CI. Thus, the Support Vector Machines (SVM) is proposed to classify CI. Classification classes are divided into two types which are good and harmful. This classification classes were derived from the helped by Rattle with R. The Radial Bias Function (RBF) is more accurate compared to Linear Function in order to classify the accuracy of the CI data. In a nutshell, from the research the classifier performs well to classify the quality of air. Hence, it can help the government sector to calculate the Cumulative Index by using a mathematical model.

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