Contribution ID: **42** Type: **Oral Presentation**

Air quality prediction of Ulaanbaatar using machine learning approach

Tuesday, 23 March 2021 15:00 (30 minutes)

The capital city Ulaanbaatar is one of the most polluted city in the world. The government are looking for suited solution decreasing the air pollution, but it could not work out efficiency. Air pollution is contained from various components like particulate matter (PM) , gaseous pollutants like ozone, nitrogen dioxide (NO2), carbon monoxide (CO), sulfur dioxide (SO2) and other organic compounds. Ulaanbaatar city have 15 air quality monitoring stations. There are some air quality monitoring data of Ulaanbaatar, that PM10 particulate matter in January 2019 was 5% higher than air quality in 2018 and tolerance level is 2.5 times higher than air quality standard (WHO), the average amount of PM2.5 in January was 12% higher compared to the same period of the previous year and 3.9 times higher than the air quality standard, also the average amount of nitrogen dioxide in January was 10% higher than 2018 and 1.1 times higher than the air quality standard, the amount of sulfur dioxide in January 2019 was 1.2 times higher than the air quality standard compared to the same period in 2018. The air quality is affected by Ger district, vehicle, furnace, industry, thermal power station and other.
Predicting and forecasting air quality is the one of the most essential activity in the Smart City. Recently, there are many study to use the machine learning approaches for evaluating and predicting air quality using big data. The aim of this study is to obtain machine learning model for air quality forecasting using previous air quality station data and the weather data. The air quality depends on multi-dimensional factors including location, time, weather parameters, such as temperature, humidity, wind direction and force, air pressure, etc. There are many machine learning approaches, but artificial neural Network model tries to simulate the structures and networks within human brain. It is convenient for working to find relation between multi parameters. If the neural network could determine the relation of the air quality using the weather and air quality data of last year, it is possible to predict approximately air quality of Ulaanbaatar city. We used input layers including parameters of temperature, humidity, wind direction, air pressure, PM2.5 and PM10, NO2, CO, SO2 and measuring time to build neural network model. We are working on the neural network model and this time we are going to introduce the machine learning approach predicting air quality of Ulaanbaatar. In the further work we are going to do experiment of neural network algorithm of the air quality prediction and to discuss machine learning results.

Primary author: Mrs BADRAKH, Otgonsuvd (Mongolian Academy of Sciences)

Presenter: Mrs BADRAKH, Otgonsuvd (Mongolian Academy of Sciences)

Session Classification: Earth & Environmental Sciences & Biodiversity Applications

Track Classification: Earth/Environmental Sciences & Biodiversity Applications