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PREDICTING WHAT WE BREATHE: MACHINE LEARNING, SMART CITIES, AND SPACE DATA

Abstract

The City of Los Angeles is in a unique situation to be an urban proving ground to look at how to better understand, predict, and mitigate the issues of air pollution for 4 million citizens. This project looks at the time-series measurements of aerosol and ozone data and public and private ground data sensors and applies machine learning to uncover patterns that may not be discernible to human analysts. By enhancing human understanding and prediction of air quality, local governments and others can help mitigate the effects of air pollution through interventions that have measured results. Data has been federated from multiple sources, many of which are provided by space agencies and Federal, State, City, or other organizations, and this allows for easier data federation and layering through the OpenAQ platform. Partners on this project include the South Coast Air Quality Management District (AQMD) and the County of Los Angeles, and private organizations like Anthem Blue Cross, and community groups like the Southern California Asthma Association.

Ambient air quality data (PM2.5, PM10, O3, and NO2 from ground monitoring sources in other global cities will be accessed via the OpenAQ Platform (openaq.org), which is an open-source platform (github.com/openaq) that makes available historical air quality data from government and research sources, and has aggregated 405 million air quality measurements from 10,386 locations in 70 countries. Data are aggregated from 117 government level and research-grade sources. The disparate data sources are made available through one harmonized data format, making the dataset well-suited to analyzing and comparing cities' ambient air quality. Satellite data from NASA's MODIS and Terra and ESA's Sentinel platforms are also included.