

Milestone II - Application

Computing Project 2016/17
14D003/14D004

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The main goal of this project is to shed light on the possible measures that an emission (reduction) government policy could consider in order to reduce the air pollution most efficiently, and to predict city pollutant concentrations for future years, assuming no policy changes. For this purpose, we want to learn which emission sectors impact the measured air pollutants most in a country (and to what extent) and also try to relate the measured pollutions to the size of city populations.

The data view will provide a series of graphs that focus on factors that impact the air pollution most. The dashboard will provide pairs of pie charts that highlight the sectors with the largest emission output and the sectors impacting city air pollution most for a specific country and time interval.

A second element on the data view section will show a "heat-map" of Europe for a selected pollution type and year. The view should help to observe regional patterns (correlations between close cities) and so learn to what extent air pollution is a local problem. In order for this dashboard element to work, we will need to add geographical coordinates for each city in our database.

The analytics view will focus on the prediction of future pollution levels for particular cities and countries for future years, using Bayesian regression. Depending on our findings of what factors impact pollutants most, the predictions will be either based on observed/predicted national emission trends and/or observed and expected population growth. In the second case, the dataset needs to be extended by city population growth data. The predictions will be presented graphically, with the user being able to select a city/country and a particular pollutant type. The line graphs will include standard errors. Based on the city-level predictions, a separate graph will show the predicted total number of cities expected to exceed the annual European limits for future years.