ClimateWatcher

Exploring computational prediction methods for environmental damage that can be independently verified.

The problem

Research Replicability	Context	Problem statement
Most of research in climate change is not replicable outside labs without supercomputers.	Literacy and education rates in the world are higher than ever. Establishing a certain outcome through experimentation provides more retention in humans.	Make environmental impact capable of being independently validated through experimentation by reducing the barrier to entry for such projects.

Challenges deep-dive

Challenge 1

Challenge 2

Challenge 3

Data Acquisition

Environmental impact data is not easily available , and even if available often not high dimensional enough..

Modelling

This would require a significant rethinking of the prediction process. Current models rely on first principles making it extremely computationally intensive.

Observing Trends

The predictions over smaller areas need to be generalizable in the form of patterns hidden in the data.

Solution

Develop computational methods to predict environment damage, that can be independently validated by community members to legitimize research and increase public environmental concern.
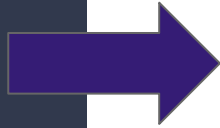
Implementation

Predicting Pollution

National investment in tracking the pollution levels has lead to a sudden explosion in the amount of good data available for usage.

Most of this is open to access, with a little bit of data mining.

Breezometer has accomplished a fairly street-level accuracy in predicting pollution values, through complex system modelling.

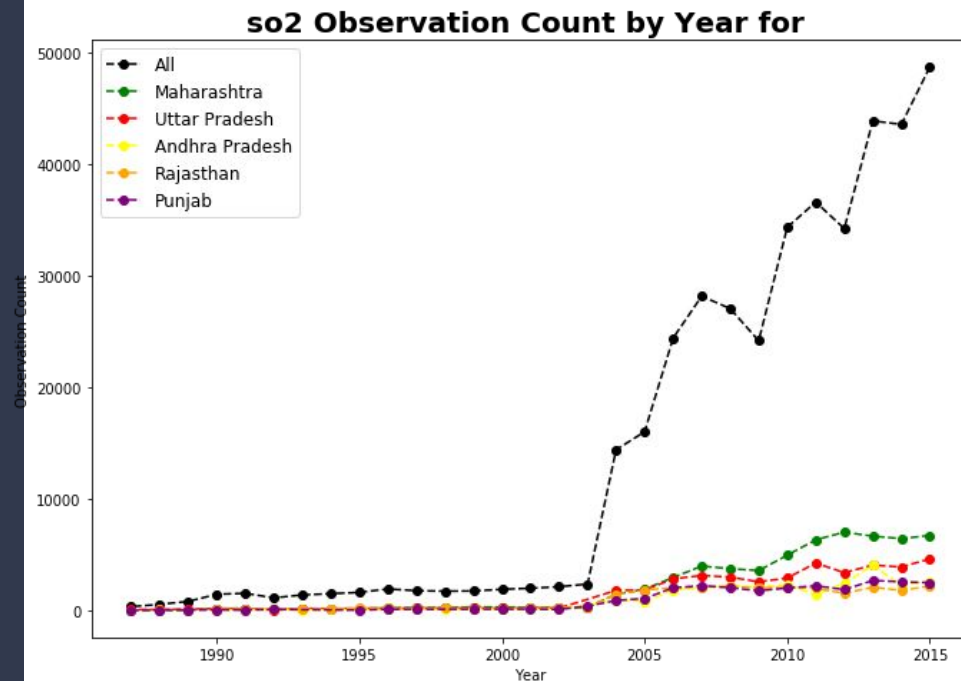This should be recreateable to a certain extent.

Modelling on Data

RNNs (LSTM)

Approximating a sequence of vectors using a recurrent neural network.

LSTM models have shown state of the art accuracy levels in challenging sequence prediction problems.

Often the tool of choice to predict stock trends.

so2 Observation Count by Year for

Disclaimer

I've never done predictive analytics in the domain of environmental monitoring before. This entire case study might in essence be completely flawed in a number of ways, and in certain ways not be completable, however is an ambitious attempt at tackling the problem stated before.