Friedrich-Alexander-Universität
Technische Fakultät

Analyzing the Impact of Air Pollution on Urban Climate in London

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Agenda

01 Introduction

02 Datasets

03 Analysis

04 Conclusion

Introduction

Introduction

Dataset

Used Data

London Weather Data

Source: Kaggle

- **URL**: London Weather Data on Kaggle
- **Period**: 1979 - 2021
- **Description**: This dataset includes historical weather data from London, collected from a weather station near Heathrow Airport. It features daily measurements such as temperature, humidity, and precipitation.
- **License**: Public Domain (CC0)

London Air Quality Levels

- **Source**: London Datastore
- **URL**: London Average Air Quality Levels
- **Period**: Data available till 2019
- **Description**: This dataset provides readings of air pollutants including Nitric Oxide, Nitrogen Dioxide, Particulate Matter (PM10 and PM2.5), and Ozone. Measurements are collected from various monitoring sites across Greater London.
- **License**: UK Open Government Licence (OGL v2) (allowing use with attribution. Obligations include acknowledging the data source and maintaining a link to the license.)

Used Data

London Weather Data

- date
- mean_temp
- max_temp
- min_temp
- precipitation
- pressure
- global_radiation
- cloud_cover
- sun_shine

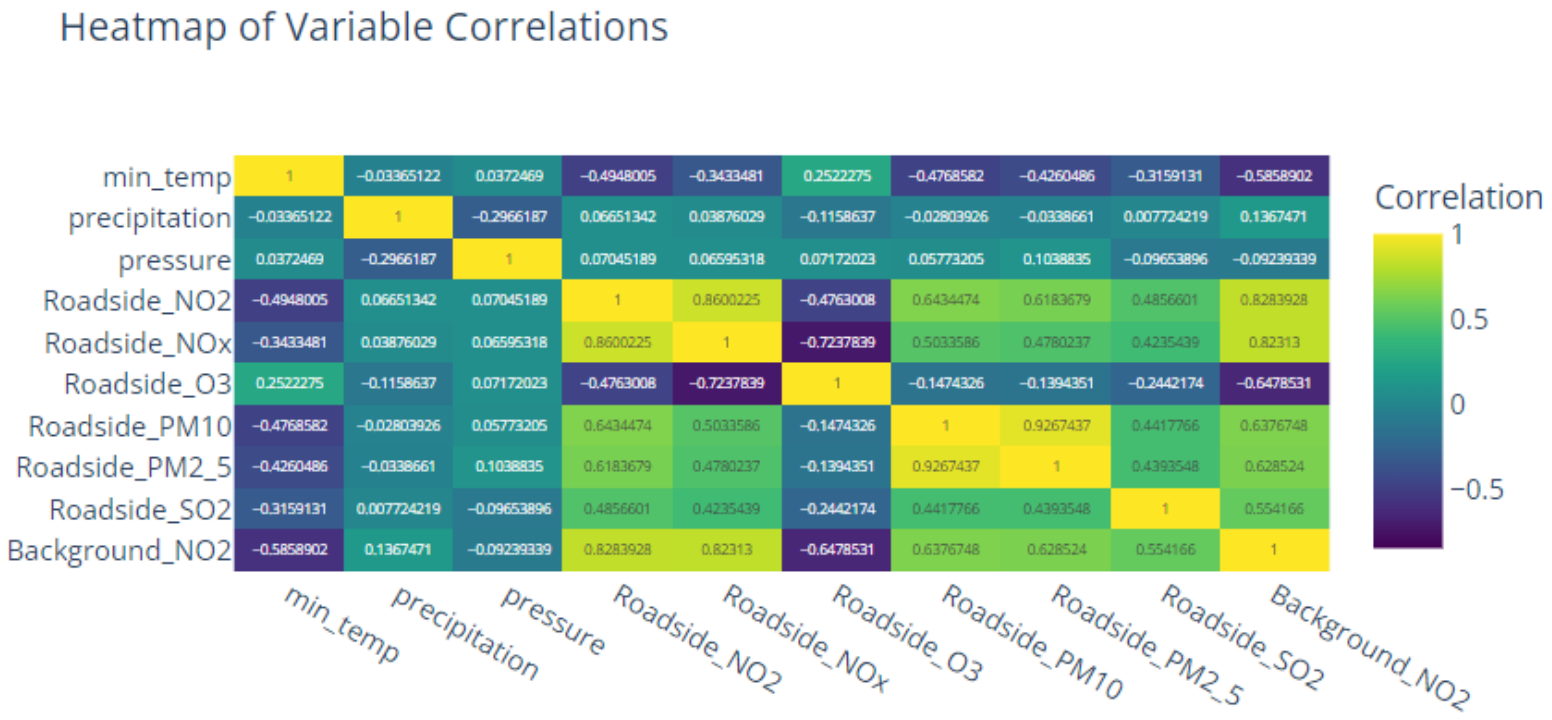
London Air Quality Levels

- date
- Roadside_NO2
- Roadside_NOx
- Roadside_O3
- Roadside_PM10
- Roadside_PM2_5
- Roadside_SO2
- Background_NO2
- Background_NOx
- Background_O3
- Background_PM10
- Background_PM2_5
- Background_SO2

Analysis

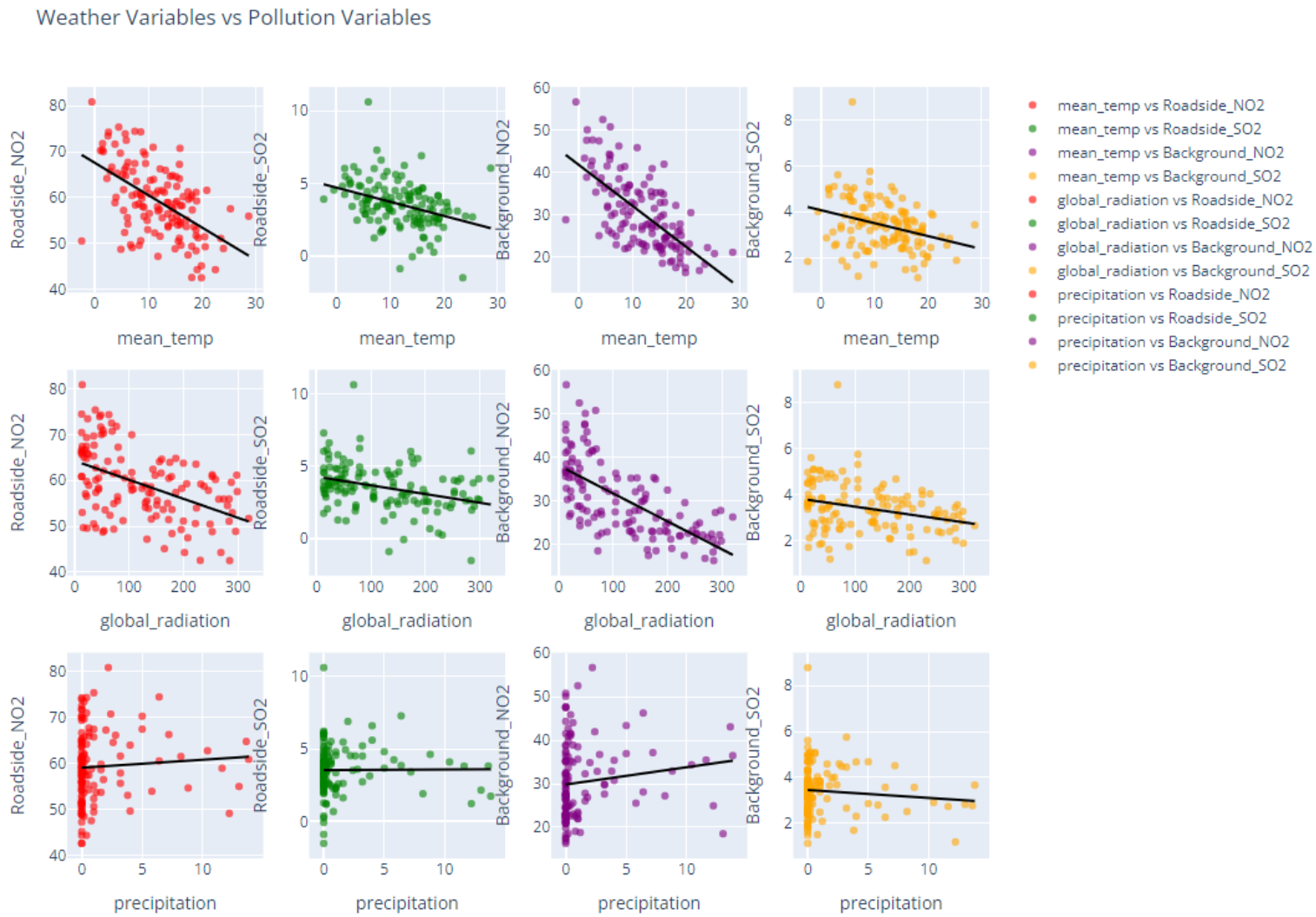
Analysis

heatmap of variable correlations



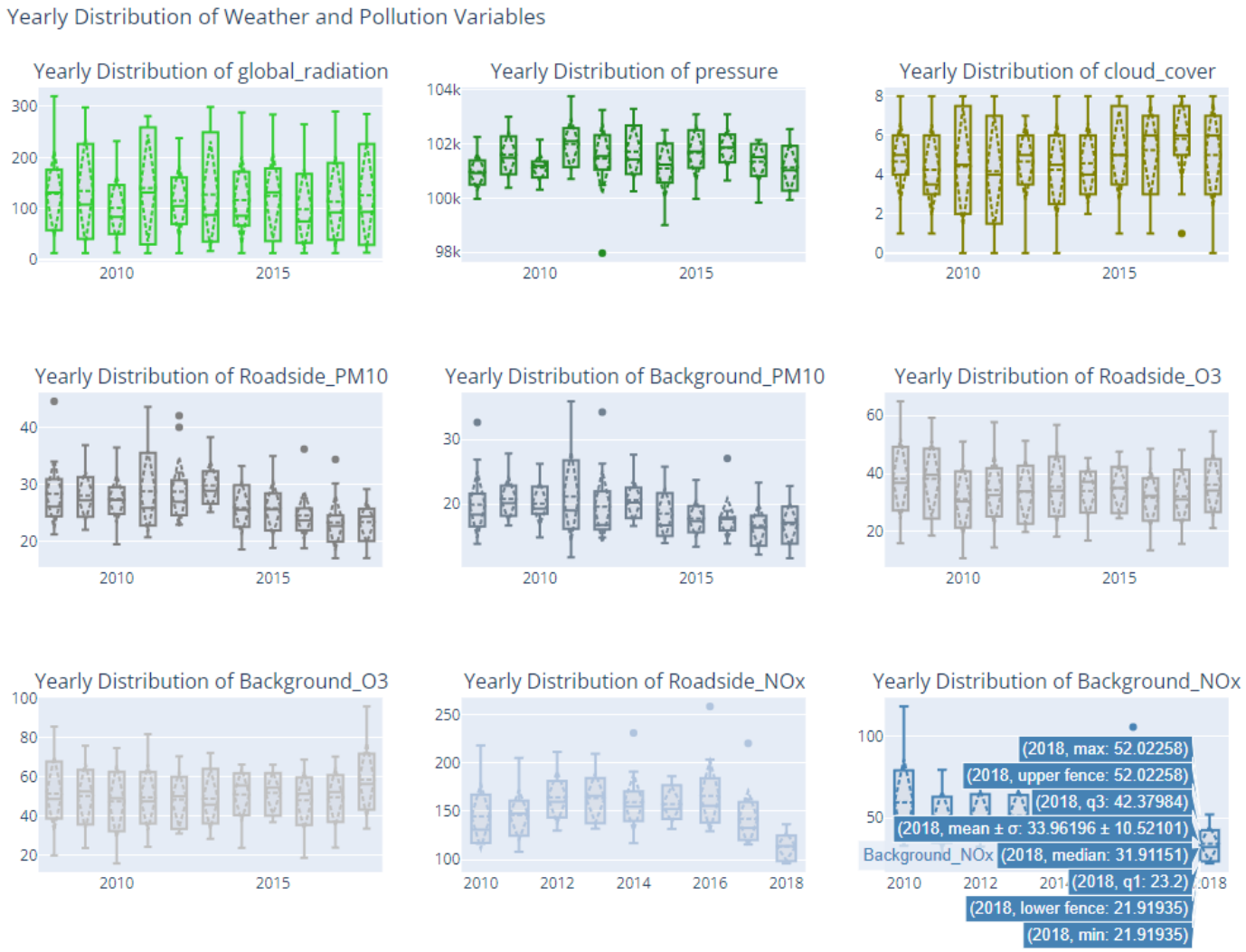
Analysis

Weather Variables vs Pollution Variables



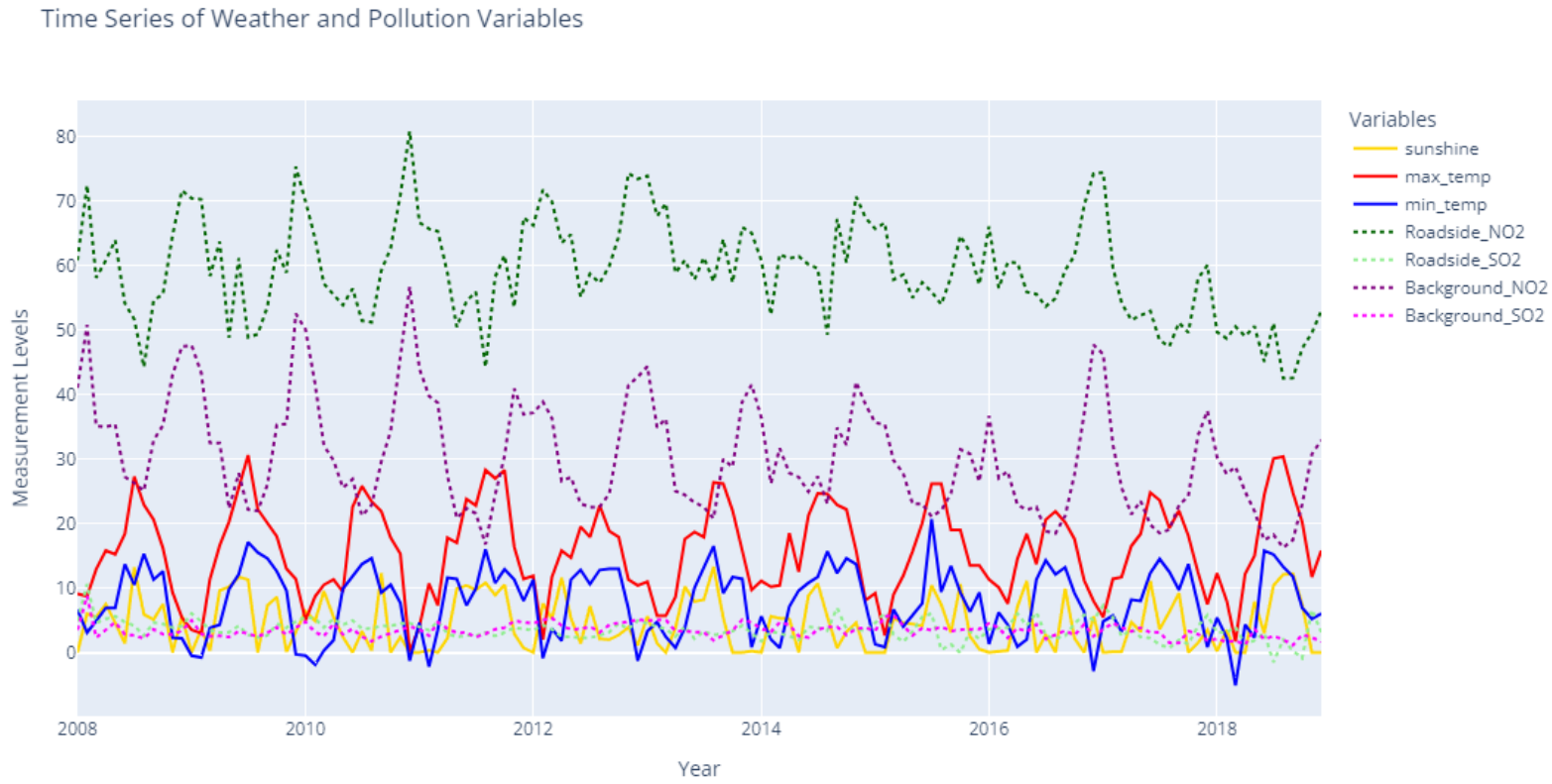
Analysis

Yearly Distribution of Weather and Pollution Variables



Analysis

Time Series of Weather and Pollution Variables



Conclusion

Conclusion

- **Temperature and Pollution:** Negative correlation between mean temperature and NO2 levels, indicating warmer temperatures help reduce NO2.
- **Max temp:** Exhibits distinct peaks during the summer months each year, which typically correspond to lower concentrations of pollutants such as NO2 and SO2.
- **Precipitation Effects:** Mixed impacts on pollutants, with rain generally reducing levels of SO2 but less effect on NO2.

Impact of Solar Radiation: Positive effect of global radiation in reducing pollutant concentrations.

- **Limitations:** Exclusion of real-time traffic data and specific emission sources, in the other variables like PM10 due to spikes.
- **Future Research:** Need for further studies incorporating additional factors affecting urban air quality in the other variables like pressure.

Thanks for your attention!