Artificial Intelligence and Data Science for Air Pollution Prediction and Visualization

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Sponsors: **NASA & LA City**
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Background

NASA in collaboration with Los Angeles City utilizes ArcGIS and React to create a website for the people of Los Angeles to help with a common problem in LA city. The high dense smog, and inadequate air quality.

Significance:

Los Angeles and its surrounding areas have continuously had bad pollution rates. Chinatown between 2016-2017 reported dangerous air quality 117 times.

Objective

Our objective is to utilize Data Analytics and Artificial Intelligence methods along with technologies like ArcGIS and React to make an easily accessible,easy to understand website and mobile app for the people of Los Angeles to comprehend air quality at a glance. Data science technologies and visualization methods allow us to properly give the people of Los Angeles an accurate reading of PM2.5 a week in advance.

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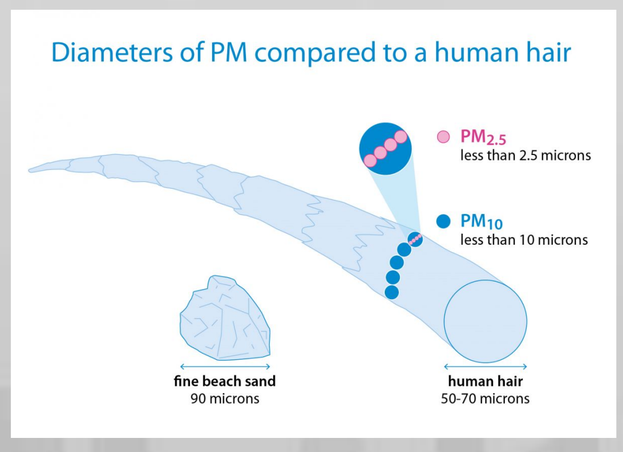


What is Air pollution?

Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.

Particulates:

Air pollution comes in several shapes we mostly focus on two..
-PM 2.5 and PM10: small fine solid or liquid particles in air
-origin:dust,soot,smoke,industry, volcanos,polen, soil.

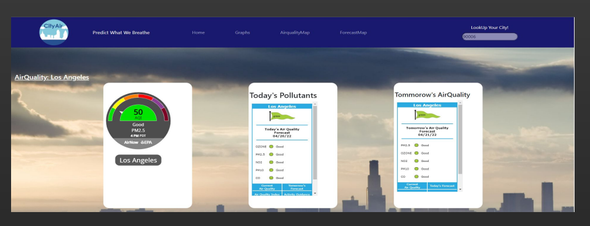


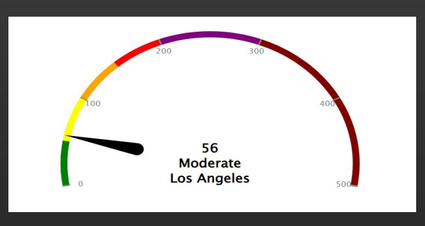
AQI LEVEL	Health Descriptor	Meaning
0 - 50	GOOD	Quality is considered satisfactory and poses little or no risk to health
51 - 100	MODERATE	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution
101 - 150	UNHEALTHY FOR SENSITIVE GROUPS	Although the general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air
151 - 200	UNHEALTHY	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects
201 - 300	VERY UNHEALTHY	Health alert: everyone may experience more serious health effects
301 - 500	HAZARDOUS	Health warnings of emergency conditions; the entire population is more likely to be affected

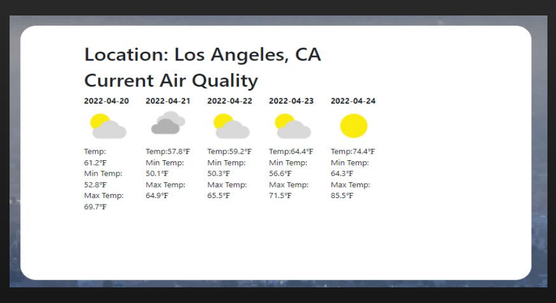
Goals:

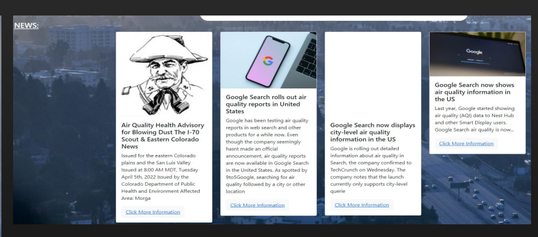
- Develop a web application that provides
  - Easy access to current and forecasted air quality information that is also based on user location
  - a variety of visualization aids

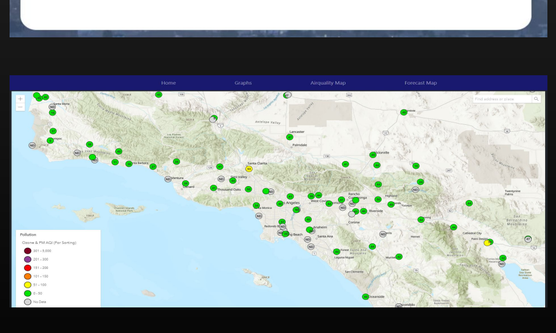
Website Development:

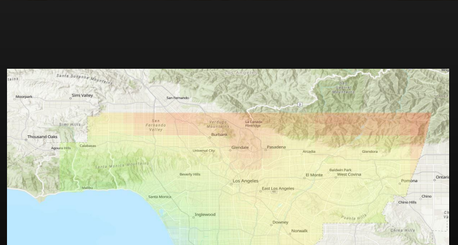










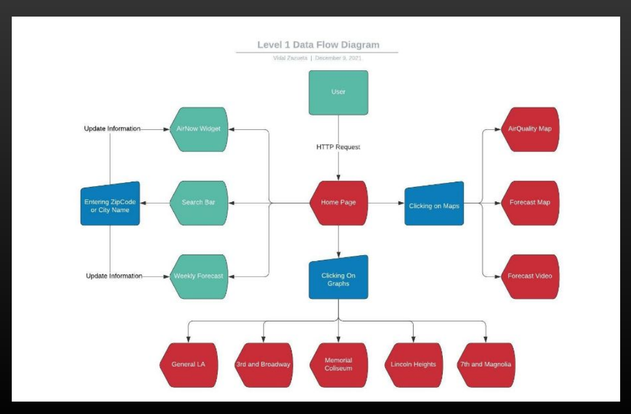


Who is at Risk:

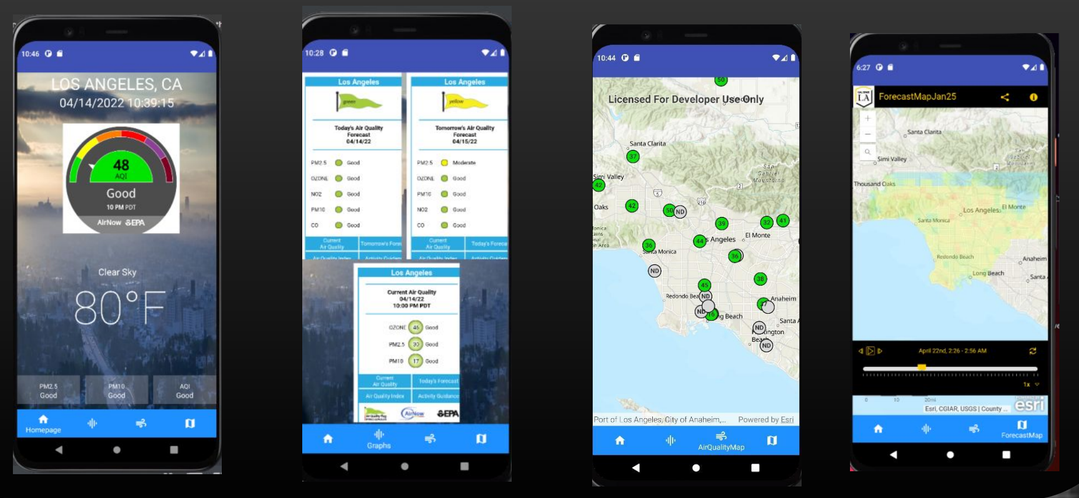
- Everyone
- Children
- Immune compromised individuals with Lung and heart conditions i.e asthma, heart disease



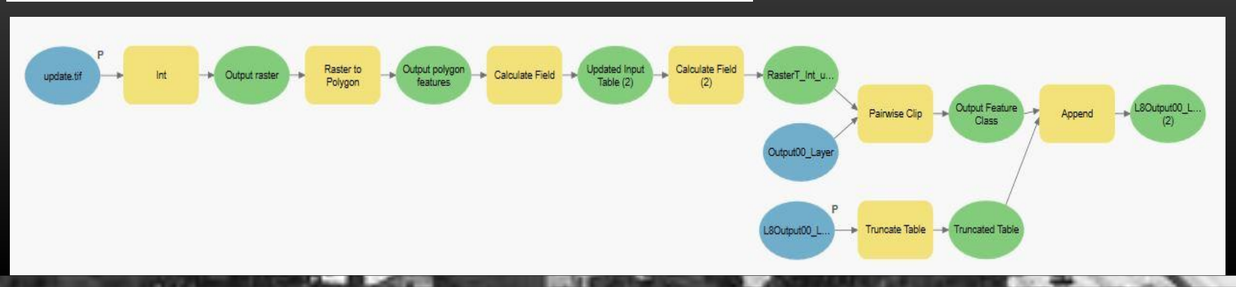
Data Flow diagram:



Mobile App Development:



ArcGIS Automation Model



Conclusion:

- Air Pollution contributes annually to millions of deaths worldwide and must be taken seriously
- Making Air Quality readings and forecasting accessible will help in making more timely response

Tools/Technologies Used:

Android Studio, node.js, Kotlin, HTML5, CSS3, JavaScript, React, Heroku, aws, ArcGIS Pro, python, TensorFlow