Breath of Fresh Air

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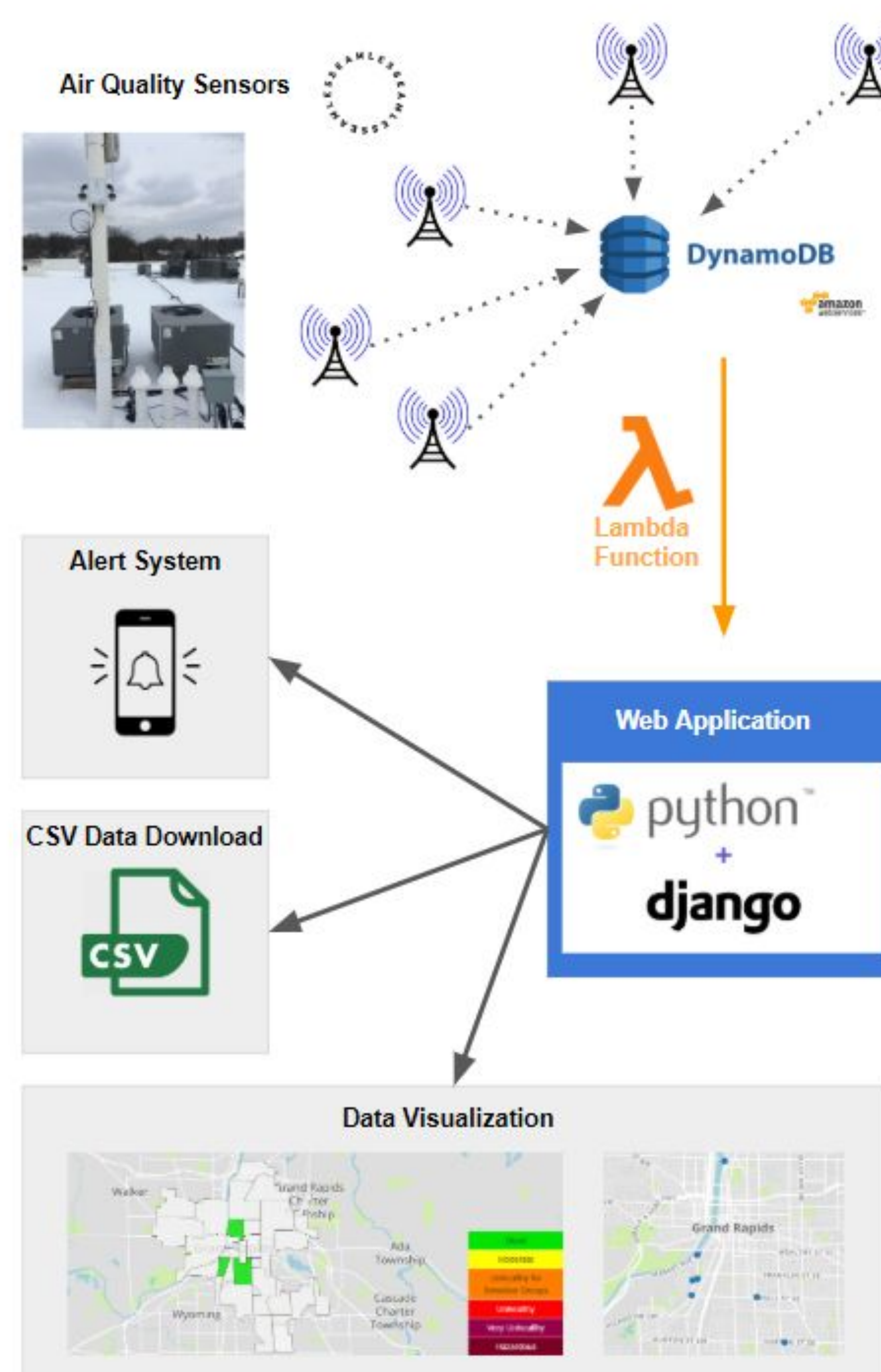Sponsored by: Seamless IoT

Goal

Our project is a community-focused, educational web application designed to inform Grand Rapids residents of real time air quality metrics. We use data gathered from sensors around the city to visualize, interpret, and manage pollutant information.

Web Development

We used the Django web framework to develop our web app. We included several pages. The first is our home page where you can register for our alert system. Then there is also an About Us and AIr Quality Guide page to give more information to users on our project and why air quality is important. We also have an air quality report which shows real time data on the air quality.

Data Management

The raw data that we received from the air quality sensors is sent to a Dynamo database. From here we pulled the data and cleaned it using noise reduction techniques. The different pollutants pulled from the sensors are all analyzed and the different risk levels are compared. This data was then used for data visualizations, the alert system, and the downloadable CSV file.

Data Visualization

We used the Dash library by Plotly to help us visualize the data. The two main graphs we focused on was a heat map(figure 1) and a location map (figure 2). The heat map follows the scale in figure 3. The different sections with sensors in the map will be the color that matches the table. This allows users to see what the air quality in their location.

Future Work

Our web app is just the first step towards better air awareness. We added a page to our app that allows citizens to download air quality information for themselves.This data is open source and free to use, provided by the Seamless IOT team. Our group, partnered with Mercy Health, are working to compile air quality data and HIPAA safe information from Mercy Healths clinics for future research on how air quality affects those with pre-exisiting repritory issues.

Alert System

We wanted to give the community the ability to monitor the quality of the air around them. Our alert system allows the community to have alerts about poor air quality at a moments notice. We have a sign up page that allows user to sign up for either alerts via text message or email. This allows people in Grand Rapids to take control of their health.