

CleanAir

SE491/591

Paul Duszak, Jessica Oberg,
Xin Qu, Tony Sarles, Terry Schmidt, Peter Swantek



Background

“Ozone, when it occurs at ground level, presents a serious air quality problem in many parts of the United States. When inhaled— even at very low levels— ozone can cause a number of respiratory health effects” - US EPA



Background

The problem of air pollution is becoming more and more problematic as the world becomes more industrialized.

Cleanair helps users monitor pollutant levels around the world. Alerting users when appropriate.



Goals

Two main ideas behind the project:

- Users should be able to utilize the sensor and collect and upload readings of hazardous particulates
- Consumers should be able to receive data and warnings from the collected readings

The Case of a User's Safety



Our biggest concern is that our application misreads/misinterprets data being sent. Depending on how reliable the application and interface is, users may become exposed to a harmful environment.

Because of the nature of what we are measuring (long term consequences over immediate displays of symptoms). It is somewhat difficult to truly measure the consequences of our application misreading data. We also have no subject matter expert for our material. We are, however, taking data verification and database maintenance into account. Also, with the addition of more and more readings it would be possible to differentiate outliers.

Workflow



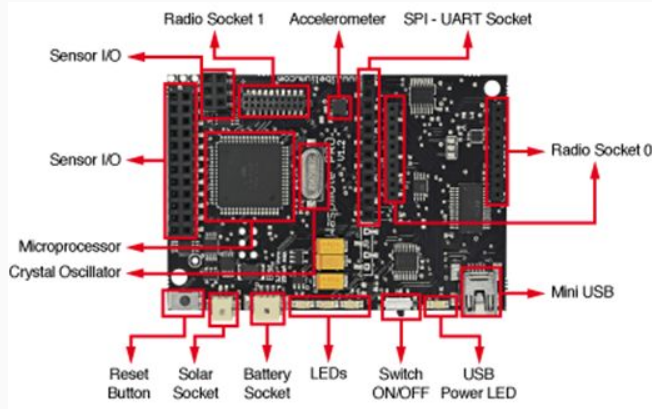
Hardware

- **Wasmote**

- Open source sensor platform
- Modular architecture: Allows for using only desired modules or sensors

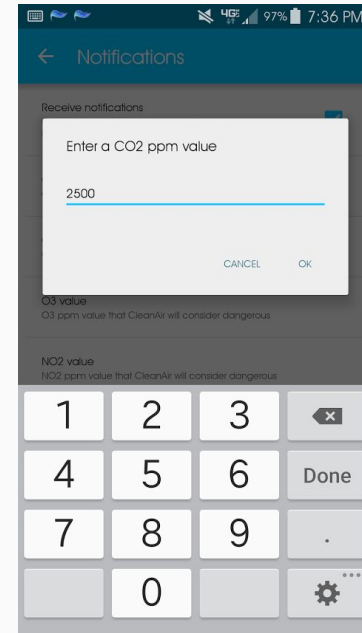
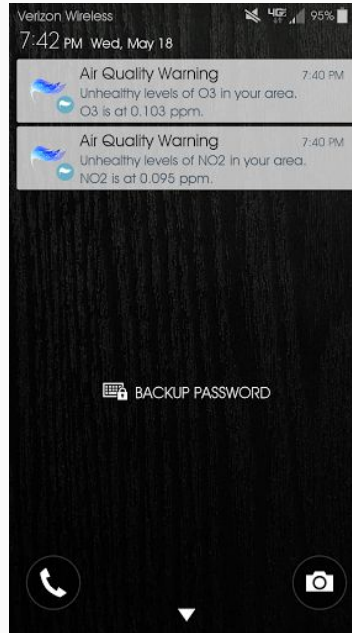
- **Gas Sensor Board**

- Integrates into the Wasmote, designed to monitor environmental parameters
- Allows inclusion of sensors (up to 6) that will measure different gases to allow for quantification of an area's air quality



Android

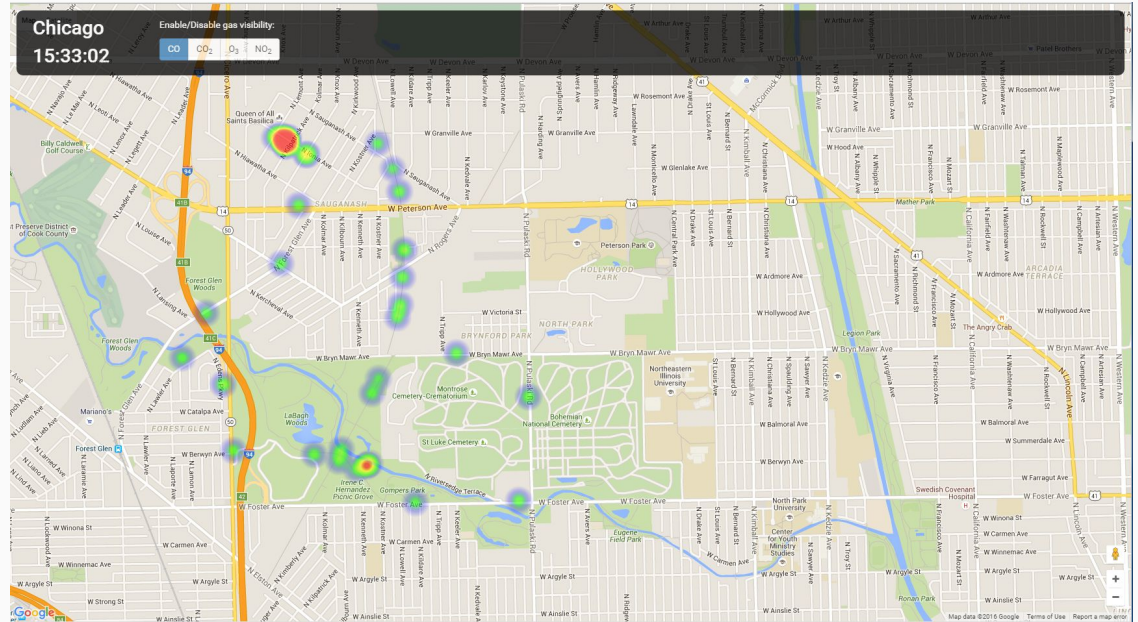
- Users can log in, have an associated user ID
- User can opt to enable data collection/uploading
- Choosing to collect data starts bluetooth connection to hardware
- Data periodically pushed to server, can view data on map via mobile



Web App

Heatmap version

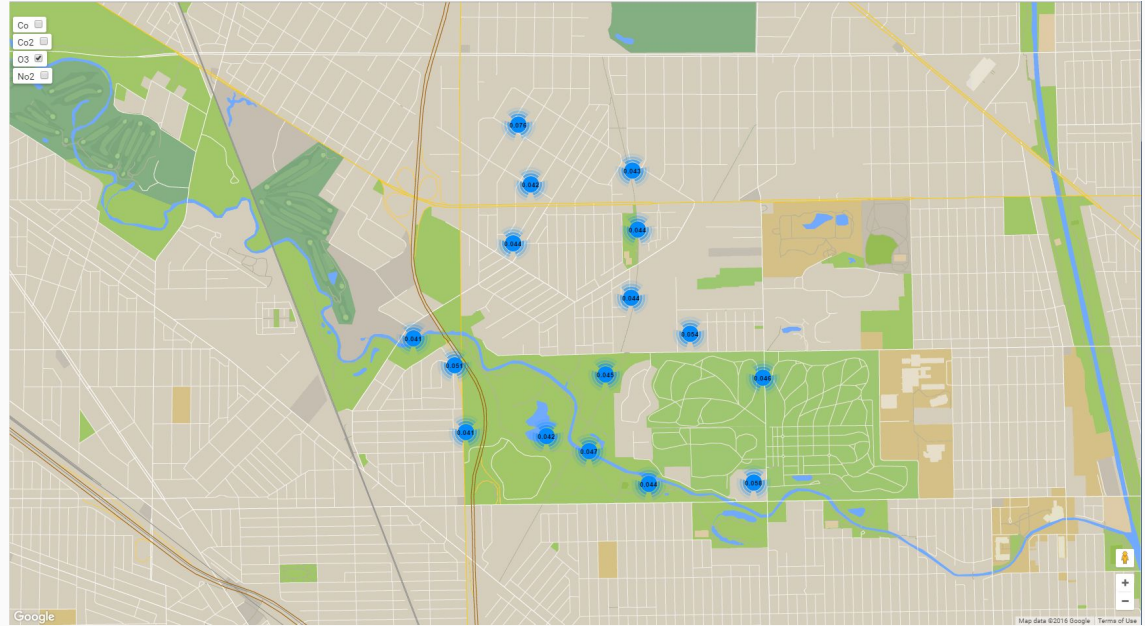
Displays based on readings at given locations and gives a general sense of what data is being passed.



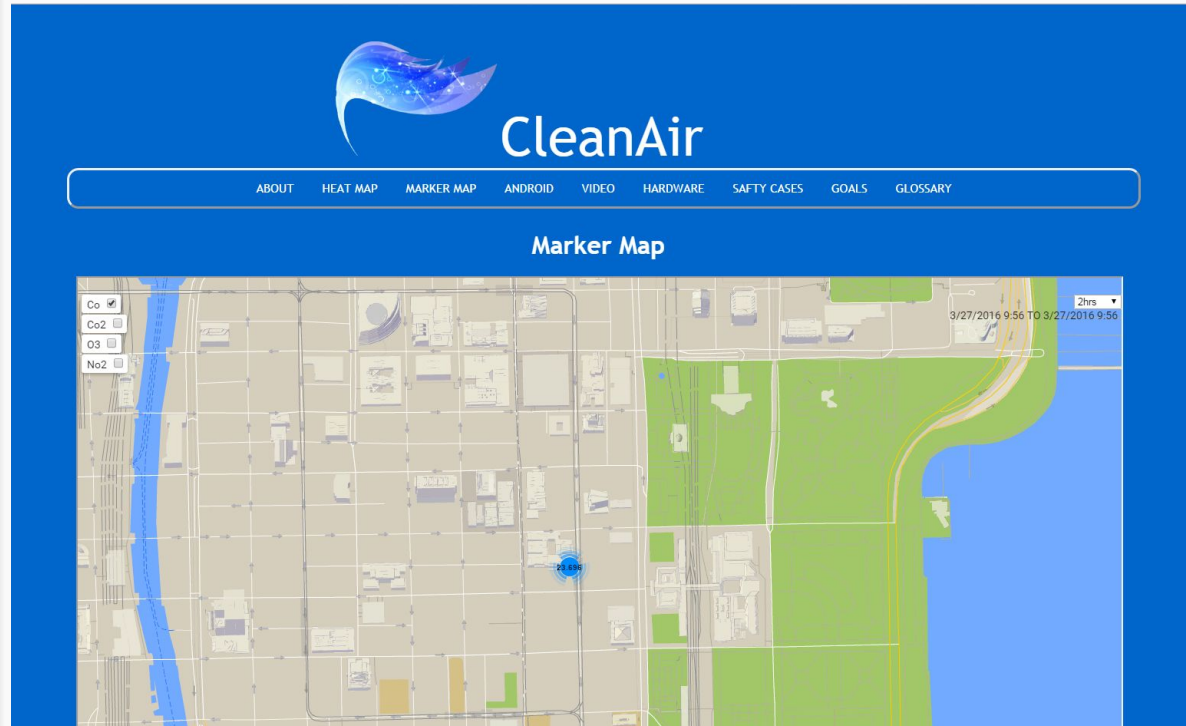
Web App

Marker version

Gives exact readings at given locations. Better for seeing more specific readings.



Web Portal



Field Test

- Taking the WASPMOTE out for real world data
- Collection from various areas around Chicagoland
- Simulate a more extreme situation with burning paper and cigarettes

Field Test

A Slightly Exaggerated
Environment



Thanks