FreshAir

Maddy Butzbach; Emily Lutz; Noah Grossman

Cornell University, Ithaca, NY

Introduction

We identified a problem with the way people currently address the issues of allergies and pollution. Many people know what they are allergic to, but just suffer through daily because they do not have another option. Other people may suffer from mild allergies, but have never gotten concrete information regarding which substances they are allergic to. Finally, many people suffer from pollution-related health problem such as asthma, and if they could be aware of the concentration and location of pollution, they may be able to help themselves.
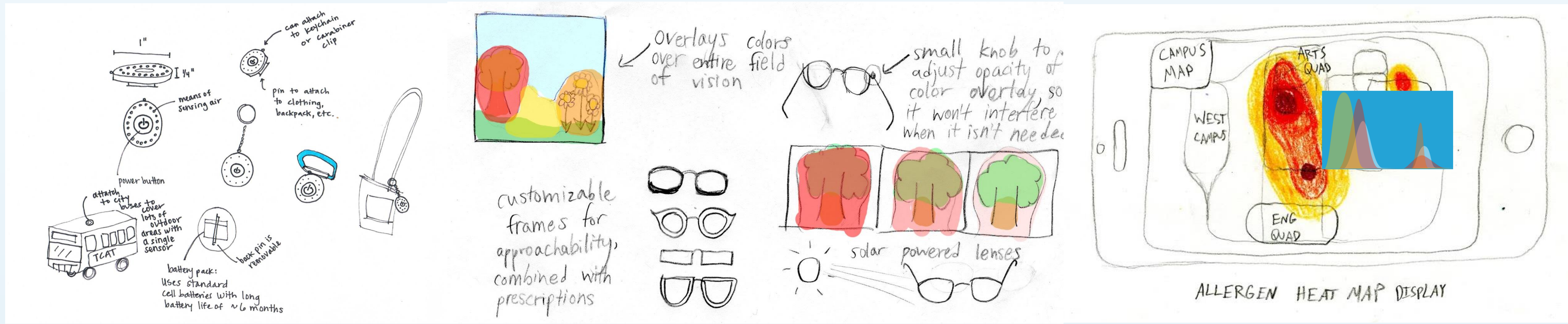

Personas

Jacob (primary): Moderate allergy sufferer. Loves the outdoors but is often hindered by seasonal allergy symptoms such as runny nose and itchy eyes. Doesn't know exactly what he's allergic to or how to best prevent allergic reactions.

Marcee (secondary): Severe allergy sufferer. Must be very careful about avoiding certain allergies because they give her bad reactions, including throat swelling and inflammation of the skin. Finds it difficult to manage her allergies because she has to keep track of them constantly.

Camille (secondary): Lives in a polluted area. No known health problems but health-conscious and concerned about pollution. Wants to learn more about health effects of pollution but doesn't know where to look.


Interface Overview

| System (3 parts)		
Network of sensors: given out to students, buses, and system users to get as much air quality data as possible. Attachable via keychain, clip, or pin.	**Glasses**: glasses also include built-in air sensor, and show the user a visual overlay of sensor information in their line of sight	**Application**: includes sensor integration, map feature for planning around areas with poor air, local reports and air quality news, and other features

Persona Goals / System Tasks:

1. Quickly identify when an offending irritant is in direct vicinity
2. Help prevent or lessen allergy symptoms/ pollution-related health issues, and learn more about your own health.
3. Know in advance where irritants will be present, to plan around them or prepare for contact with them.
4. Detect and report makeup of the air to a very accurate degree
5. Means of finding out information about health effects, and links to reputable resources to learn more.
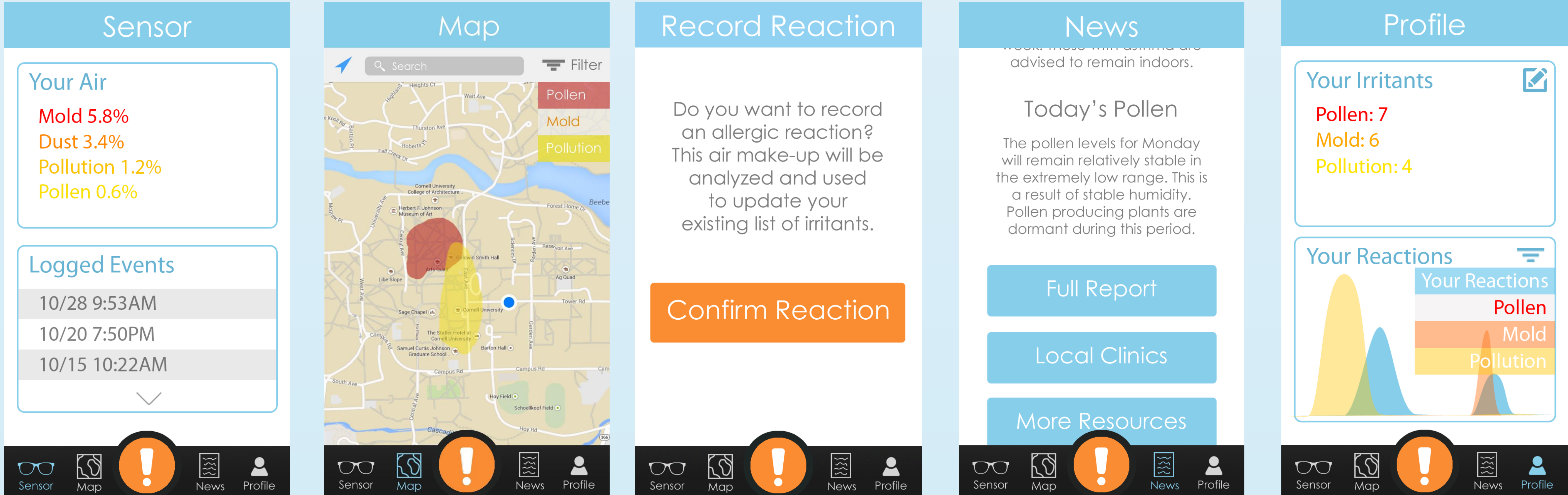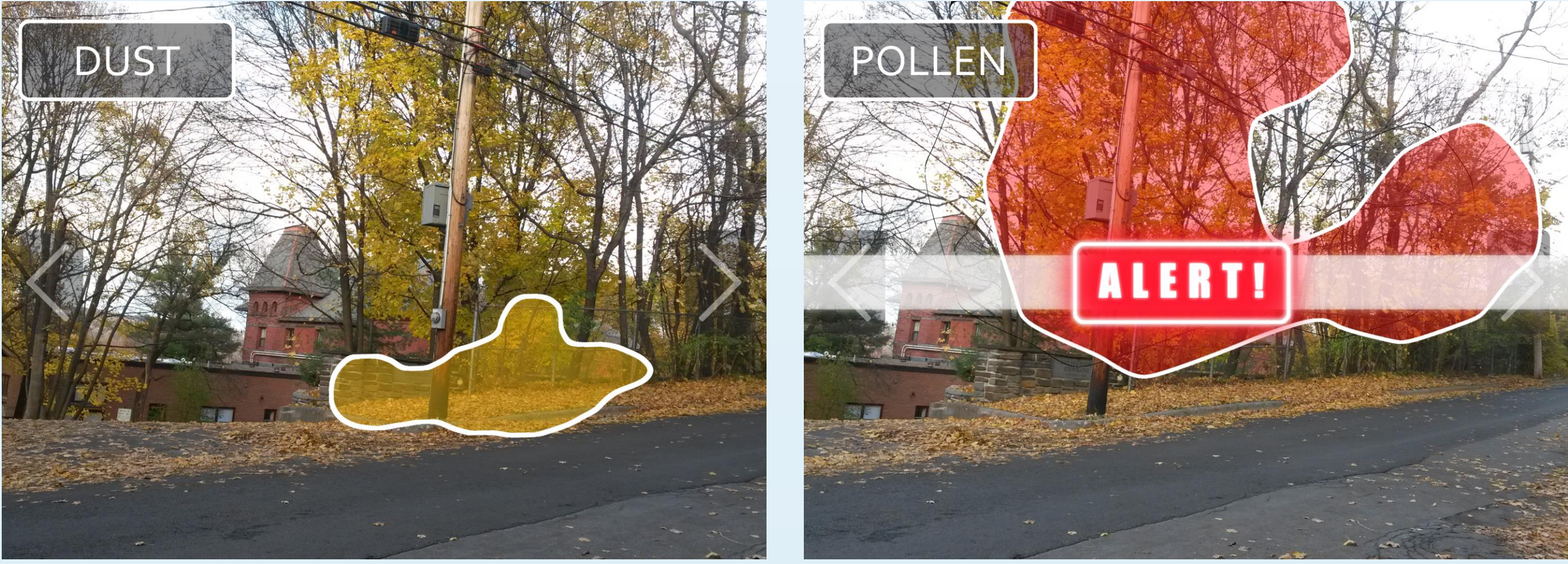
User Testing

Protocol

- Task-based interview, think-aloud method
- One moderator, two observers per interview
- 4 timed tasks covered main functionality of glasses and application and addressed persona goals
- Users wore paper prototype glasses and were given paper prototype sensor to hold; used InVision on laptop or iPhone 6 if possible to interact with interfaces
- Pre- and post-survey questions
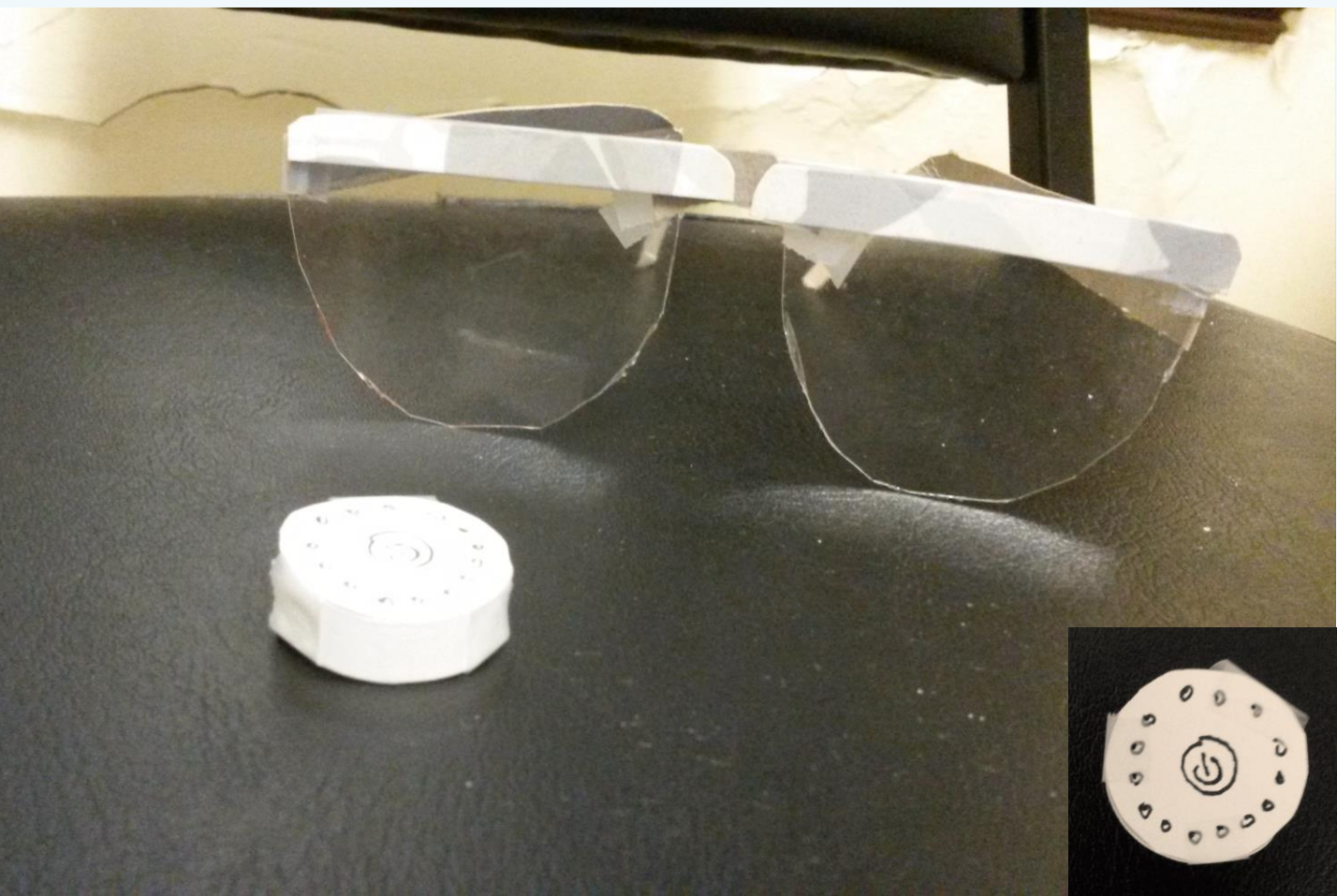
Results

- Users liked the visual display of the app and would find the system helpful
- Mixed reactions to wearing the glasses, but all would carry sensor and many would wear glasses
- Tasks were completed quickly and easily for the most part
- Some confusion about features such as the 'Your Reactions' graph
- Labels need to be fixed on many pages

Problem Group	Problem	Importance	Solution	Priority Rank	Resolution
Help / Documentation	User was initially confused about all the features of the app and how to access them	M	Add a tutorial	1	Fix in this version
Labels	Profile page: user was confused about how the graphs related to each other for the Your Reactions section. User was also confused about what the numbers next to the irritants meant.	5	Label the x-axis of the graph as "time", and label the numbers "severity"	2	Fix in this version
Labels	User was unsure what "filter" meant on the map page and didn't realize that he had to click on an irritant to see it on the map	4	Re-label "filter" on map to "irritants"	3	Fix in this version
Glasses display	User was confused when doing the task of turning off the glasses display because the irritant label remains on the screen when the visual overlay is off	3	When the visual overlay is turned off, the irritant label should also disappear	4	Fix in this version
Escape buttons	User was unsure what to do after recording a reaction	3	Add a back button and a button to go to the profile page graph after reaction is recorded	5	Fix in this version
News section should be more comprehensive	User expressed desire to learn more about irritants other than pollution and pollen in News section reports	2	Add more irritant reports to News section	6	Fix in this version
Labels	User was not sure why the links to local clinics and resources were in the News section	2	Re-label "news" to "info" on the navigation bar	7	Wait until next version - too much work in InVision for such a small fix
Recording reaction requires too many steps	User thought there were too many steps involved when recording a reaction	1	When adding a reaction to a logged event, don't go through the confirmation screen. However, keep the confirmation screen when accessing from the navigation bar to avoid accidental recordings	8	Fix in this version
Help / Documentation	User expressed desire for a home page on the navigation bar to give an overview of the app and a list of features	2	Add a home page	9	Wait until next version - too difficult to change in InVision if changing the navigation bar
Glasses display	User expressed concern that he would not be able to tell exactly where the problem area is through the glasses	2	include depth perception to the visual overlay to make it more clear where the irritant is	10	Wait until next version - too difficult to implement in InVision