Usability Testing Review

Alexis Anand, Katrina Ezis, Ma Shixuan, Cynthia Zhang
CSE 440 Section AD

Usability Testing Summary

All of our usability tests were conducted with students from Computer Science and Engineering. This was in part because many of them were willing to help with our tests, but also, as we discussed earlier in the quarter, students working with computers are a prime stakeholder for our project.

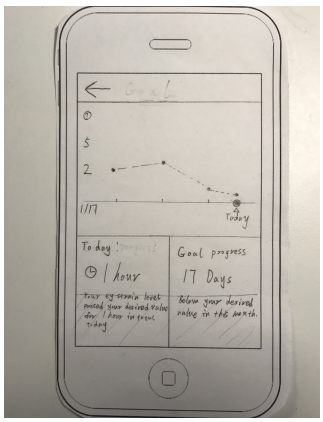
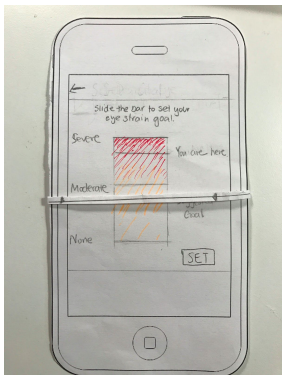
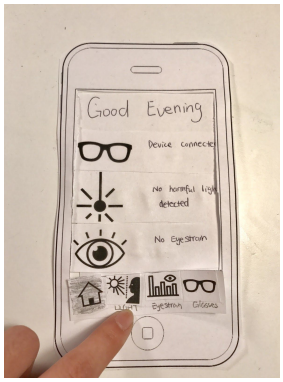
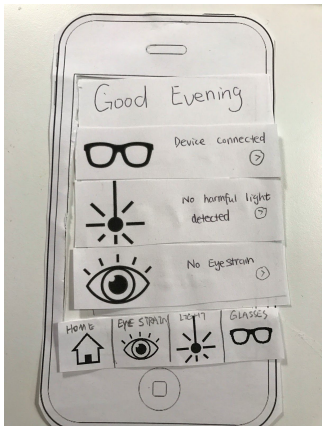
One thing we changed during our tests is how we introduced our participants to the process. Our first tester, after our brief description of the product and task, was still confused about what he was trying to do and why. In our later tests, we provided more detailed scenarios for the tasks (for example, the user was experiencing headaches and wanted to set a goal to reduce them), which seemed to help our participants understand the motivation behind them.

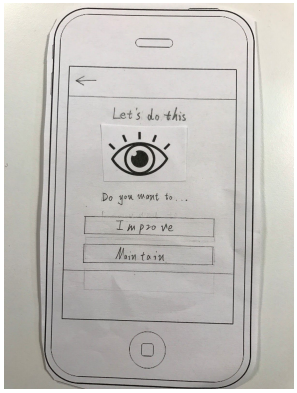
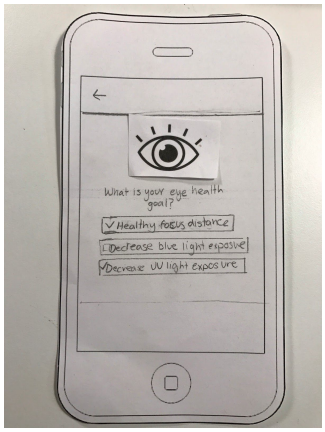
First Usability Test

Our first usability testing participant was Michael. Michael is an undergraduate student at the University of Washington double majoring in Computer Science and Applied and Computational Mathematical Sciences. We think Michael represents our typical user -- he spend a lot of time in front of a computer, and does not think too much about his eye health. We conducted this test in CSE atrium, since it is a place that he visits a lot, and we think it would make him feel comfortable during the usability testing. Due to time conflicts, Cynthia alone did this usability test, and acted as the facilitator and “computer”. For next usability test, we will try to make a plan earlier, and have at least three group members participate.

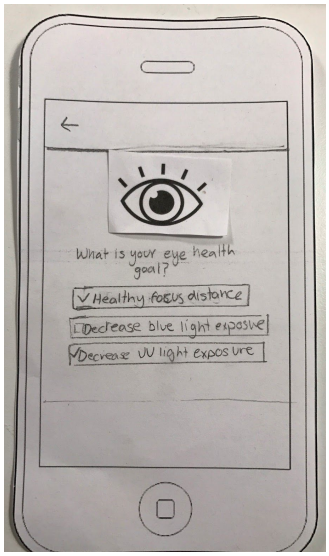
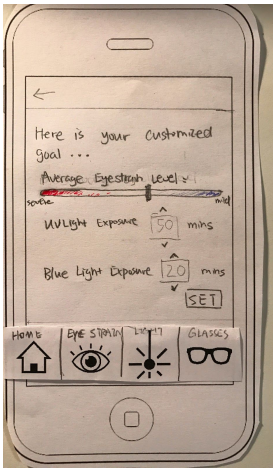
In the usability testing process, we first provided some background on our project and design, and we tell him that his first intuition is important, so we will not answer any questions. We assigned two tasks to him. His first task was to connect his newly-bought glasses to the app. The second scenario was to set an eyestrain goal, given that his eye strain is due to focusing on objects too closely..

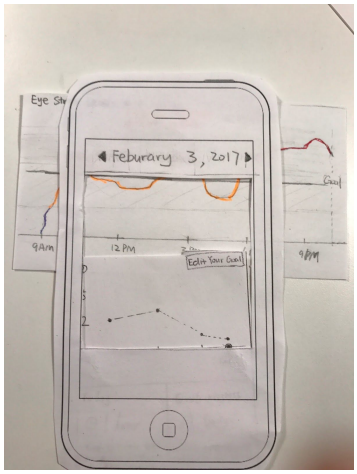
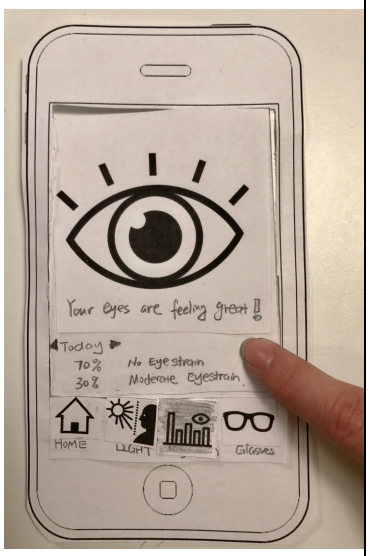
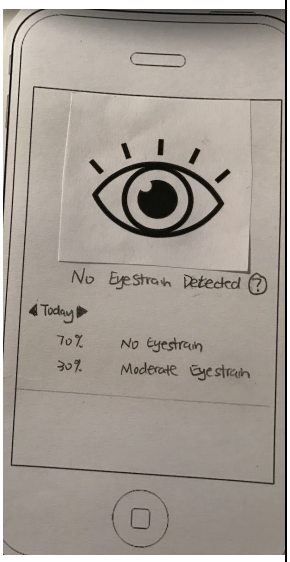
Image	Incident Description	Severity	Revision	Explanation

(no image)	There's no feedback after the participant successfully set a goal. Heuristic violated: Visibility of system status	3		After the user successfully set a goal, we will take the user to a page that compares the history average to his/her goal.
	The participant didn't know what the slide bar means in the goal setting page. Heuristic violated: Help and documentation	2	(no image)	We added some text on that page, but later we decided to delete this page, because we don't think it is necessary to let the user choose another goal other than the suggested one.
	The participant was not sure if he could click on the icon on the home page.	1		We added arrows to indicate that clicking on this will take the user to another page. We also updated the navigation pictures to be more consistent.

	The participant were not sure about whether he wanted to maintain eye health, or improve eye health. (possibly the design should give more suggestions)	2		We changed the question to ask about eye health goals. Three choices are given: healthy focus distance, decrease blue light exposure and decrease UV light exposure. Then we can customize the settings accordingly.

Revisions Made in Response to Section Feedbacks

Original Image	Feedback	Revision	Explanation
	The goal setting page does not match the data displayed. (or the data visualization does not reflect the goal).	 (Page added)	We initially had the page where the user could set a desired eye strain level, but we got rid of it since from our first usability test, the participant did not know what to set as his goal. We added this new page, so the user knows what is being set, and also has more freedom to customize his / her goal.

			
	It's not natural that an app is telling the user "your eyes are feeling great", since the app cannot know how the user is feeling.		We changed the text to "no eye strain detected", so the wording is more objective. Also, we chose a smaller eye icon, for aesthetic purpose.

Second Usability Test

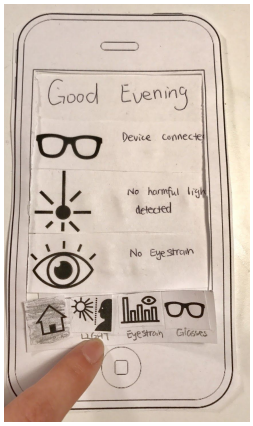
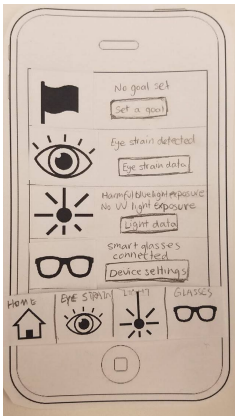
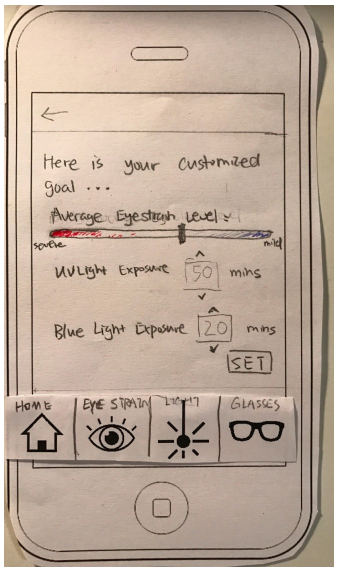
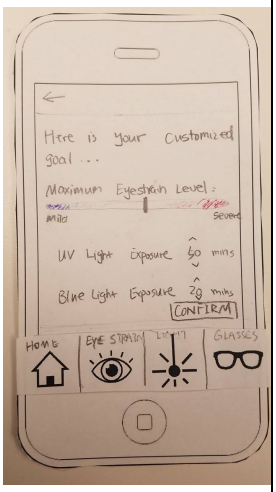
Our second usability testing participant was Lily. We picked her as our participant because she is nearsighted and spends a handful amount of time in front of screens. The test took place in lab 003 in the CSE building. We chose this place because our participant was working in this lab and she did not want to go too far away from her working space.

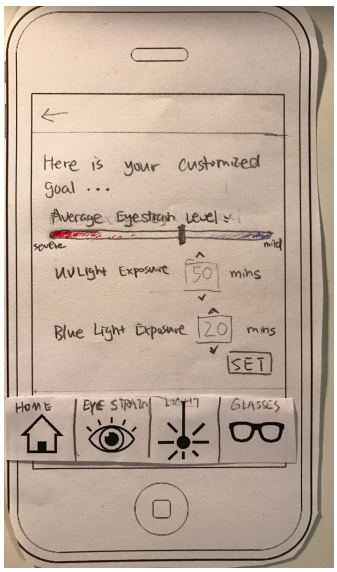
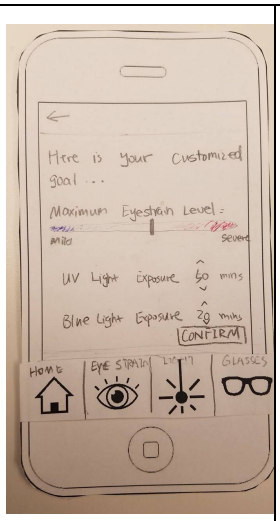
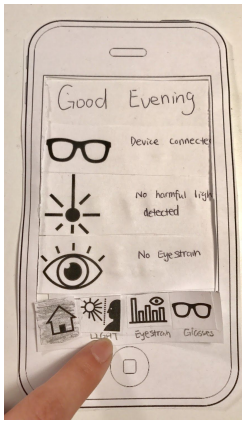
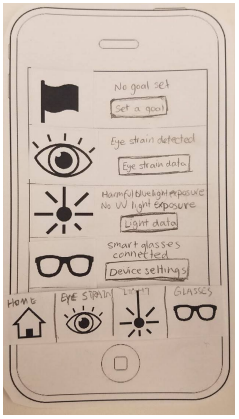
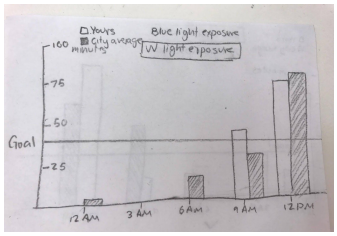
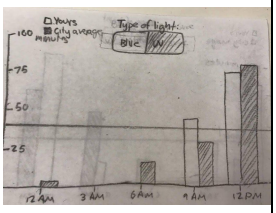
We assigned two tasks to her. The first task is similar to the one we assigned to Michael. The scenario is that she comes back from eye doctors visit, and she wants to set a goal to have less eye strains. We choose this task because we want to make sure our previous fixes are effective. The second task is to find when she had the most UV light exposure on a particular day (in this case, it's February 14th).

Before we began, we first briefly introduced our project. We told the participant that our design is a smart glasses + smartphone app combo intended to help customers alleviate their

eye strain problem, then we told her to try to set a goal for her eye strain level and let her try the app on her own without telling her any additional information (e.g how to use the app, etc). In addition, we told her she should “think aloud” as she accomplishing the two tasks. During the process, she got stuck on the data visualization page, instead of telling her what to do, we reiterated the task and gave her some hints. We also asked her for feedbacks after we finished this usability test.

The role of each member: Alexis acted as the observer/note taker, Cynthia acted as the computer, and Chris acted as the facilitator.

Image	Incident Description	Severity	Revision	Explanation
	Home page is not clear; you don’t know if the items are status or calls to action	3		We clearly separated the status and call-to-action items on the home page
	Goal slider is oriented incorrectly	1		We reversed the two sides of the slider. Now severe is on the right, and mild is on the left.

	Average eyestrain level -- wording is confusing	1		We changed the word ‘average’ to ‘Maximum’. That way it makes it clearer to users that this the goal is to keep their eye strain level below this value.
	It’s hard to learn how to set a goal on the first time using the app, or even that you are supposed to. The participant couldn’t figure out how to go to the goal setting page.	3		On the home screen, while no goal is set, the user will be prompted to create a goal
	After you click the time data of UV/blue light it’s confusing what kind of light you were looking at. Lily couldn’t figure out how to display UV light exposure, when she is looking at the blue light data	3		Toggle switch is made more visible and uses a more conventional design.

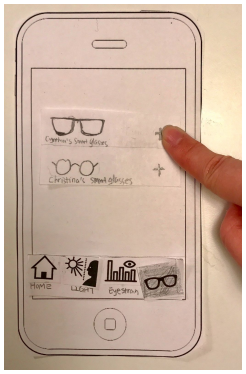
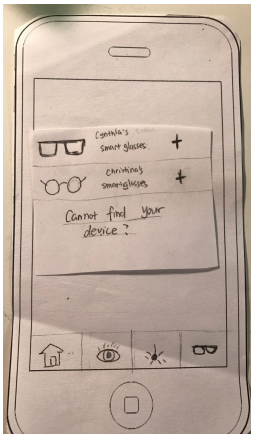
Third Usability Test

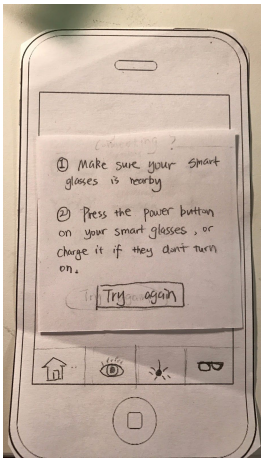
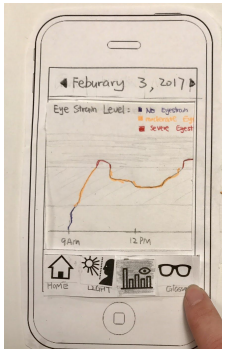
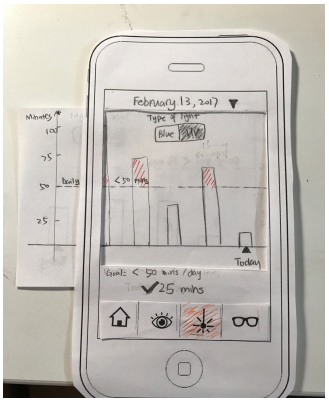
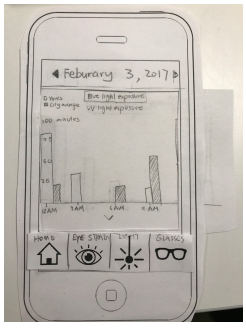
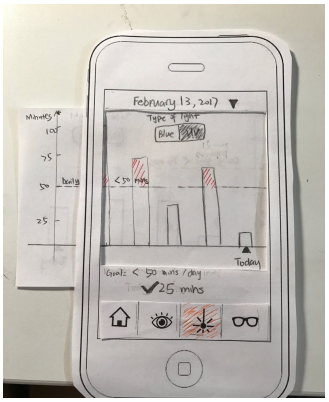
The third participant is Joseph, a CSE undergraduate student. We picked him as a participant because he is currently having eye strain problem which may lead to a potential decrease in eyesight. The test was conducted in the CSE lab 003, because it the participant did not want to go too far away from his working space.

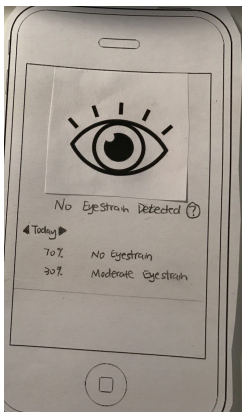
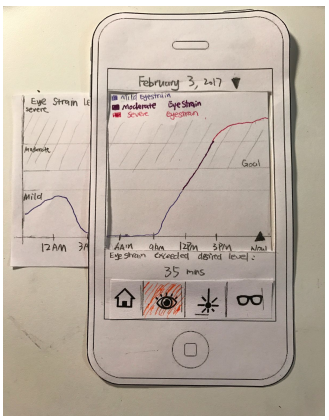
He was assigned two tasks. The first scenario is that he has a huge project due tomorrow and he needs to work on it. But his smart glasses keep telling him he needs to take a break, so he wants to disable this alert. The second scenario is he has already set a goal on this app, and he wants to see whether he has met his UV light exposure goal last week.

The participant was asked to perform both tasks. We first explained what our project is about and then presented him the home page of our app. Instead of directly performing the task, this participant started messing around with our app. He was trying out different options to see what all the buttons do. We did not discourage him to do that, but we did remind him of his task. Eventually he went back performing his original task and did not have many problems with this particular task. The participant was then asked to perform the second task. This time he went straight into performing the task and did not bother exploiting our prototype. He had some trouble interpret our graph. When noticed him struggling with our design, we encouraged him to speak aloud what the problem is how it can be improved.

The role of each member: Alexis acted as the observer/note taker, Cynthia acted as the computer, and Chris acted as the facilitator.

Image	Incident Description	Severity	Revision	Explanation
	Smart glasses had names on them but the participant wasn't named that. In addition, it's not clear what to do if the user's device is not displaying, which violates the help and documentation heuristic.	3		A new button "cannot find your device" is added, so the user could see some suggestions on what he/she should do if he/she is having trouble connecting the device.

				
	The user was not sure if he could click on the date to show data by week.	2		Change the two arrows to a drop down button.
	The user thought the two bar graph one means UV light and one means blue light, but it should mean the city average exposure and the person's exposure.	3		simplified the visualization page by removing the bars for city average, and comparing only to the user's goal.

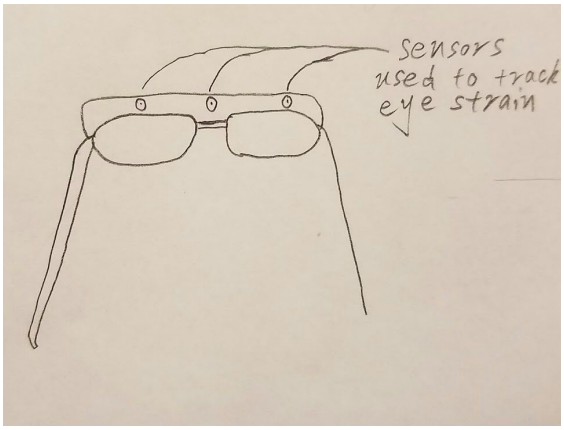
	The user was tempted to click on the eye icon in the data visualization page. He also mentioned that this icon is too big.	1		We felt like the eye icon is unnecessary, since it does not provides the user any informations. As a result, we removed the old page, and instead of the icon, a graph is now displayed.

Overview of Paper Prototype:

Two Primary Tasks:

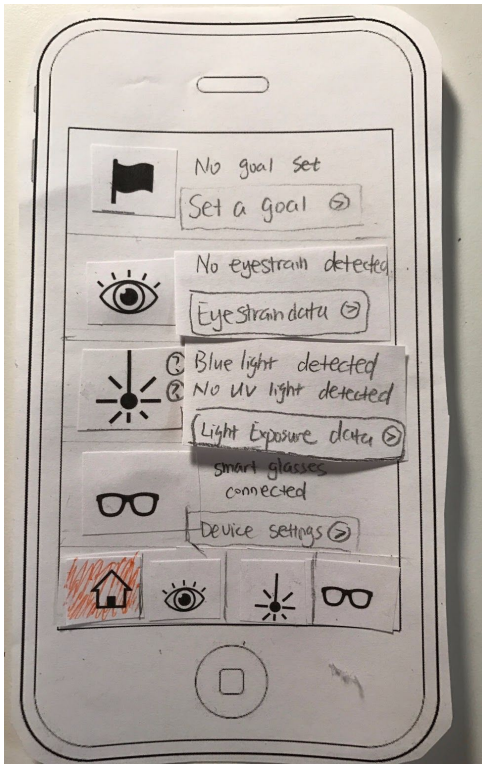
Task 1: Reduce Harmful Light Exposure

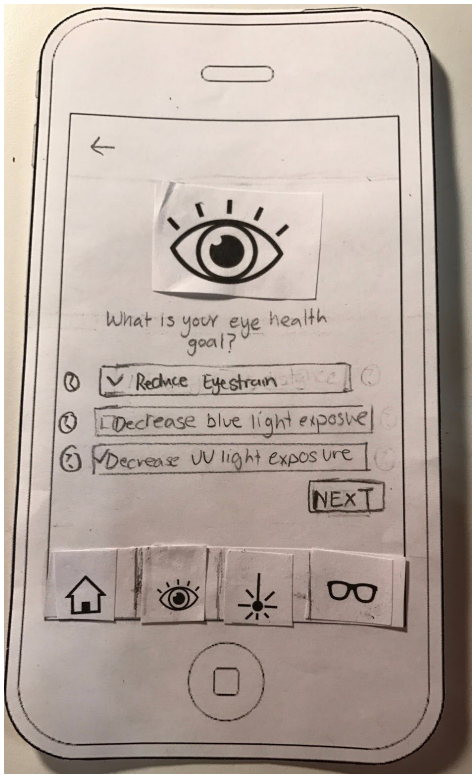
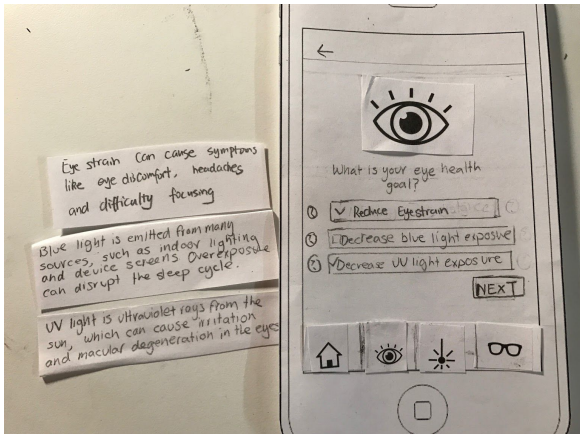
Smartglasses

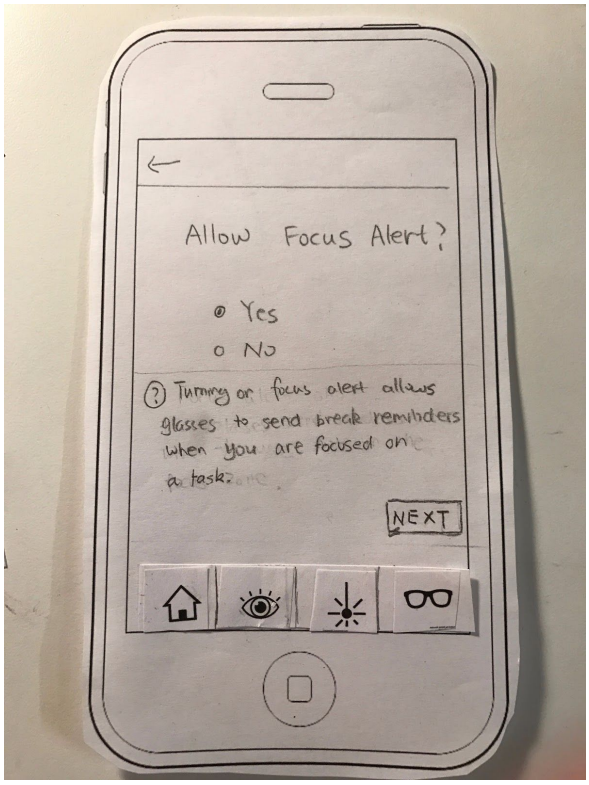
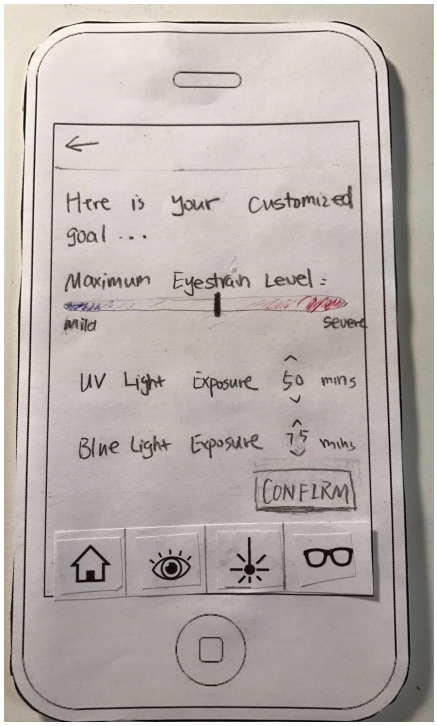
	The tint of the lenses will automatically be adjusted to filter out UV light and blue light. Users could turn off this feature if they are doing color sensitive work.

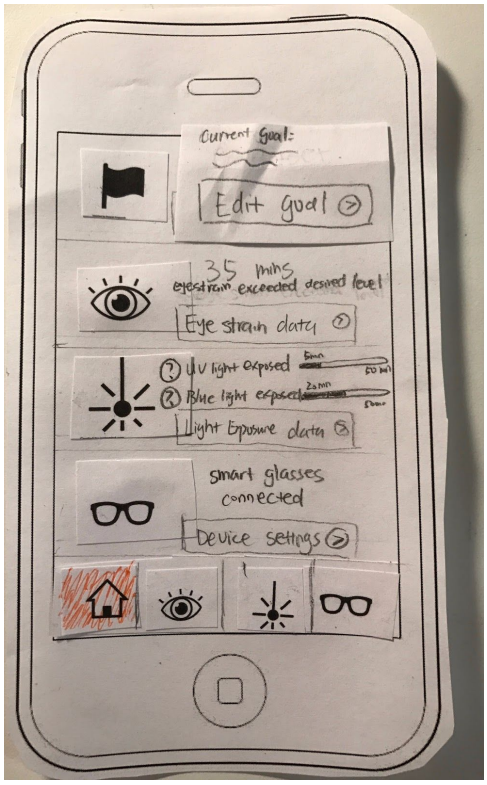
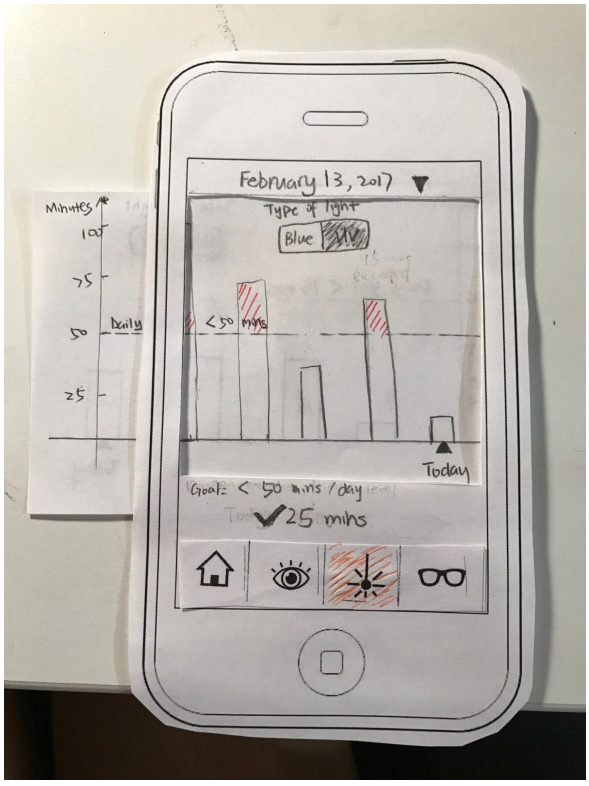
Smartphone App

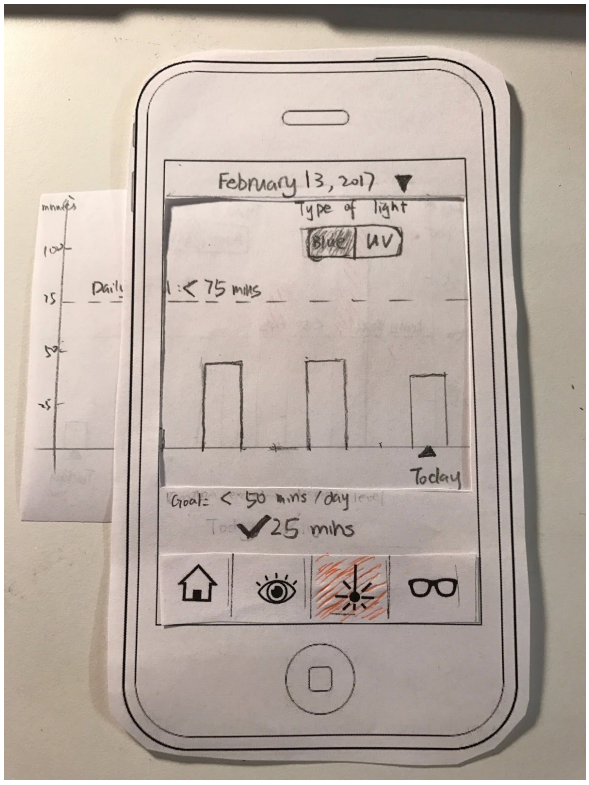
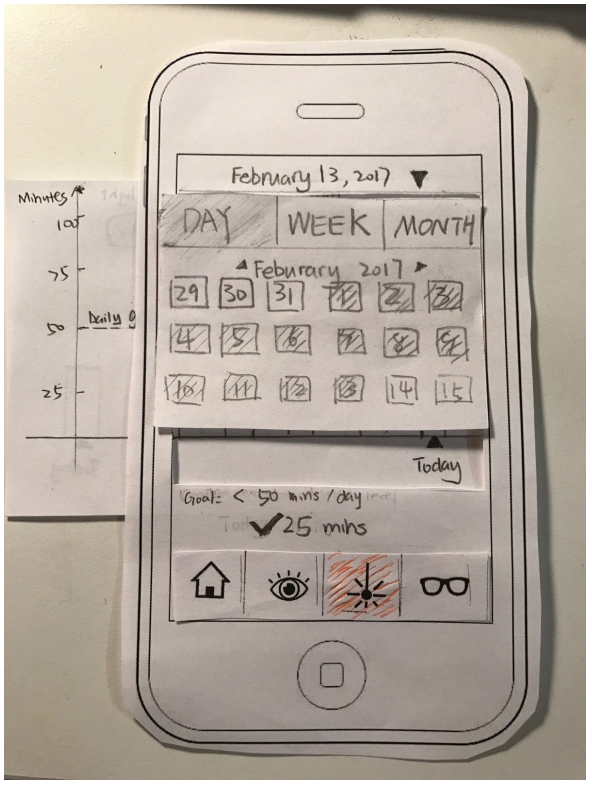
In order to reduce harmful light, people might want to know how much UV or blue light they are exposed to everyday. They might also want to set a goal.

	Enter the home page. Without any goal been set, the second and third grid display whether eyestrain, blue light, UV light is currently detected. Step 1: Click on “set a goal” button.

	The user can choose from three eye health goals -- reduce eyestrain, reduce UV light, and reduce blue light. The user can also choose multiple of them. If the user is not sure what these terms mean, he/she can tap the question mark next to each choice. Step 2: Click on one of the question marks.
	Explanations on why we should reduce eyestrain / blue light / UV light. Some common symptoms are also shown to give the user some incentives on improving eye health. Step 3: Click on “NEXT”

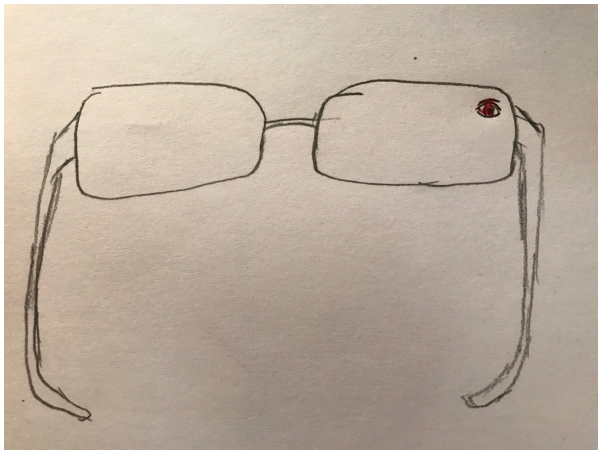
	The user can set whether focus alert is allowed. (this feature focus alert will be explained in the next task). The question mark below explains what it is. Step 4: Click on “NEXT”
	This page shows the automatically generated goal, based on the user’s previous choices. The user could also modify it. Step 5: Click on “CONFIRM”

	Go back to the home page. Now the second and third grid compare today's data to the user's goal. Step 6: Click on "Light exposure data"
	A bar graph is shown, indicating the minutes of UV light exposure this person has had on a particular day. Today's data is on the rightmost column. User's goal is also displayed. The bar graph will be red if the user has exceeded the desired amount of UV light. At the bottom of the graph, it tells the user how much time he has been exposed to UV light today, and whether he's met the goal. Step 7: Toggle the top switch from UV to Blue.

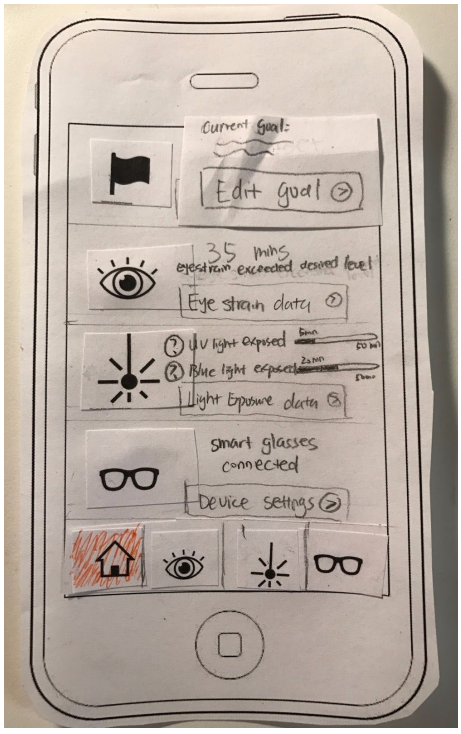
	A bar graph is shown, indicating the minutes of blue light exposure this person has had. Similar color codes as the UV light graph. At the bottom of the graph, it tells the user how much time he has been exposed to blue light today, and whether he's met the goal. Step 8: Click on the drop down button next to the date.
	The user could also view the data on a different date, or view the data by week or by month.

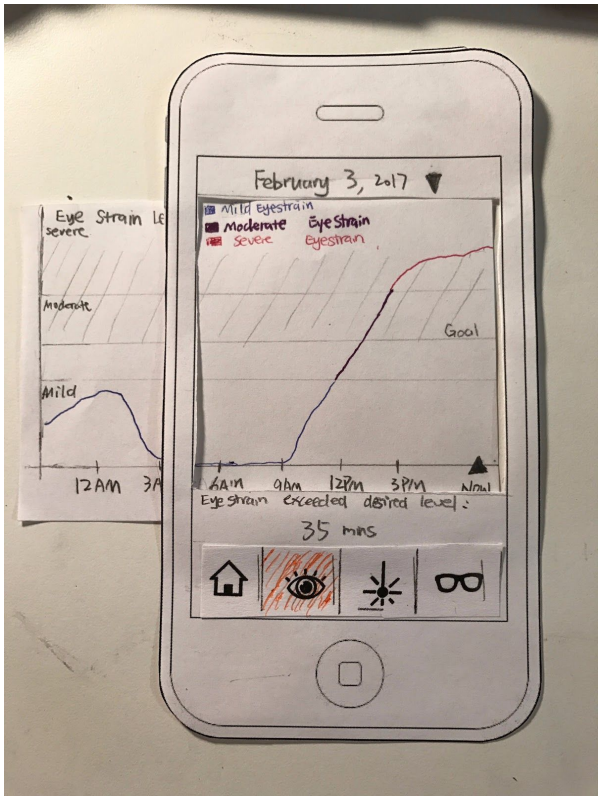
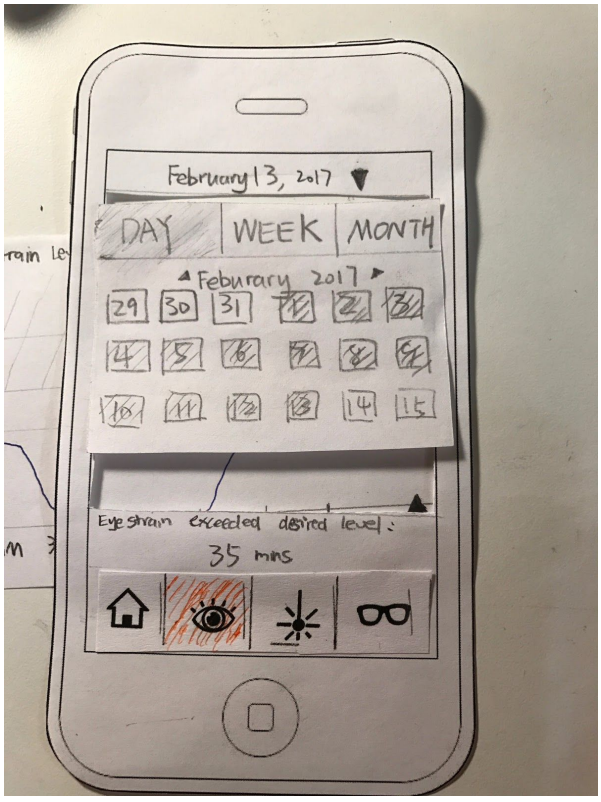
Task 2: Reduce Eyestrain

Smart glasses

	If focus alert is enabled by the user, when the user is not focusing and has eye strains, the right corner of a lens will displays an eye icon to indicate that the user should take a break. The color of this icon will get redder and redder as the eye strain level progresses.

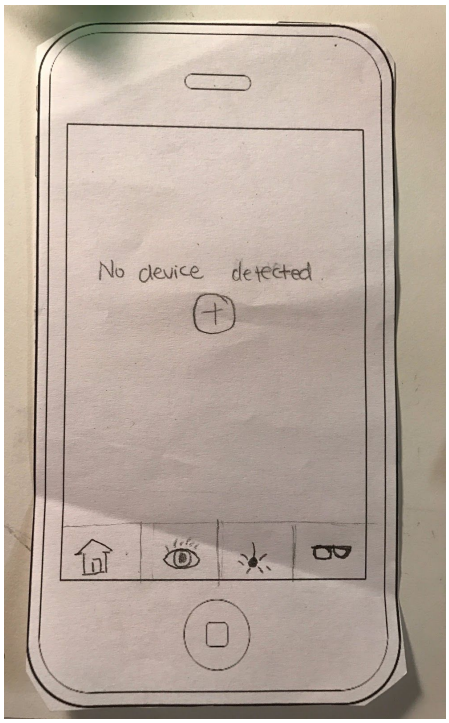
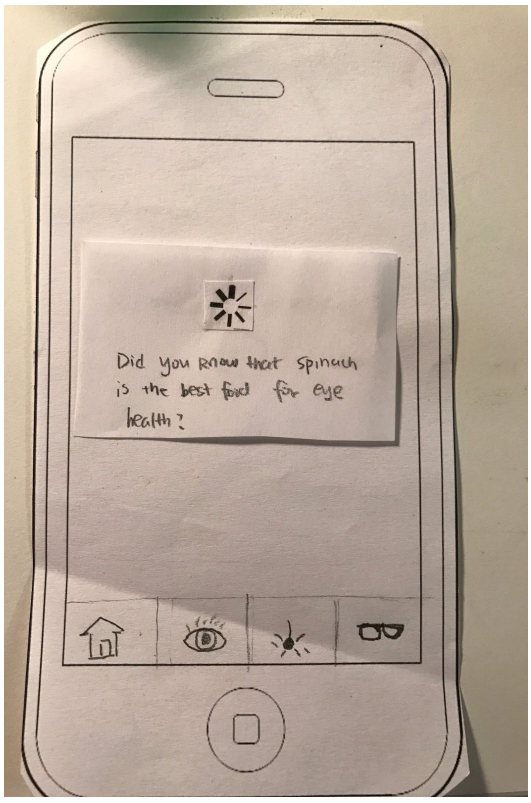
Smartphone app

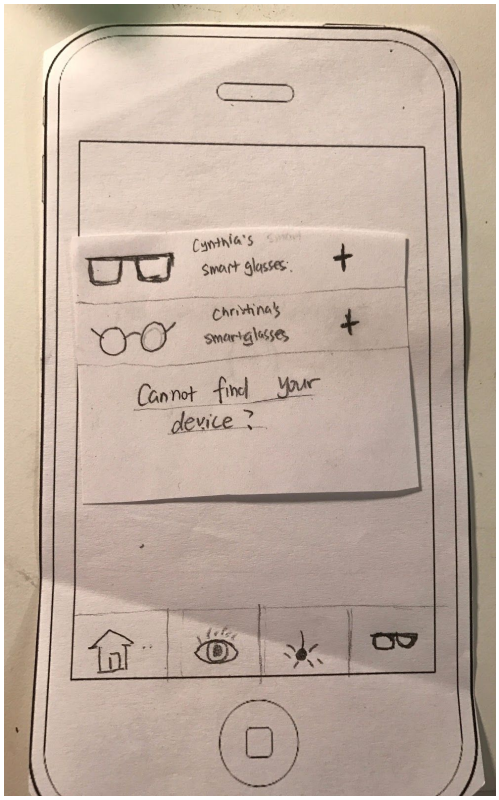
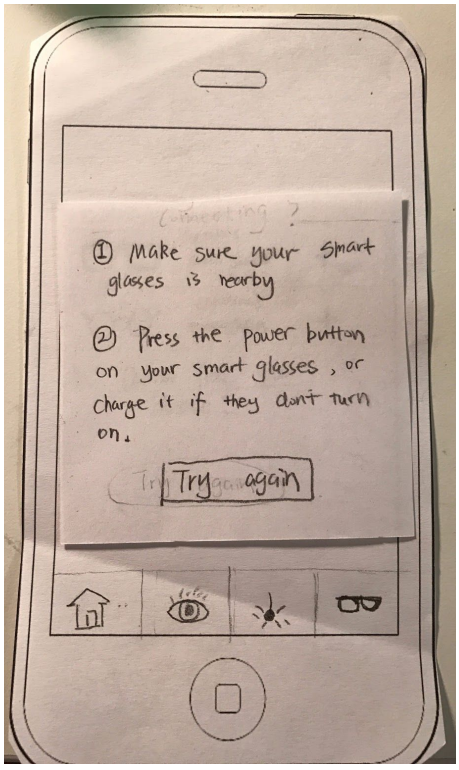
	Enter the home page (this is the page when a goal has been set). Step 1: Click on “Eye strain data”

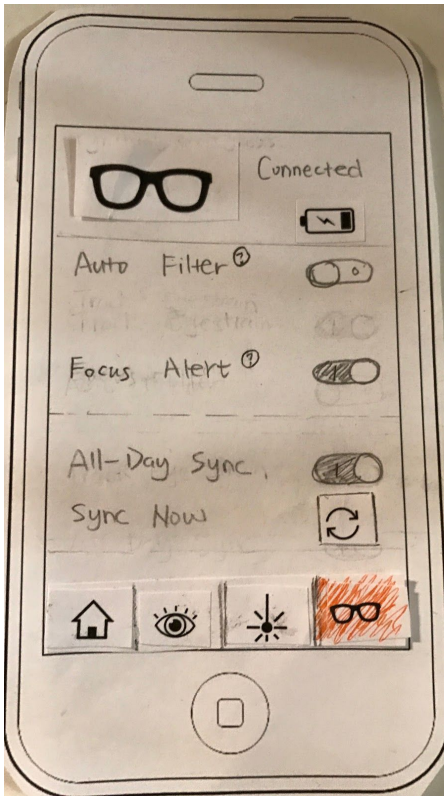
	A color coded line chart is shown, presenting the eye strain level throughout the day. Blue means mild eye strain, purple means moderate eye strain, and red means severe eye strain. At the bottom of the graph, it tells the user how much time his eye strain exceeded the desired level. Step 2: Click on the drop down menu next the the date.
	The user could also view the data on a different date, or view the data by week or by month. Step 3: Click on the drop down button next to the date.

Implied Task:

Setup the Device:

	Step 1: Click on the add button
	Display some eye health tips while it's searching for devices. Step 2: nothing

	Display nearby available device. User can click on “Cannot find your device” if his/her device is not detected. Step 3: Click on “Cannot find your device”
	Show possible solutions if the user’s device cannot be found. Step 4: Click on “Try again”

	After the device is correctly connected, we will go to the settings page, in which the users could enable/disable some features of the smartglasses.

Discussion of Key Revisions in Design Process

1. **Home Page**
   The most common feedback we received during our first two usability tests was that the home screen was unintuitive. The reason for this is that our previous home screen design had three status lines, each of which could be tapped to perform actions relating to that status. A problem with this design was that it was unclear whether the homepage was just to display information or if the user was meant to interact with it as well. In addition, a large part of the homepage was occupied by a banner that said “Good Evening”, which seemed unnecessary.

   To address these issues, we redesigned the homepage to a system with 4 rows of “topics”. In addition to our previous topics: light exposure, eye strain data, and device status, we added a new topic for goals. Each of these rows still displays information about its status, but now, the home page also prompts a user to act based on this information. For example, if the user has no goals set, the goal topic will display “no goal set”, and prompt the user to set one. In addition, potential actions are brought to the forefront as a text button instead of hidden behind an arrow button. This way, the new home page provides an accessible place the user to learn about and perform the next step to achieve their eye strain goals.

2. **Goal Setting Process**

   Setting goals was a common theme in our usability tests. It's one of the most important parts of our design, since it allows people to interpret their eye strain data, and ultimately, make progress on reducing it. So it's important to make sure our goal-setting process is streamlined, and actually helps people reduce their eye strain.

   Our goal-setting process underwent several revisions through our testing process. Before this round of user feedback, the most common criticism of the goal-setting flow was that the choices the user made when setting their goal did not match the progress visualization in the app. As a result, we changed the process to allow the user to set the specific exposure limits tracked by the app for near focus, as well as harmful blue light and UV light exposure. Then we separated the goal tracking into separate pages for each of the above, so the user can track their progress and adjust their behavior based on the individual factors.

   This was a step in the right direction, but users were confused when asked to set specific exposure limits as we had not provided reasonable defaults. So we decided to bring back the checklist from our previous iteration as the first step in the process. Based on the choices the user made, exposure limits would be prefilled with recommendations, simplifying the choices the user has to make, while still allowing customization. We also made some other, smaller changes, such as setting the maximum eye strain slider from mild to severe instead of the other way around, which is more conventional.

3. **Data Visualization Page**

   The second part of improving our goal-setting process was the visualization aspect. In our goal tracking page, we had two information boxes allowing the user to track their progress for the day and throughout the month. However, users felt the text we used to describe this was too wordy. In addition, the day tracking tracked the amount of time eyestrain *exceeded* the goal, but the month tracking show how often eyestrain was below the goal. We redesigned the display to simply show a percentage of the past day or month that the goal was achieved.

   Our previous design provided a way for users to check their blue light and UV light exposure over time by swiping between two graphs. However, this feature was hard to discover. Because our graphs had two sets of bars, one for user total and another for city average, the users thought one meant blue light and another meant UV. We felt that the redesigned goal-setting process made it more useful than city average for tracking eye strain progress, so we simplified the visualization page by removing the bars for city average, and comparing only to the user's goal. In addition, instead of swiping between graphs, we opted for a more traditional design, where the user can press one of two tabs to switch between the visualizations.