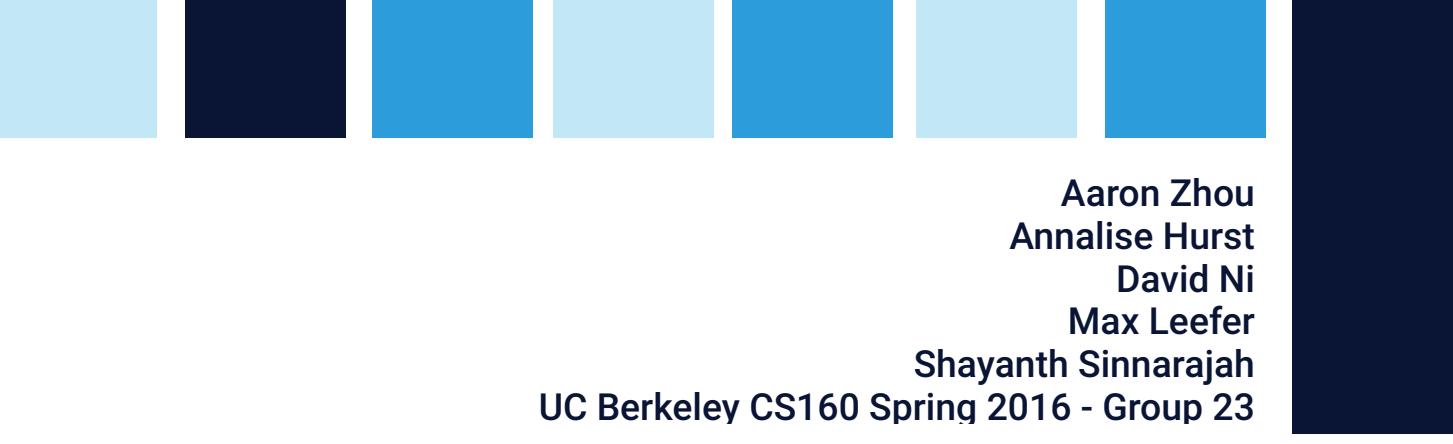


Final Report



ConQUEST

Connect, Control, Conquer.



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UC Berkeley CS160 Spring 2016 - Group 23



Project Description

Conquest engages youths with social anxiety through interaction and practice as a game. The app will present the user with quests to complete and display their progress in the game, such as level, experience, achievements, etc. The watch will prompt the user and record heart rate as they complete quests such as asking for directions when they're in a city or asking someone's name at school. It will also give them tips and reminders about the quest they are currently completing. This application will help them learn about their condition and practice engaging socially in a fun way.

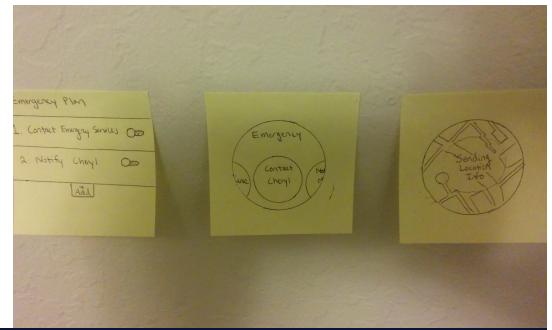
Design Process

Brainstorming

The first step of our design process was brainstorming ideas for an application that fit into the category of healthcare lifestyles. We came up with 50 ideas to choose from and then selected our three favorite. From the three remaining ideas we chose our current project idea. Our final idea was chosen for its relatively common user group as well as its potential for gamification, which is a powerful teaching tool. It also had a good incorporation of the smartwatch in a way that was central to the user experience.

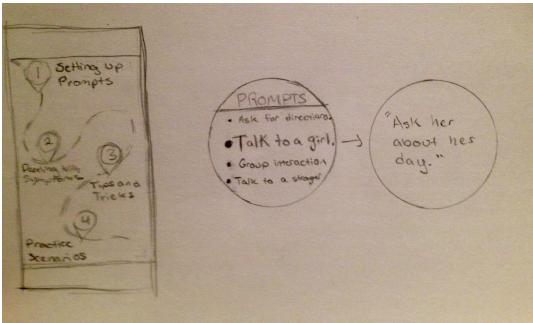
1

Personalized emergency assistance app that will notify caregivers/friends/ emergency services and provide them GPS info and other details.



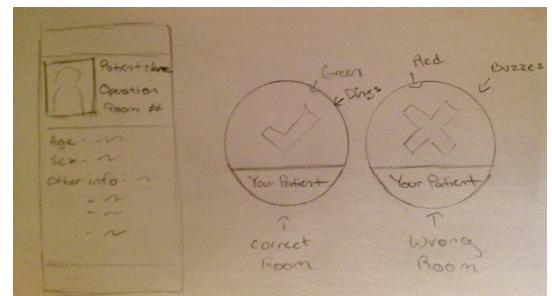
2

An app that helps kids with social anxiety disorder with prompts and practice scenarios.



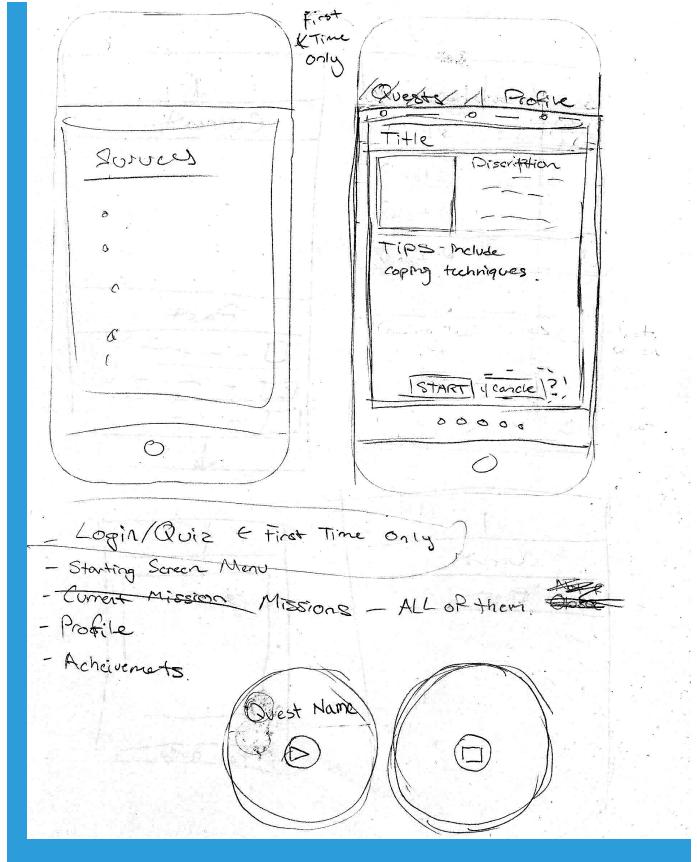
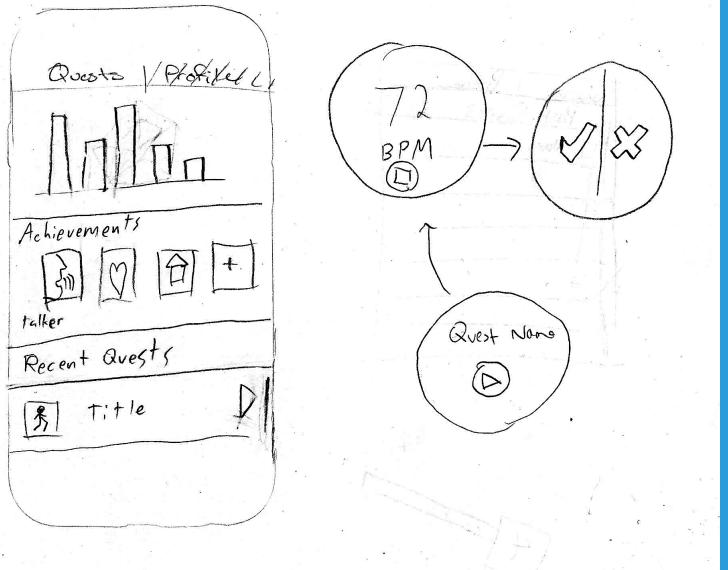
3

Wearable id for surgeons to ensure they're in the right room, and remind them of the exact procedure they're doing.



Design Sketches

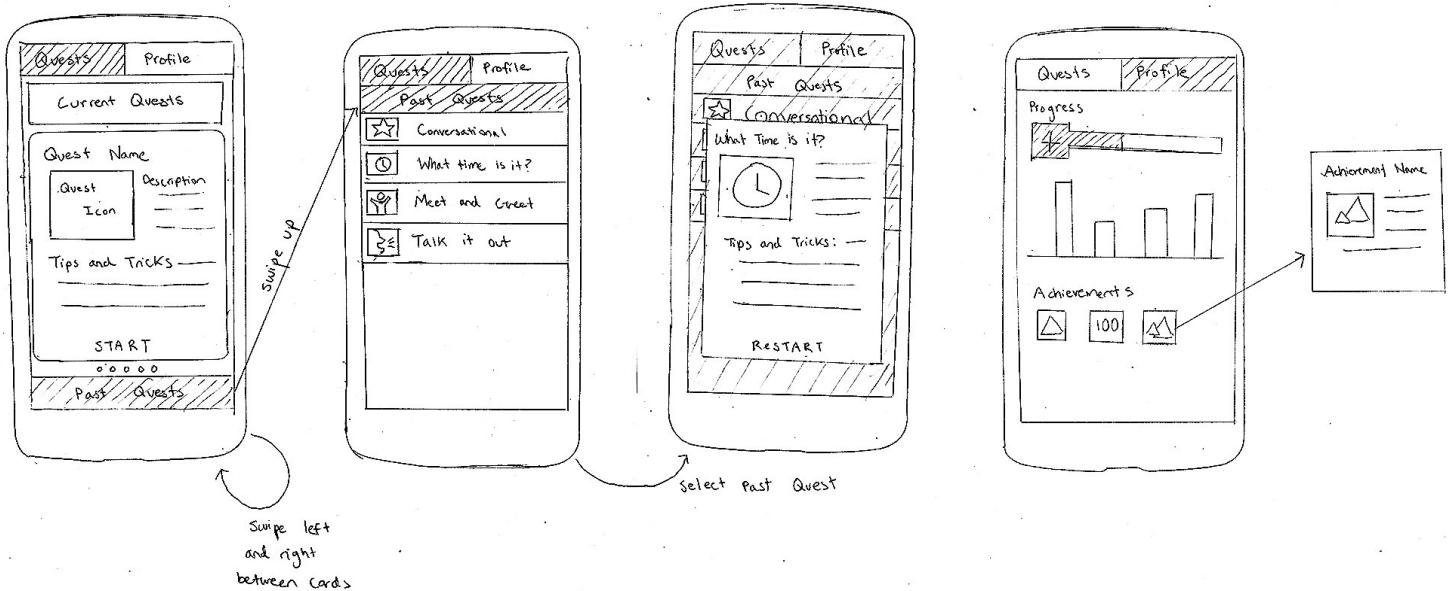
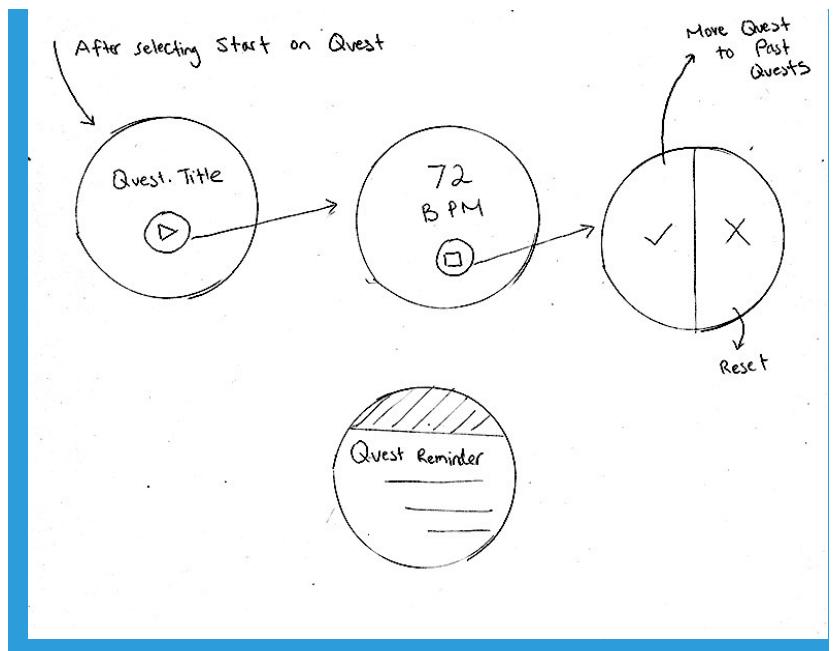
After we finalized our app idea we began sketching ideas for the mobile and watch design. We knew we wanted to have a way to view and select quests, and to have a profile to show their progress. Initially we toyed with the ideas of having a survey at the beginning of the app the first time a user accessed the app to gain information to display certain quests rather than others. In the beginning the watch design was a simple start and stop format for completing quests. Initially we didn't have a nice way to access past quests.



We then wanted to incorporate a way for the users to cancel a quest without completing it in case they felt overwhelmed. We also added the feature that the watch would display the users current heart rate as they completed a quest. Our first mock up of the profile page had the category graphs, achievements, and recent quests.



For our final sketches the navigation on the watch was heavily discussed and settled on the app opening to the current quest card view and for the past quests to be in a list view accessed from a drawer at the bottom of the screen. We decided to get rid of the survey because the users are able to select the quest they feel most comfortable with out of 5 so that allows the app to cater to their specific anxieties. Since the past quests were removed from the profile page, we added progress levels. We also designed the detailed quest view page for past quests, which had the same information as the current quests but with the ability for the user to retry the quest.



Contextual Inquiry

Interview Descriptions: Since our subjects ranged from High Schoolers to counselors to child psychologists we had to use a few different processes to conduct the interviews. For the child psychologist and counselor, we could not observe them interacting with a child with social anxiety disorders because it would violate doctor patient confidentiality and they were too busy to speak with us in person. Therefore we conducted those interviews over the phone and asked them to walk through their process with us as if we were children with social anxiety disorders. We met with the high school student at a local coffee shop in a neutral zone so that she would feel comfortable. We asked her questions about how she felt while in class and at home. Every time she answered a question, she presented as if she was in the classroom and explained her experience of the times where an awkward moment would induce a panic attack. We also asked how often she felt panic attacks that were induced by social anxiety disorder. She had a great understanding of her disorder and wanted to find ways so that she could feel more comfortable answering questions in class. The high school student is looking forward to not only being able to gain confidence via our application, but also learn new ways to cope with panic attacks.

Tasks and Themes in Common: Both the child psychologist and counselor touched on the theme of having kids with anxiety be aware of their mental state and rate their experience as they encounter stressful situations and perform calming procedures. Another theme was including rewards for accomplishing tasks and possibly sharing these successes with others (through social media or some other method). It is important for kids to go through this process of facing their anxiety with a support group for encouragement and trust. The high school student touched more on her personal perspective on social anxiety disorder. We were able to get an inside look as to how a person who has social anxiety disorder copes with their panic attacks. In agreement with both the child psychologist and counselor, the high school student found that a reward system would be extremely beneficial in helping a person overcome social anxiety.

Subject 1:

The child psychologist stressed the importance of having children choose which situations are more or less stressful to them because something that is not very stressful to one child can be very stressful to another. She suggested what we allow for customization for the user. Since she works with children in a hospital setting which has many resources at its disposal, she is very focused on gathering information about the children in order to use the best treatment available for them. She was also believed that we should take advantage of the smart watch's ability to measure heart rate to give instantaneous feedback for how different coping techniques are affecting the child's body as they perform them.

Subject 2:

The counselor highlighted the importance of self-evaluation and motivation. The first step a subject takes before talking to a counselor involves identifying the problem as an obstacle to his or her goals. Mindfulness is key to overcoming the disorder. A subject should be aware of his/her thoughts and physiological state, recognize that the physiological activation caused by social anxiety is not physical pain. A subject should also explore how to relieve symptoms, which can vary from breathing exercises to medication. In order to explore a his/her own mindfulness, the subject should participate in incremental small social exercises, stopping frequently to apply calming procedures.

Subject 3:

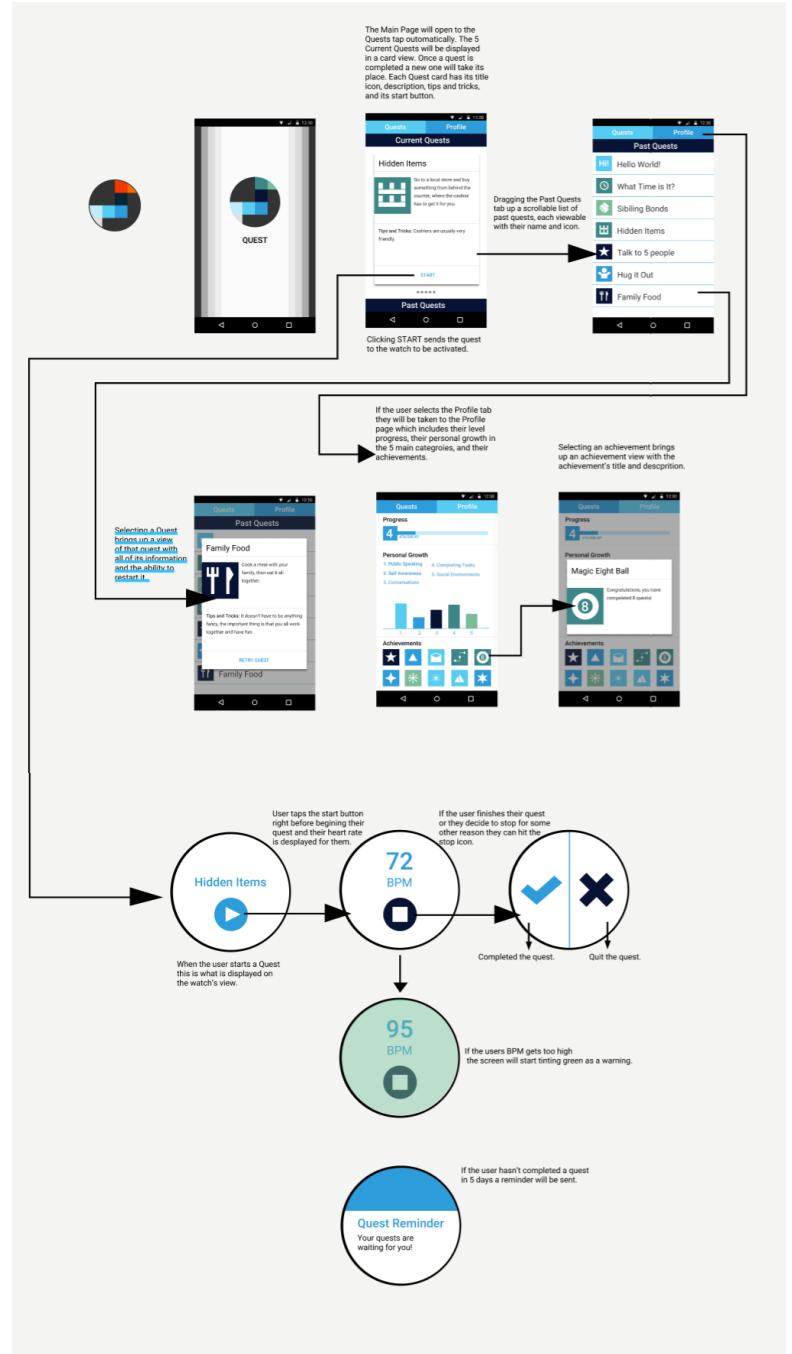
The High school student stressed the importance of letting the user know when he or she may be experiencing a panic attack. She also mentioned that she would love to have some informative push messages to her watch or device to let her educate her on the disorder. Additionally, she also loved the idea that the application will trigger a warning to the end-user when it senses the onset of a panic attack, whether it is triggered via an elevated heart rate or increased perspiration. Lastly, she is also looking for alternative methods to reducing her heart rate after a panic attack, because regulated breathing does not always work for her.

Wireframes : First Iteration

After our initial interviews and subsequent honing of how we planned for users to interact with our application we started designing the wireframes in Figma. After our first iteration we performed user testing which we used to inform our changes for the second iteration.

First Iteration:

For our first wireframe iteration we stayed very close to our final sketches. We added in the screen for the achievement detailed view based of the view for past and quests to keep consistency. We also decided to write out the categories above the graph to make it more clear and understandable. For the watch we added in a screen for when the heart rate gets too high, and it starts flashing green to alert the user. While doing the wireframes we chose a color scheme of blues and greens to make the user feel confident, calm, and to symbolize growth.



User Studies

After developing our wireframes it was time to test out our applications with potential users. We selected two high schoolers to interview had them try to complete our apps three primary tasks. We would tell them the situation they were in and the task they were trying to complete and listen to and watch them as tried to figure how to complete the task. They were requested to say their thoughts and actions out loud for us to take notes on. We then synthesized each of the interviews into strengths and weaknesses the interviewee felt our app had.

Three primary tasks:

Choose a quest.

Complete a quest.

Check Progress.

Subject 1:

Female,
High School Student,
Age 16

Subject 2:

Male,
High School Student,
Age 14

Strengths:

- Liked the visuals of the application, particularly with regards to the profile screen and icons.
- Liked the mobile-side interaction flow.
- Most of the processes were simple and fairly intuitive.

Weaknesses:

- The watch portion of the application is fairly weak compared to the mobile portion.
- There is a bit of a strange gap between starting a quest, then suddenly being presented with a screen just showing your heart rate.
- The quest completion screen requires more information for first time users to understand what the screen's purpose is.

Strengths:

- Swiping and scrolling through quests was easy for them.
- Liked the categorical rating system.
- Thought the achievements were cool, and that the icons for both the achievements and the quests looked good.

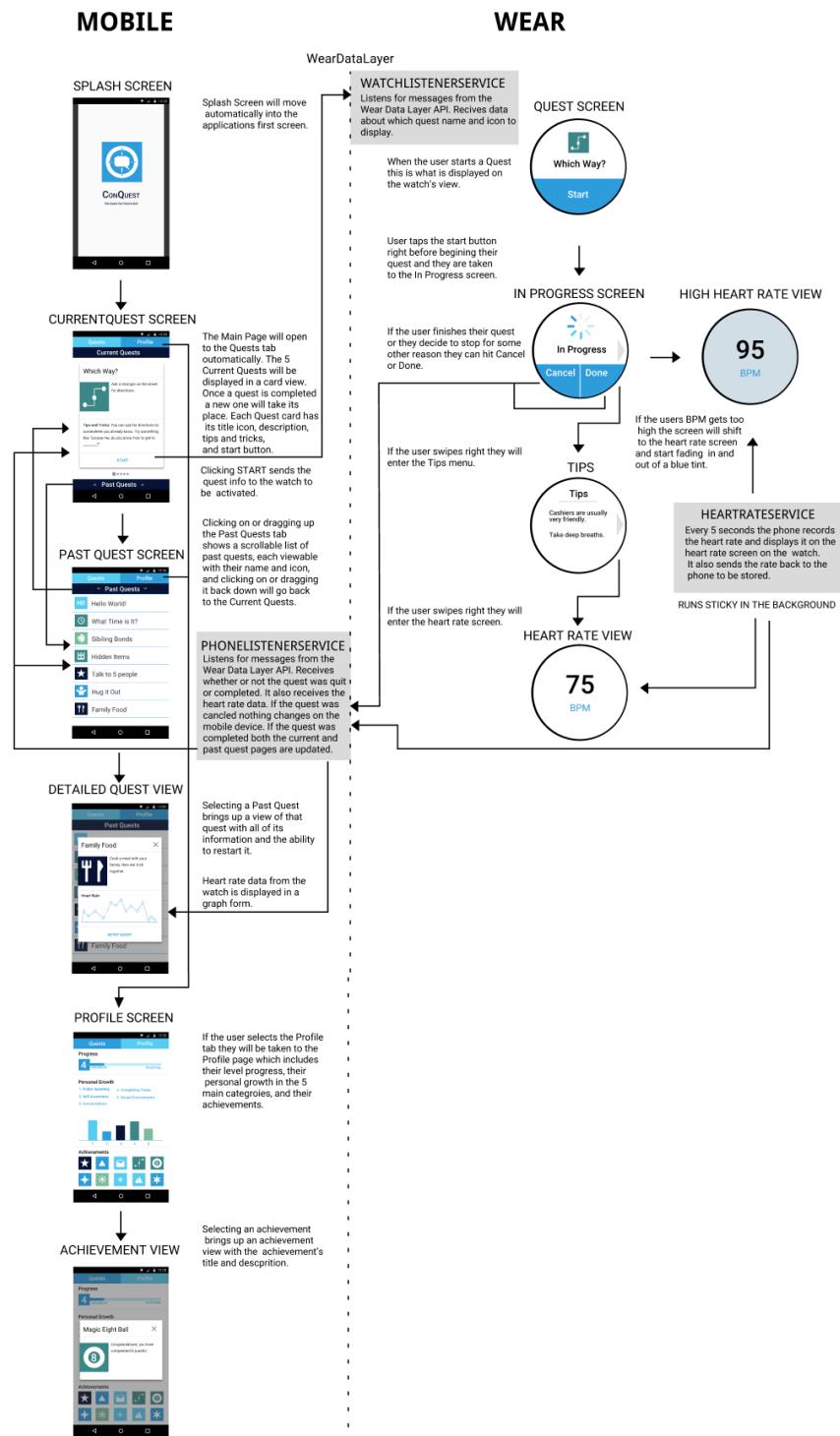
Weaknesses:

- They were confused about what some things did, especially on the watch.
- Past Quests was hard for them to get too and they couldn't find how they did on quests.
- They were confused about how finishing quests accurately models completion.
- The fact that there was no way to tell how they did on quests was a downside for them.
- They felt that the watch screens were a bit bare.

Wireframes : Second Iteration

Second Iteration:

Based on our user testing we learned that users generally liked the mobile portion of our app especially its graphics, so we kept most of our mobile design the same. The main change we incorporated was included the recorded heart rate in the past quest detailed view because the users wanted to know how well that had done on their quest. We also added some small navigational cues such as x's in the corners of the pop up boxes. For the watch we learned that it was very confusing for the users to navigate, they were uncomfortable with the heart rate displaying right away, and they wanted more information on the watch. To address these concerns we added the quest icon to the watch quest screen, added an in progress screen with clear candles and done buttons, added tips to the watch, and moved the heart rate view to a slide in a 2D picker that also contained the tips screen.



Competitive Analysis

To evaluate how our app fit into the current market, we performed competitive analysis with three other apps similar to ours.

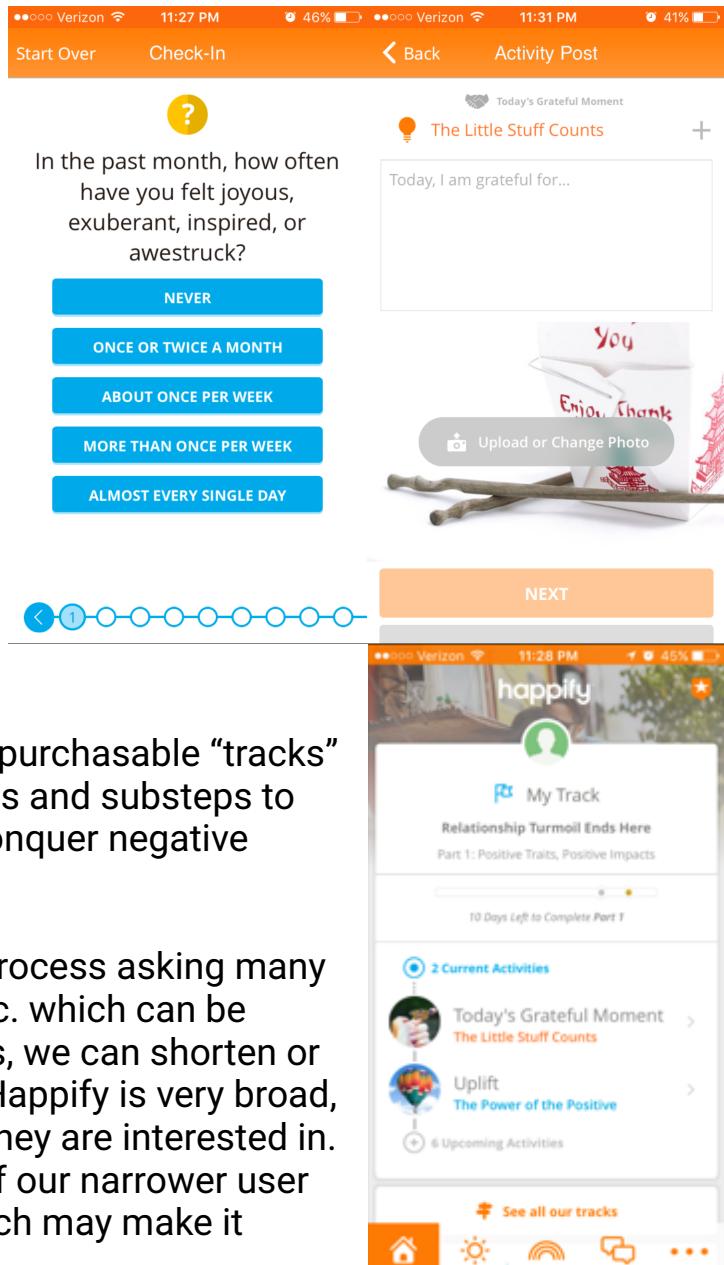
Happify

Happify uses games and activities to reduce stress and anxiety. It allows users to buy tracks which describe steps to take to eliminate stress. Our app is targeting a younger audience and a narrower set of goals. We are providing actionable steps to reach specific social goals.

Target User Group: People who suffer from stress and other negative emotions. We are focused specifically on social anxiety disorder and not stress in general.

Functionality: Provides a series of free and purchasable “tracks” for users to follow. Each track includes steps and substeps to achieve goals such as “relieve stress” or “conquer negative thoughts”.

Usability: This app has a long onboarding process asking many questions about age, relationship status, etc. which can be daunting. Since our app is narrower in focus, we can shorten or skip this procedure. Because the scope of Happify is very broad, it might be difficult for users to find tracks they are interested in. We are able to be more accurate because of our narrower user base. There is also a paywall in the app which may make it inaccessible to some users who need it.



Link: <https://itunes.apple.com/us/app/happify-science-based-activities/id730601963?mt=8>

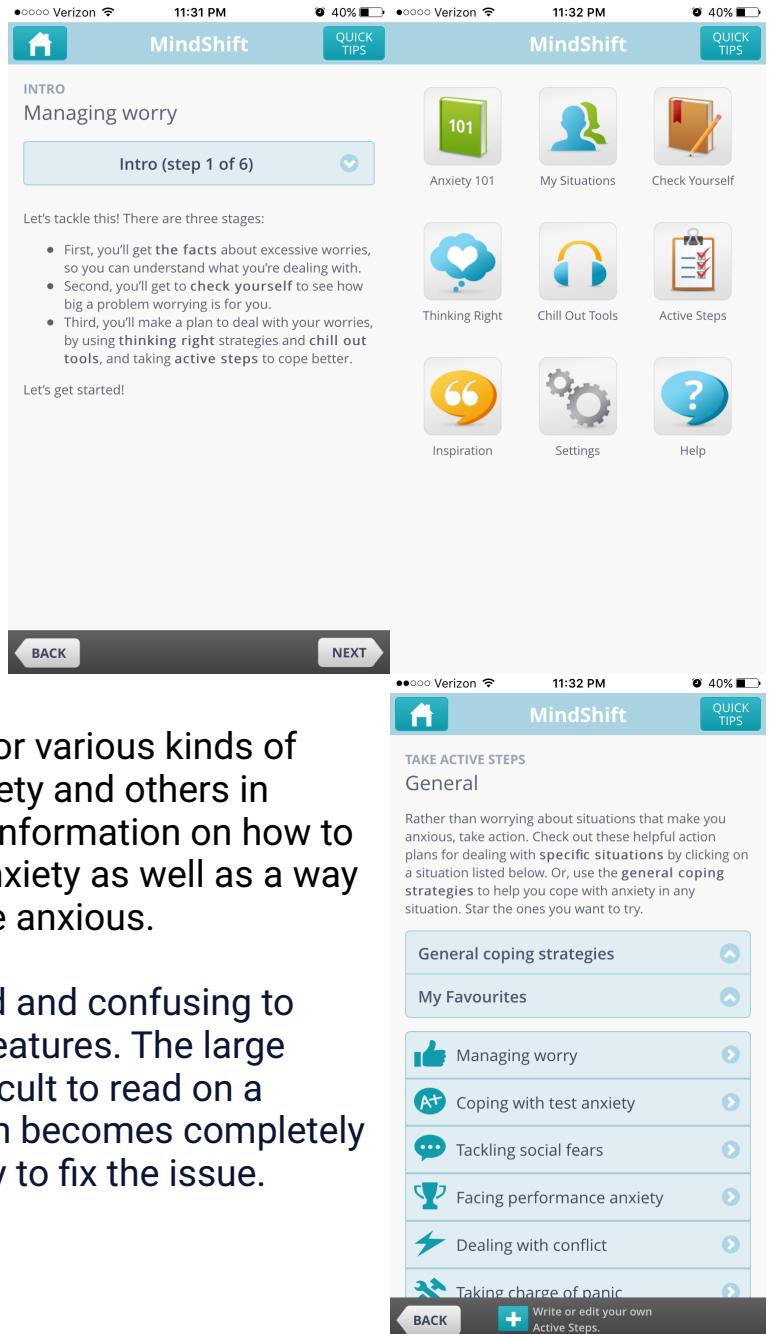
MindShift

Mindshift is an app designed to inform people with anxiety about steps to fight it. It provides information about anxiety and various tools to keep track of improvement. Our app is not meant to teach about anxiety but to provide concrete steps for self improvement.

Target User Group: Teens and young adults who suffer from anxiety. Ours will also be focusing on this target group.

Functionality: This app gives strategies for various kinds of anxiety which includes performance anxiety and others in addition to social anxiety. The app gives information on how to overcome situations which may cause anxiety as well as a way to record events in which the user became anxious.

Usability: The app is very slow to respond and confusing to navigate because it is providing a lot of features. The large amount of text is daunting and often difficult to read on a smartphone. Occasionally, the app screen becomes completely blank and killing the process is necessary to fix the issue.



Link: <https://itunes.apple.com/us/app/mindshift/id634684825?mt=8>

Smiling Mind

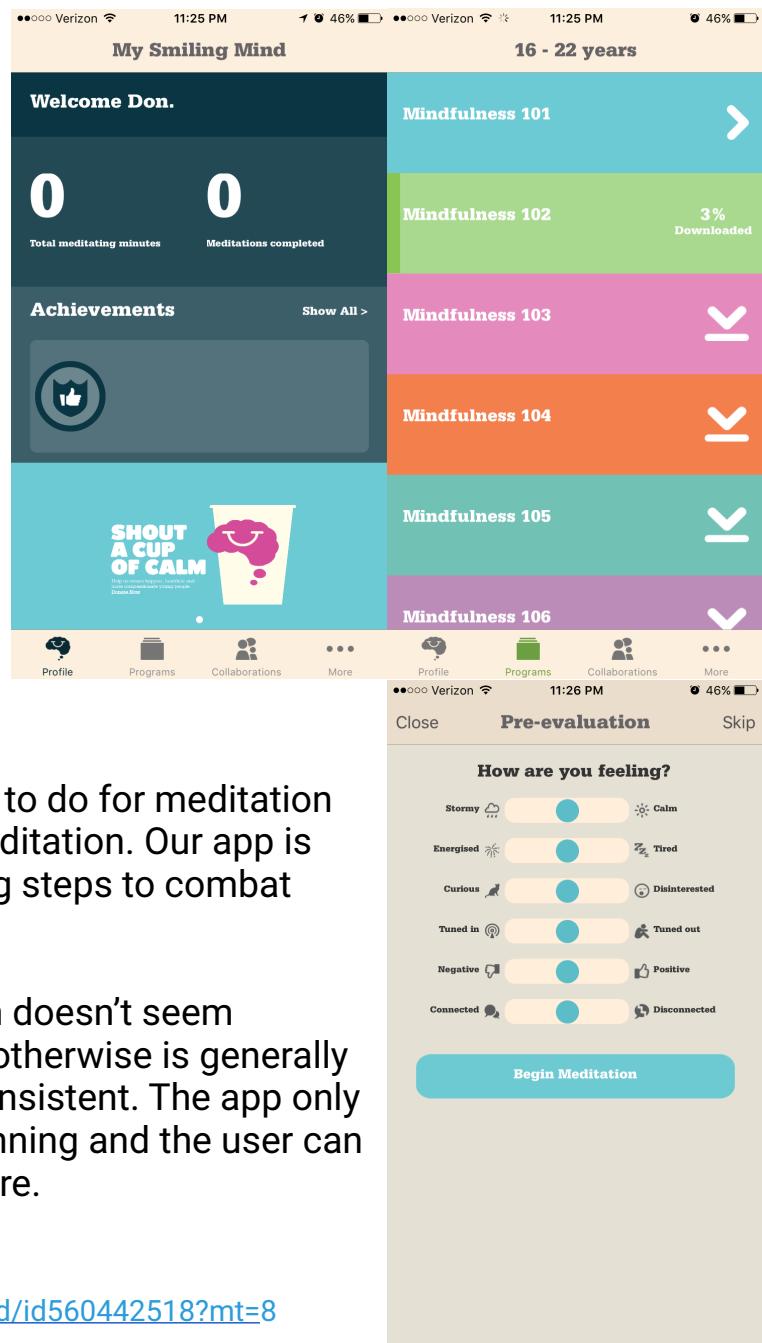
Smiling Mind is a meditation aid primarily for younger people, but also includes content for adults. There are voice lessons teaching meditation and achievements to reward following the app. We are not using meditation, but we will have a similar list of achievements for using our app.

Target User Group: Youth and adolescents who are stressed. We are focused specifically on social anxiety disorder and not stress in general.

Functionality: There is a list of exercises to do for meditation and provides music and narration for meditation. Our app is not about meditation, but about providing steps to combat anxiety.

Usability: App requires an account which doesn't seem necessary. Font is slightly too small but otherwise is generally well designed. The color scheme is inconsistent. The app only has one section downloaded at the beginning and the user can choose to download the others they desire.

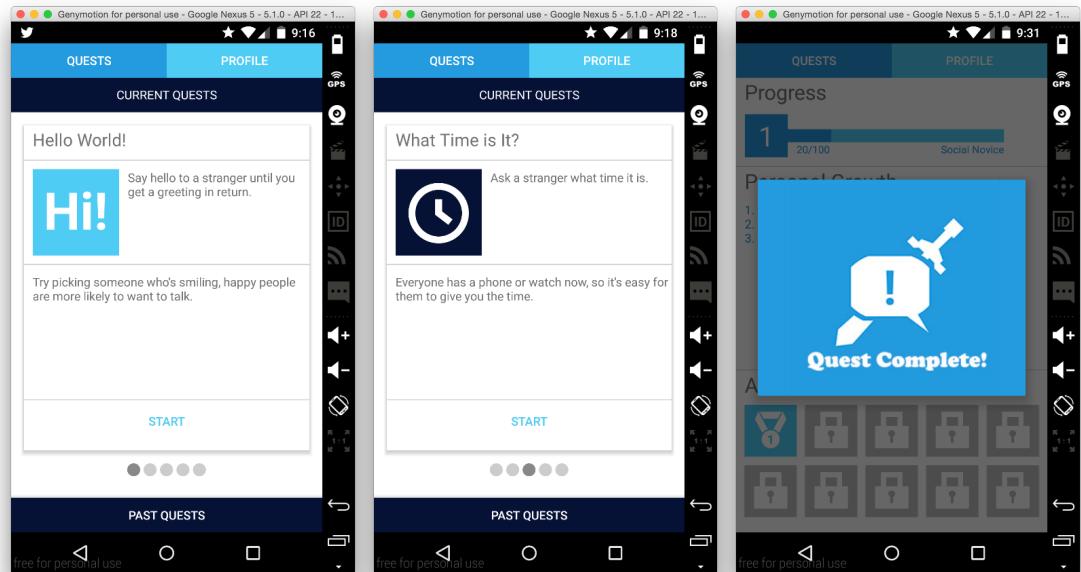
Link: <https://itunes.apple.com/us/app/smiling-mind/id560442518?mt=8>



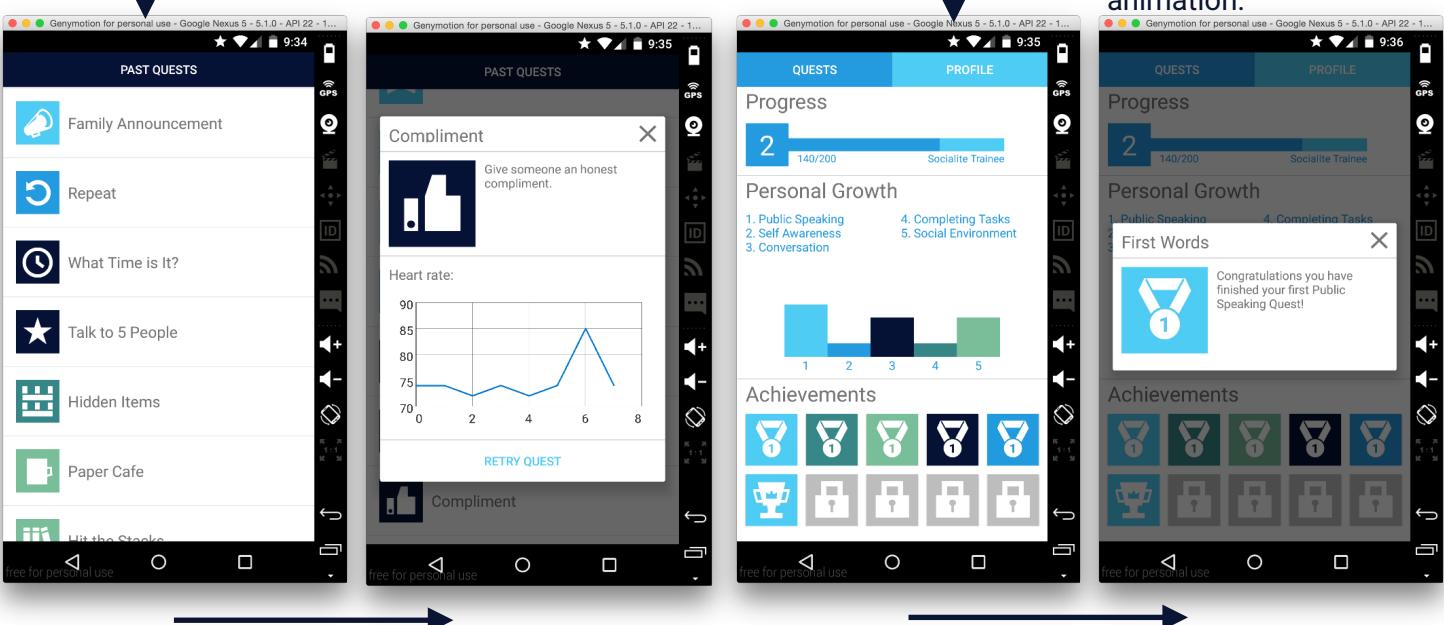
We are strictly targeting high school students in our app, which is narrower than all others we compared against. The distinctive feature of our app is that we are encouraging our users to proactively approach situations which may be uncomfortable. All other apps seem to be more reactive and are designed to help the user manage being in a situation that may cause anxiety. We will also be the first app to integrate the smartwatch and provide immediate contextual responses based on heart rate.

Final Design

After completing multiple iterations of the design cycle we landed on our final design.

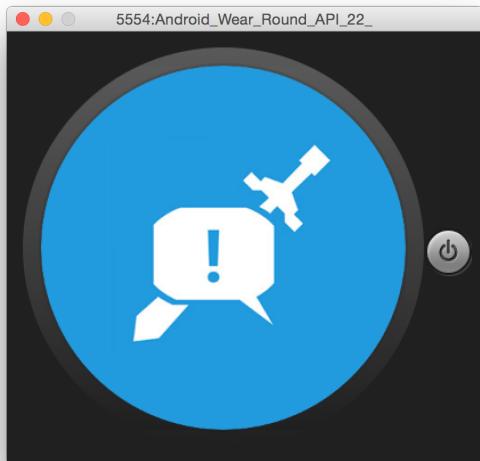


The current quest tab hold the current quests and their information. Selecting start will send the quest to the watch.

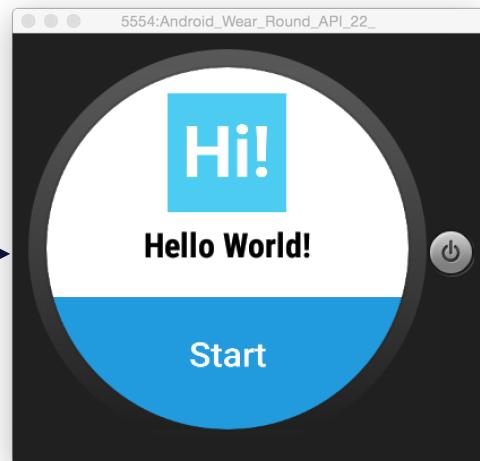


The past quests drawer holds the past quests which show the quest information as well as the recorded heart rate, and the ability for the user to retry the quest. In the profile page the users level, categorical growth, and achievements are displayed. If you select an achievement you can view its information.

Once a quest is completed on the watch the phone will go to the profile page and display the quest complete animation.



When the watch is turned on but a quest hasn't been sent this view is displayed.



Once the user presses START on one of the current quests, the quest will be displayed on the phone.



When the users press start the watch will go to the In Progress screen which is the first screen on a 2D picker. From here the user can also select done once they finish a quest or cancel if they want to quit.

Tips are displayed for the user to view while they are completing their quest.

The users heart rate is displayed on the last screen. Once the quest is completed the heart rate data collected during the quest is sent back to the watch.

Though there are still improvements to be made we believe that our current design is representative of the information we gathered and intuitive and easy to use for high schoolers with social anxiety.



Technical Challenges

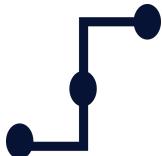
Although we did not experience many difficulties deploying our application on the watch and phone, we did experience many difficulties when trying to implement two APIs - Heart Rate and Data Layer. Both of these APIs seemed to not cooperate well with our application flow, especially when trying to get the watch to read the user's heart rate. In addition, we found that the Data Layer was more difficult than expected when we tried sending images between the phone and watch. However, we were able to resolve the Data Layer API issue, but had to resolve to using fake heart rate data to retrieve result for other parts of our application.



Heart Rate API: The Heart Rate API was extremely difficult to integrate and test via the emulator as the emulator had no way of simulating a proper heartbeat. The emulator also did not have any body sensors that would allow us to test before deploying to the watch and seeing it run real-time.

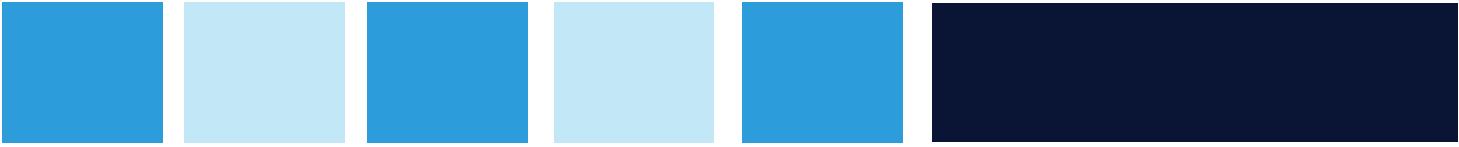
As a result, we had to test all of the heart rate data on the watch and dealt with a myriad of errors that would arise as a result of unknown responses due to a lack of testing before deployment.

An additional problem that we faced was that the code developed to read the heartbeat was originally written to be compatible with API 22; however, we decided to upgrade our watch API to 23 and the code stopped working because it could not recognize the sensors. As a result, we had to sift through many pages of stackoverflow to find an answer and eventually had to fake the heart rate data based on the watch being shaken. Given that we had more time to understand the Heart Rate API in more depth, we believe that we could further expand on the Heart Rate API and deliver correct readings to our user.



Data Layer API Communication System: Most of the complexity in this challenge lay in transferring an image from phone to watch. This entailed taking an Android drawable, extracting the bitmap, and then packaging that bitmap as an asset so it could be passed to the watch in a DataMap. Once it reached the watch, the bitmap had to be loaded out of the asset, then saved to temporary local storage in order for the activities to access it. Besides these transformation details, implementing the appropriate API calls was well documented and fairly straight forward.

There was an additional hurdle we later discovered that involved an incompatibility with the API and our version of Google Play Services. This caused our watch to receive DataMaps with null values. We resolved this by changing our version of Google Play Services to an earlier, more compatible version in the wear gradle file.



Summary

Social anxiety affects 25% of high school age students and can lead to depression later in life. ConQuest provides a fun way to practice social interactions by keeping track of successes and awarding experience and achievements. Our app utilizes smartwatch technology to provide heart rate data for users to monitor and encourage themselves. We carefully crafted quests based on interviews with school counselors and medical professionals. Our designs went through several iterations and rigorous user testing to provide the smoothest experience possible. Despite technical setbacks, our team successfully completed our vision and produced a promising app.



Git Repository and Video Links

<https://github.com/cs160-sp16/Group-23-Project>

<https://www.youtube.com/watch?v=79t0XfF8YsY>