

# Wavelength

Final Report

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## Project name & value proposition

Wavelength is an app designed to connect compatible music listeners based on taste and proximity.

## Team members

Our development team is composed of Connor H. and Sebastian J. Our design/user research team is composed of Corbin S. and Steven K.

## Problem and Solution Overview

The problem we noticed when searching for ideas was that it can be difficult to find friends with the same taste in music. There is a vast pool of musical genres and artists, AND an ever-growing number of ways to consume music.

Our solution, Wavelength, is a platform where users are matched with one another based on sampled music taste and geographical proximity. We encourage users to chat about their music taste, share songs with each other, or even meet in real life and go to a concert together. An important distinction to be made is that Wavelength is not a competitor to other streaming apps or music purchasing platforms, but instead is a place to connect.

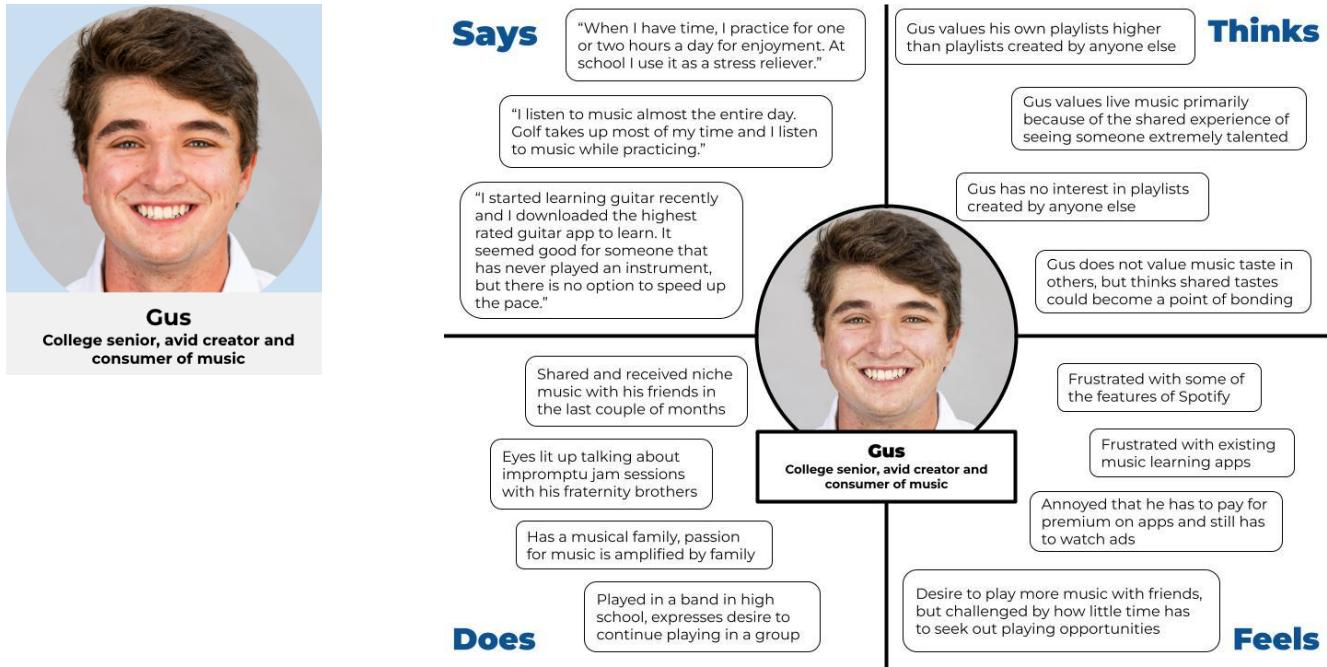


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## Needfinding Interviews

In the process of needfinding we interviewed a number of people with a variety of backgrounds in music and otherwise.

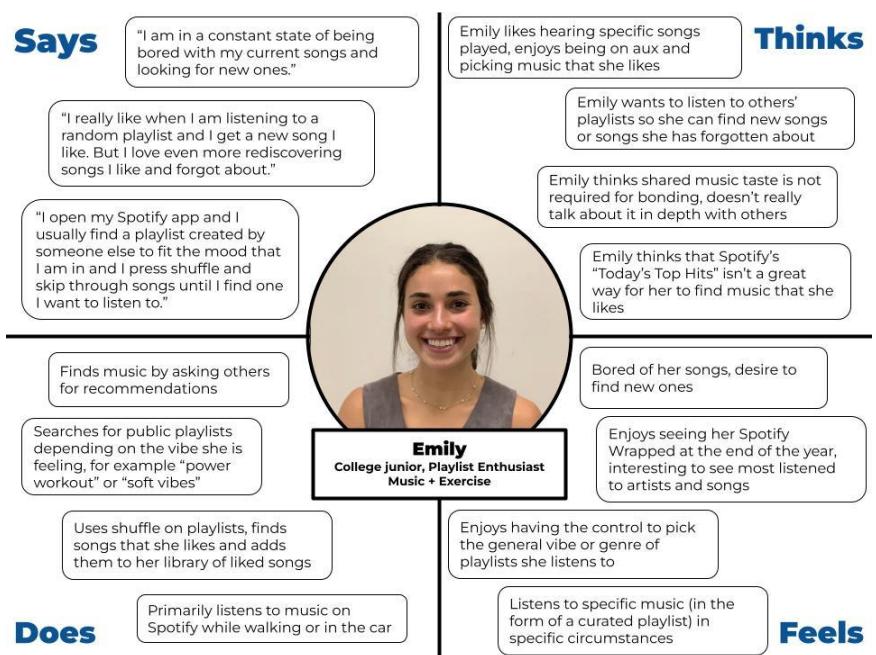
First, we interviewed Gus, a college senior, avid music creator, and an active music listener. Something impactful that Gus told us in our interview was that, “I started learning guitar recently using an app to learn. It seemed good for someone that has never played an instrument, but there is no option to speed up the pace.” This made us realize that there was a lack of customizability in the realm of music learning.



Next, we spoke with Emily, a college junior who is passionate about making and finding playlists. She told us, “I like going to the gym and finding playlists to set me in the mood—like ‘hype gym’ or ‘power workout’. I like to find a certain type of music to play that fits the vibes when I’m on aux.” This made us think about what it means to *experience* music, rather than just listen, based on your environment.



**Emily**  
College junior, Playlist Enthusiast



Lastly we interviewed Sauren, a metalhead and drummer who listens to over 8 hours of music a day. Sauren let us know, "I've been getting into 'slowed + reverb' music of popular songs when I study, which is on YouTube, not Spotify." This raised questions for us about integrating music platforms and whether listeners become frustrated with the oversaturation of the listening market.



**Sauren**  
Masters student, metalhead,  
drummer, 8hrs of music per day





## POVs & Experience Prototypes

After collecting information from all of our needfinding, we arrived at the final 3 POV statements regarding people we interviewed:

1. **We met** Gus, a music creator and listener. **We were surprised to notice** he expressed frustration over his learning experience. **We wonder** if this means music learning is overgeneralized. **It would be game-changing** to put learning in the control of the musician .
2. **We met** Thana, a guitarist in Pittsburgh. **We were surprised to notice** that finding people who he enjoyed music with in a new city was hard. **We wonder** what makes it hard to enjoy old hobbies in a new place. **It would be game-changing** to help people connect with a new city through music.
3. **We met** Sauren, a drummer and a metalhead. **We were surprised to notice**... his music taste is niche and he is skeptical about sharing it with friends we wonder... if this frustrates him or makes him uncomfortable it would be game-changing to... help listeners easily find others with similar niche music taste

These POV statements paved the way for some explorative HMW statements for each area. Here are some of the ones we came up with:

- How might we make learning programs specific to the user?
- How might we help someone explore a new city through music?
- How might we connect listeners from similar communities to find niche music?

Using these HMW statements, we were able to brainstorm a number of potential solutions that engaged with some of the problems we discovered. Of those, we decided to pick the 3 most interesting solutions as follows. The solutions are respective to the HMW statements above.

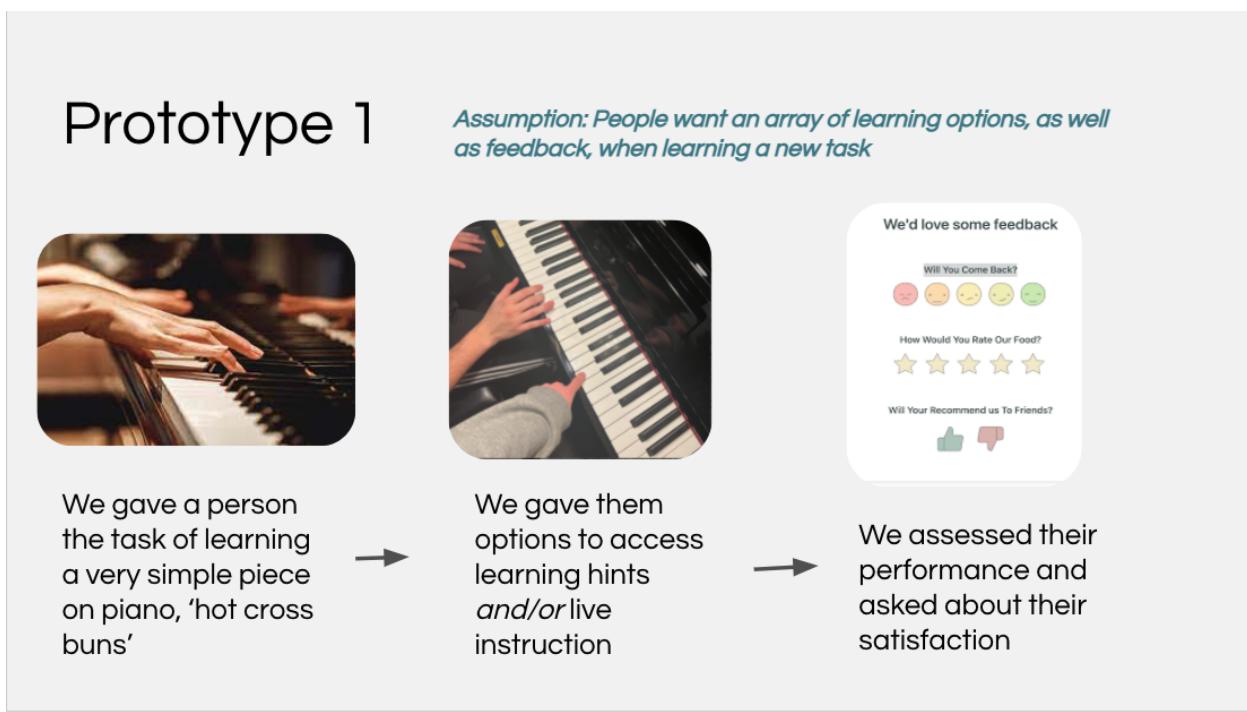
- Giving learners the option of both real teachers and self-led learning, along with rewards for completing learning goals.
- Connect city sightseeing with locally themed playlists to create an interactive experience based on history and environment.

- Help listeners find and meet people with similar music tastes based on exchanging and sharing playlists and songs.

The next challenge was to take these solutions, and develop some method of testing whether our ideas had real-world use. To do this, we created some experience prototypes to test on volunteer participants. Each of our prototypes sought to test an assumption that our solutions were based on, while being easy to perform and engage with.

### Experience Prototype 1:

This prototype sought to test if an integrative approach to music teaching would be well received by a novice on a new instrument.



#### Things that worked:

- Having multiple options helped our participant when he got stuck
- Hints were useful in early stage progress

#### Things that didn't work:

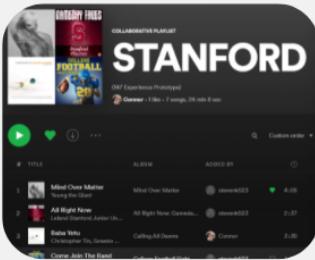
- The concept of how to use hints was confusing to our participant
- The participant was unsure of how to start until a demo was performed

## Experience Prototype 2:

The goal of this prototype was to test out the idea of combining a city-related playlist with a self-guided tour to enhance the sightseeing experience/

# Prototype 2

We wanted to see if the process of discovering city-related playlists as you explore a new city enhances your travel experience.



We gave a potential user a playlist related to facets of Stanford



We asked the user to listen to specific songs in locations relevant to the song with a blurb



We asked the user if (and how) listening to the playlist enhanced their trip to campus

### Things that worked:

- The user liked having a story behind the music they were listening to
- The user found that they listened to the music more intently

### Things that didn't work:

- The user did not like some of the songs (outside of their genre of choice)
- The user wanted to override the requirement to be at the location to hear the song

### Experience Prototype 3:

This prototype was testing our idea of introducing listeners to each other on a mobile type of platform.

# Prototype 3

We wanted to see if people were interested in meeting people in real life with similar music tastes



We let our participants fill out a profile.



They viewed a tester profile with 10 songs belonging to a hypothetical user.

We instructed the participant to suggest a song to the fictitious user based on their profile. They received a song from the other profile in return.



We then asked the participant if they wanted to "accept" the incoming song request. If they accept – we informed the participant that the fictitious user also accepted their song suggestion and that they would now be connected

#### Things that worked:

- The users liked how their playlist acted as their profile
- The users were motivated to suggest a song to connect to the fictitious profile

#### Things that didn't work:

- One user thought the idea was restrictive and would have liked to see more information about the person before getting involved
- The users thought it took too long to suggest a worthwhile song



## Design Evolution

The final solution we came to was an integrative mobile platform where people can create a profile that displays their music and get matched to users with similar music interests. The app, which we called Wavelength to both suggest musical frequency and the idea of ‘being on the same wavelength’, is theoretically supposed to match users based on shared music taste and proximity. We wanted to create a solution that encourages interaction and discovery revolving around the ritual of enjoying music.



Our **basic task** was ‘Creating a user profile’, involving both initially signing up for the platform and customizing what information is displayed on a user’s page. This task was chosen because it establishes the framework for the entire platform; a user’s profile is their outward projection of themselves under the scope of the app, allowing them to display music, location, and a picture that welcomes other users and sparks interaction.

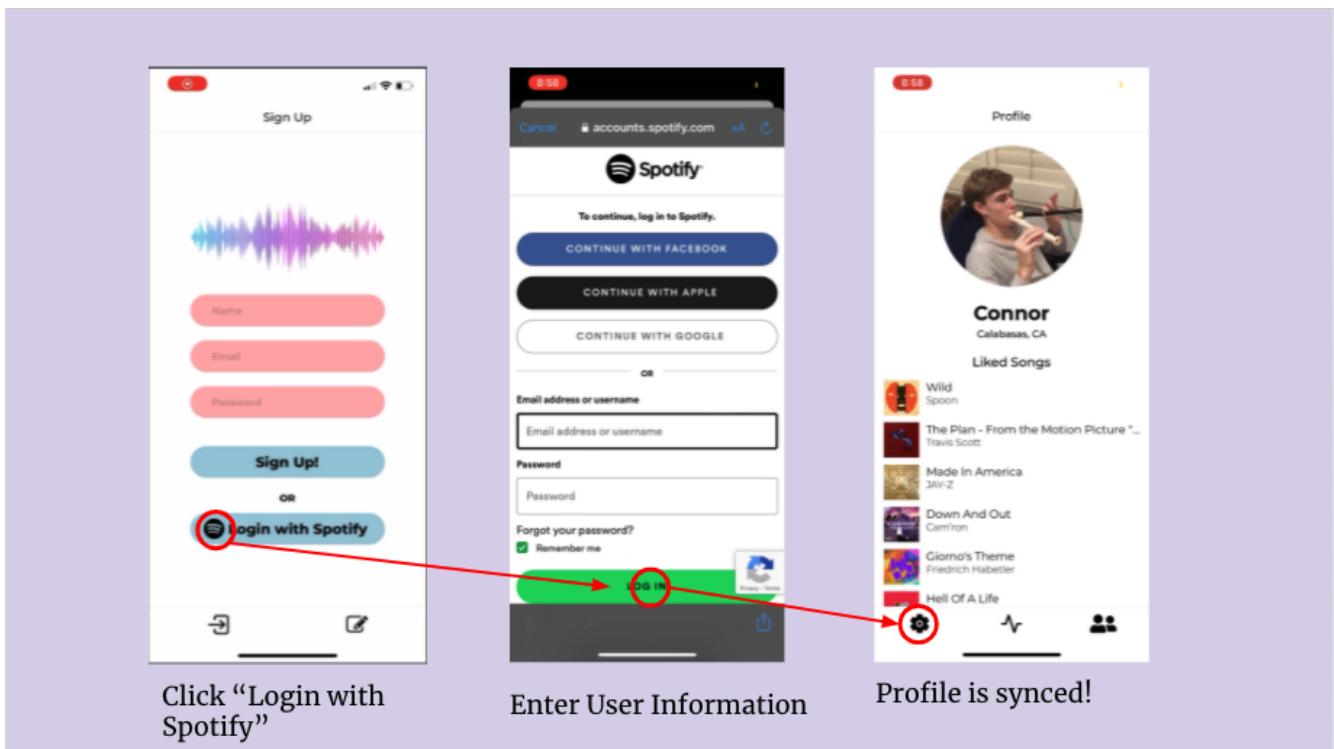
Our **medium difficulty task** was to ‘View a friend’s profile’, which simply entails going to the page of a person you have been matched with and observing their song choices and other information. Our goal with Wavelength was to have matching be a *passive* process, where users receive new matches on a regular basis, and then can interact with these compatible users as they chose. As such, we saw it as important to have this task be a central part of our mobile app.

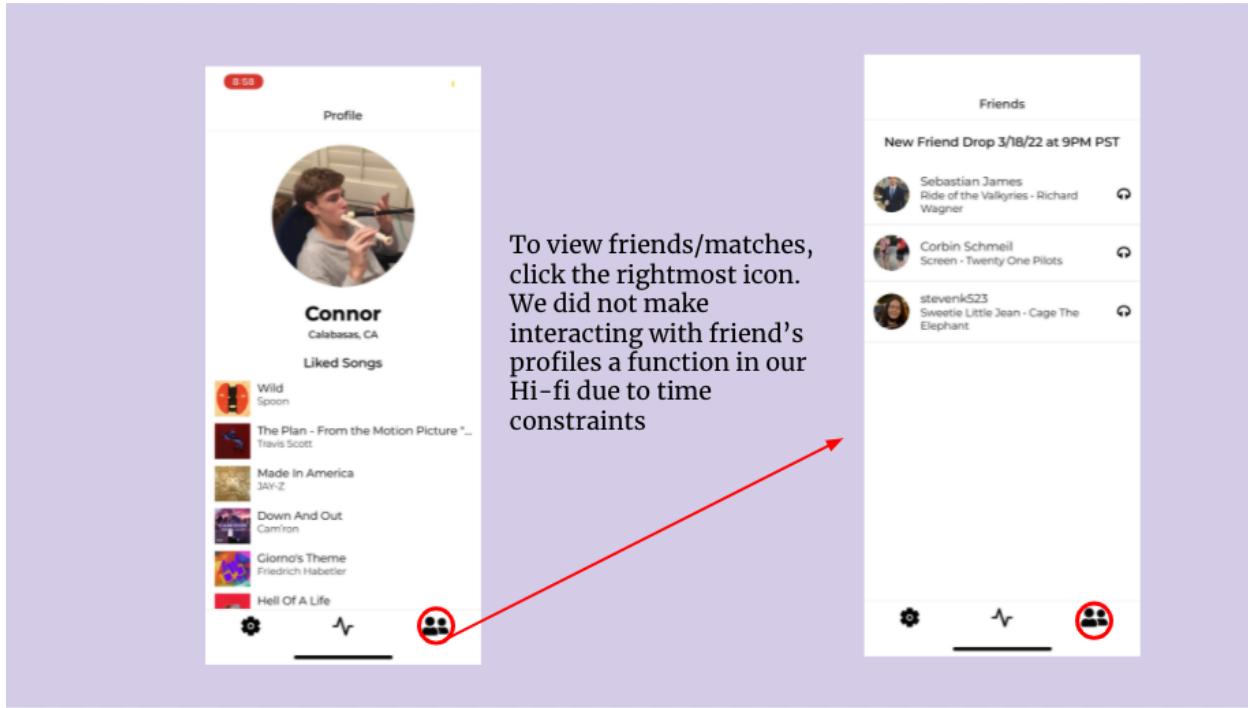
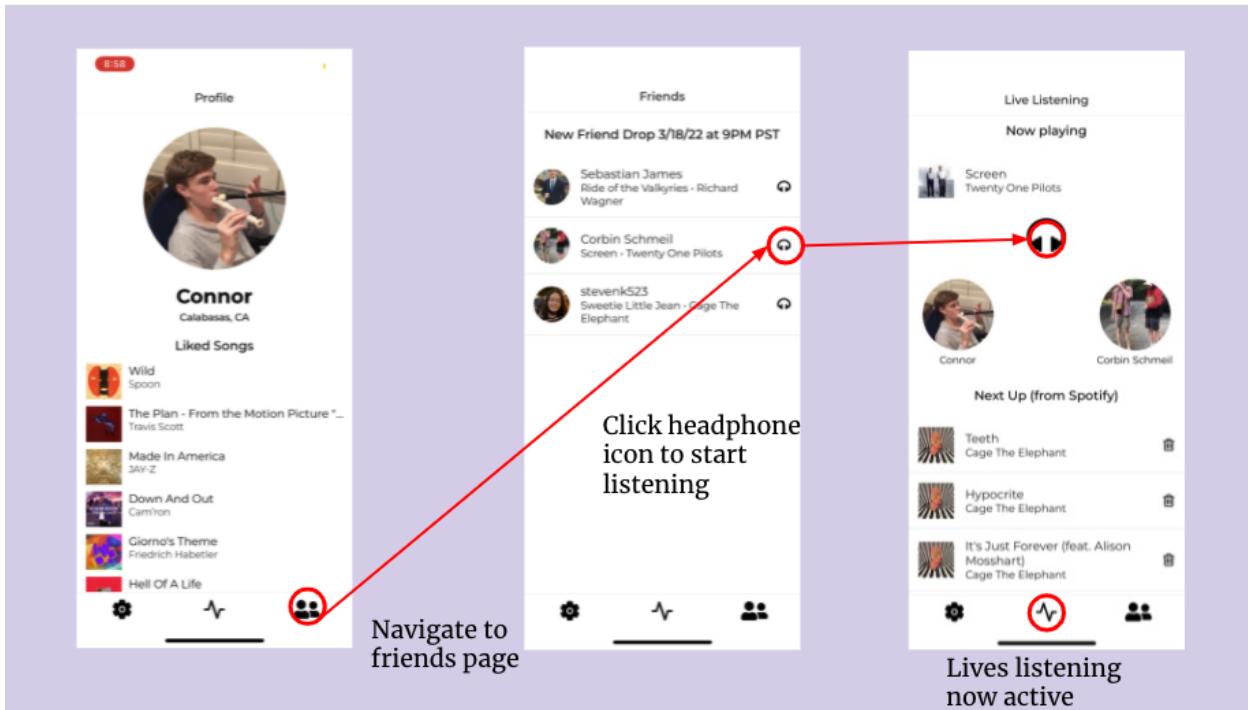
Our **complex task** ultimately became “Start a Live listening session with a friend”. While particularly complicated compared to the other two tasks, we saw this as an important facet of interacting as it is based around synchronous listening. Under this framework, users can share songs with each other in real time in a group session, supplementing other planned features like chat and activity sharing.

These tasks were slightly altered in the Hi-fi prototype due to development challenges; we instead had our medium task be to view the friends tab on the app.

### Final Task-flow walkthroughs:

#### Basic task:

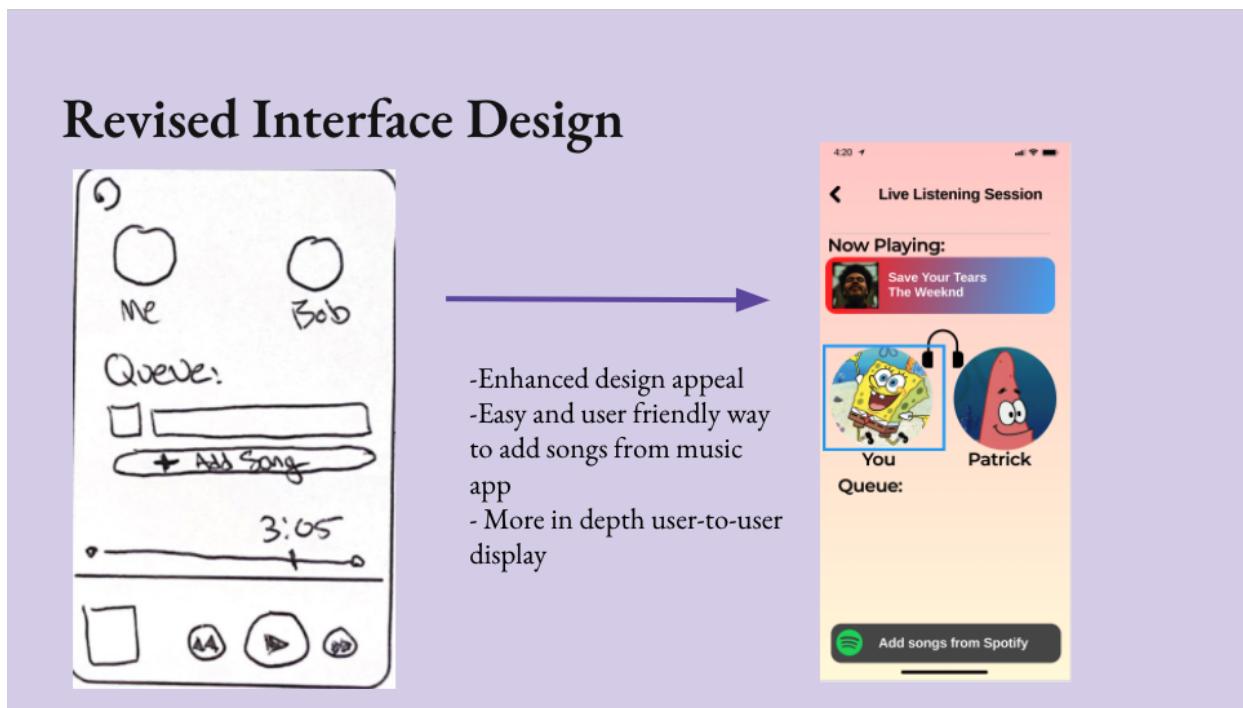


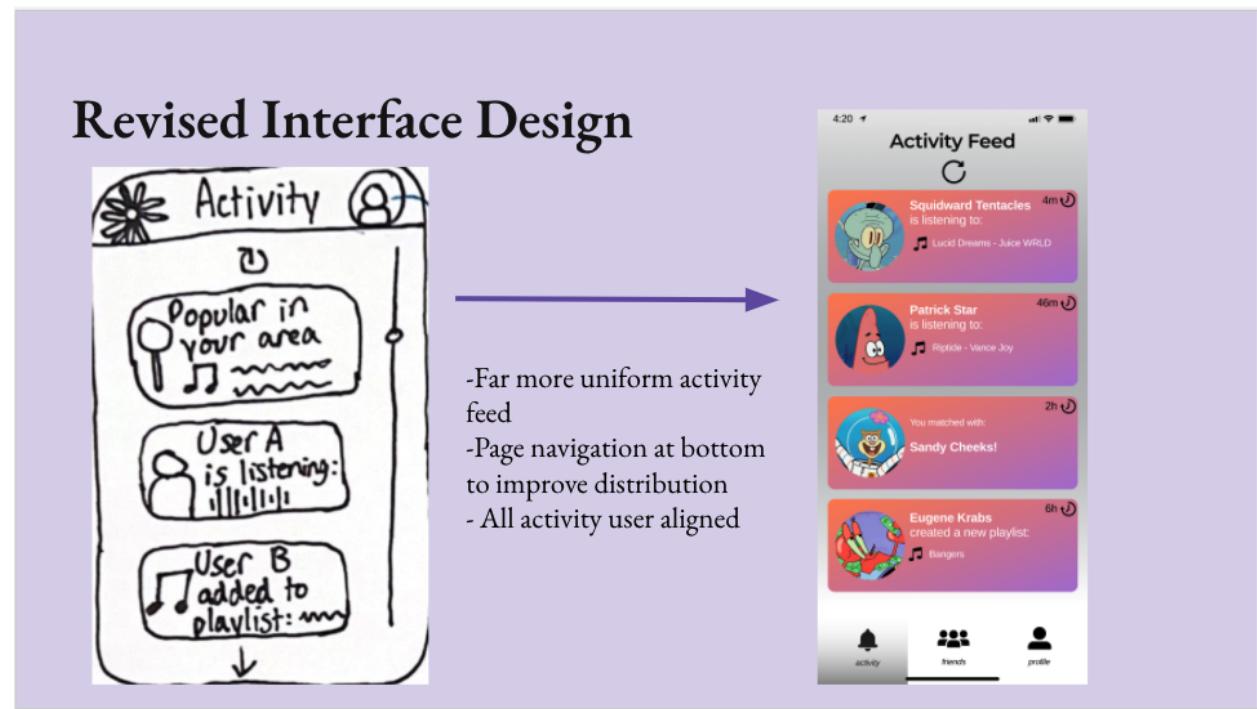
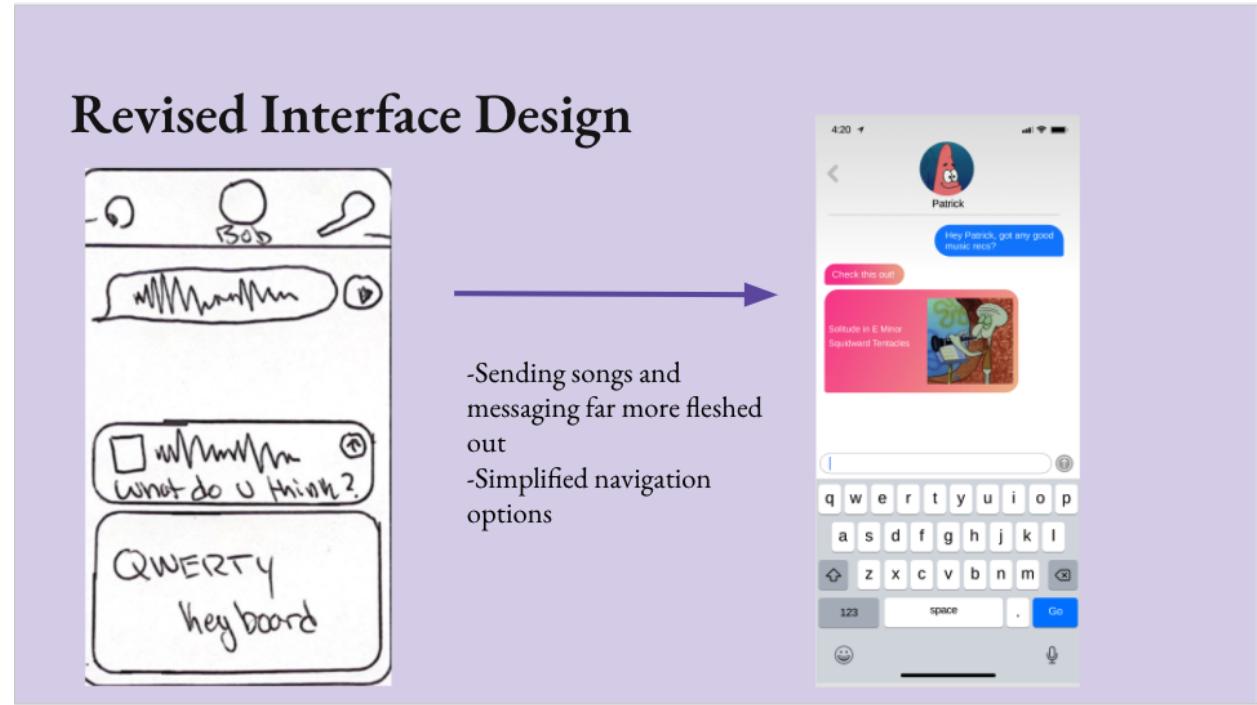
Medium task:Difficult task:

## Design Iteration:

The first iterative changes to our ultimate UI design came in the transitory period between Low-fi prototyping and Med-Fi prototyping. The major changes we made during this period are as follows:

- Enhanced design appeal of Live Listening Page
- Easy way of adding music by integrating with Spotify
- More in-depth user-to-user interactive display, including profile pictures and song additions
- A fleshed-out chat function where users can send songs
- Simplified navigation options, like a back button
- Uniform looking activity page, centered around friend's current listening

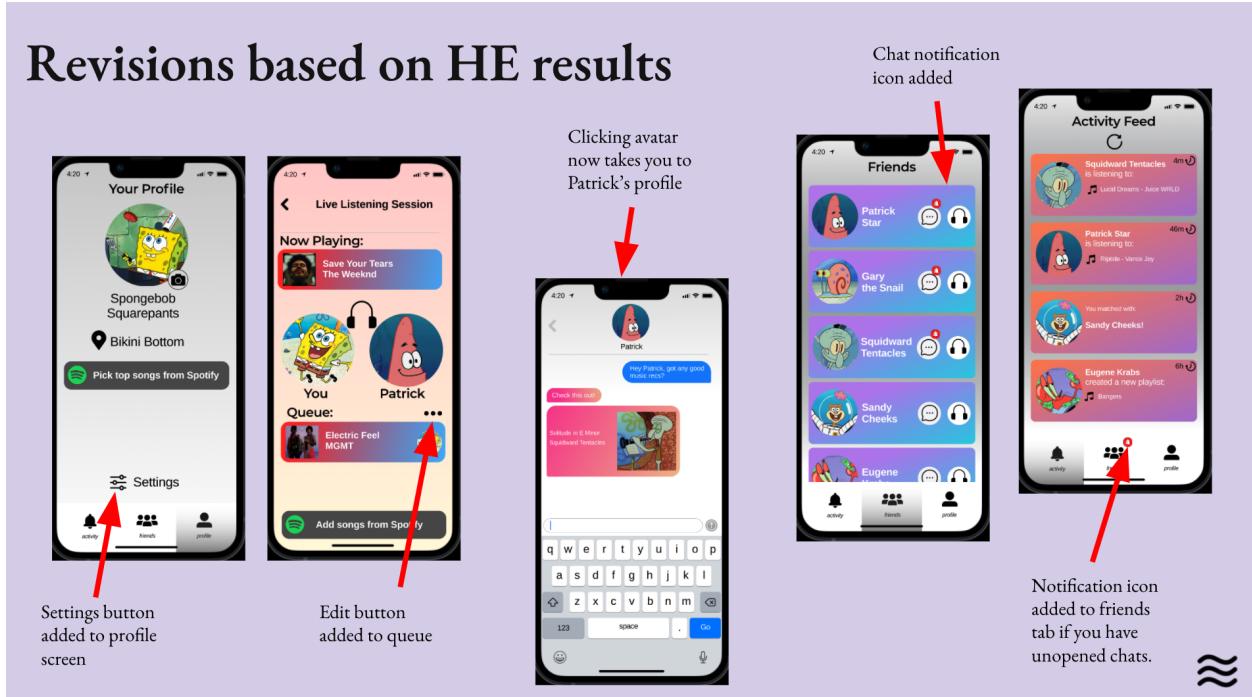




We also included a number of executed design changes from Med-Fi to Hi-Fi. Many are disclosed in the summary of heuristic evaluations outlined below, but here is a broad overview of some changes we chose to focus on:

- Including notification and settings buttons

- Fleshing out navigation options to be more user friendly
- Allow editing of live-listening queue for error prevention



## Heuristic Violations:

Some of our peers reviewed our prototype and compiled a list of Heuristic violations into an evaluation. The more severe takeaways of this process are discussed as follows.

### Severity 3:

1. H1: Visibility of System Status / Severity 3 / Found by: D, C, A
  - The design of the app has a lack of notifications for profile updates, chat messages, or new activity feed content.
  - Fix: Incorporate a signal for notifications throughout the app screens.

**Fixed**-small notifications icon will appear on friends page logo; specific notifications will appear on chat logo
3. H3: User Control & Freedom / Severity 3 / Found by: D, C, B
  - Currently, there is no way for the user to add songs from the live listening session into their own playlist. This minimizes the interactions the users can have with each other's

music and makes the music connection more difficult to maintain as users would have to exit the app, go to their music app, and add it themselves.

- Fix: Add a button or navigation tool that adds songs from the session into your playlist.

**Not fixed-** Playlist functionality organized through spotify; wavelength does not operate a music library itself. Usr can click a song to navigate to spotify, and add from there!

#### 4. H3: User Control & Freedom / Severity 3 / Found by: D, C, B

- The live session screen does not allow the user to remove or undo a song addition they made, which gives the user less control.
- Fix: Add an undo or remove button to remove and change the song lineup/queue.

**Fixed-** add edit button to right of queue

#### 6. H3: User Control & Freedom / Severity 3 / Found by: C

- The user is forced to click done when selecting a song for the live listening session, even if they don't wish to add any new ones. (task 3)
- Fix: Add a back or cancel button to the interface to account for this

**Not fixed-** User can click done without adding any songs

#### 8. H4: Consistency & Standards / Severity 3 / Found by: C

- Is the activity page the home page? It feels unintuitive to have the notifications page be the first thing we see. (no task associated)
- Fix: Usually there are two distinct pages for home and notifications

**Not fixed-** We are treating the activity page like a landing page, much the same as other social apps like instagram do. We would like to keep this the same, and instead have added notifications to distinguish.

#### 9. H4: Consistency & Standards / Severity 3 / Found by: C, B

- The playlist and song icon are the same and may cause confusion when the user tries to navigate. (no task associated)
- Fix: Use distinct icons to distinguish between the two

**Not fixed-** unclear on meaning of 'song' and 'playlist' icons; nothing labeled as such. The spotify logo remains the same for 'Pick top songs' and 'Add songs' because both function by accessing spotify.

#### 16. H10: Help and Documentation/ Severity 3/ Found by: (C,A)

There are no resources for help in the design. Users may get confused and have no way of finding assistance. When first starting, it's a little unclear what the purpose of each tab is and where information relevant to the apps function is (i.e. matching vs listening)

Fix: Add a tutorial for new users who first open the app or an FAQ section

**Not fixed-** a rigorous FAQ/tutorial not implementable without actual full functionality of app; outside scope of class

#### 25. H13. Value alignment / Severity 3 / Found by: D

- Lack of profile information. Given that user interaction is a big part of the profile, it should include more information about each user that would warrant interaction.

Currently, only the name, location, and songs are located.

- Fix: Add an ‘About Me’ section, and more photos to each profile.

**Not fixed-** We would like to keep profiles simple, readable, and focused on music- this is a music interaction app, so we would like to hold out values of focusing on music and are opting not to add additional info.

#### 30. H5: Error Prevention / Severity 3 / Found by C

- There is no way to get rid of a song from the queue if you no longer want it there. (task 3)
- Fix: Add “swipe and remove” option

**Fixed-** add edit button to right of queue (see #4)

#### 32. H7. Flexibility and efficiency of use / Severity 3 / Found by D

- Not possible to access the other user’s profile from the chat, which means the user has to go back to the previous screen just to click on the profile.
- Fix: make the user profile picture clickable in the chat.

**Fixed-** Can click on user picture in chat to navigate to profile

#### 33. H7. Flexibility and efficiency of use / Severity 3 / Found by D

- Currently, the activity feed does not connect the user to their friends’ music. There are no buttons or navigation tools that imply the user can listen to their friends’ music from the activity feed. This makes the activity feed very limited and wasteful given the space it takes up in the application.
- Fix: insert the headphones icon to each feed post so the user can engage with the content in the activity feed.

**Fixed-** In the final implementation we will make it so that clicking on an item from the activity page will preview what song the user is listening to!

Severity 4:

7. H3: User Control & Freedom / Severity 4 / Found by: C, B

- The user is unable to change the default settings of the app and is forced to use it as is.
- Fix: Add a settings tab that supports actions like clearing all messages (no task associated)

**Fix-** messages can be deleted individually or entire account can be deleted/ settings available in hi-fi prototype

26. H13. Value alignment / Severity 4 / Found by: D, B

- How do friends get matched? A huge component of the design and mission is about meeting new people, but there is no suggestion or incorporation of a screen that connects new users together.
- Fix: Add a discovery page on the bottom navigation bar.

**Not fixed-** Matching will be passively be done via algorithm which will not be done in scope of this class

34. H7. Flexibility and efficiency of use / Severity 4 / Found by D, B

- There is currently no form for the user to log out of the app, or a button for support/settings. Consequently, if the user is experiencing difficulties with the app, they would have no place to seek solutions.
- Fix: adding a settings section through the profile to log out, contact for support, and tweak other settings.

**Fix-** Settings added on profile page

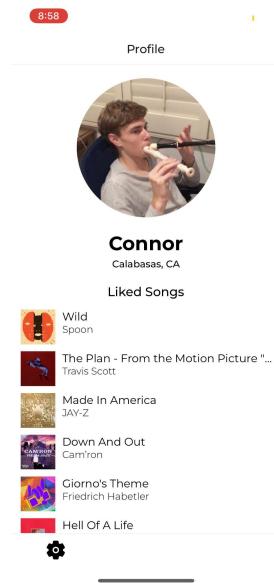
## Values in Design:

Our values in design were initially defined as *simplicity, Protection of privacy, and Fun*. Simplicity revolves around a sleek and easy system of navigation so that users can focus on the music rather than the app itself. We defined Protection of Privacy to entail only sharing their music preferences and profile information with matched users who they approve. Lastly, we

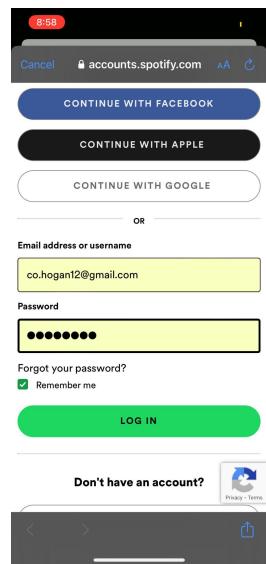
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wanted the value of Fun to express itself in intermittently revealed matches that are exciting and build an air of eager suspense before being unveiled.

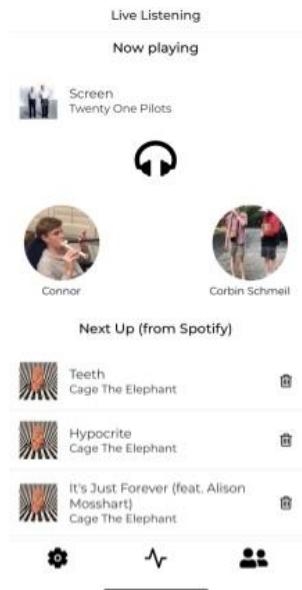
Simplicity is heavily apparent in our UI design: there is abundant whitespace, limited number of adjustable areas, only 3 screens, and integration via spotify that is taken out of the user's hands for ease of use.



Protection of Privacy is manifested in interaction being limited to friends only; user's profiles cannot be seen by people whom they are not matched to, and the displayed music is protected under the scope of the Spotify API.



The Fun value is perhaps most difficult to quantify, but the live listening session which is a major feature strives to connect users in an engaging way. In addition, the passive idea of matching users on a regular basis provides releases to look forward to, particularly when a group of people in proximity, such as on a college campus, are anticipating getting matched.



The main points of conflict between these three values were between privacy and fun and between simplicity and fun. We wanted to be sure users could give enough information to be matched without exposing their information to other users if they did not wish to. Luckily, integrating with Spotify helped address this concern. Ultimately, simplicity and fun did not end up conflicting too much because the bulk of the app's fun comes from the inherent product it is offering and not from UI interaction on any overly-complicated level. Users, if they can navigate the simple app, can access matches and listen live very easily.



## 7. Final Prototype Implementation (~1-2 paragraphs)

We used the React Native framework to build our high fidelity prototype. In development, we used Expo tools to test and publish our application. This combination of tools was very user friendly. Not everyone in our group has the same type of computer, so being able to test on different devices was very helpful. Additionally, the React Native framework (and the general concept of having reusable components in React) saved us a lot of time. An added bonus of using React Native was the wealth of libraries we could easily plug into our application to get excellent functionality without spending hours on end in development. For example, we used React Navigation, a common library used with React Native, to handle all of our application's page navigation.

Another large part of our prototype was the integration of the official Spotify API. We used the Spotify API to allow users of our prototype to easily sign into our application and to automatically import a user's song library and profile picture. This integration was well received in our prototype—our users were happy with the notion that simply signing into Spotify would instantly set up their account on our platform. Furthermore, we used the Spotify API to play 30 second song previews when users clicked on album covers shown alongside song titles.

Although we did not end up fully implementing any “live-listening” functionality to the prototype, we found the Spotify API to be exceedingly developer friendly such that adding “live-listening” is feasible. In the absence of this feature being live, we decided to “Wizard of Oz” our “live-listening” feature. When a user navigates to the “live-listening” page, our idea was to play the song preview associated with whatever song the other user was currently playing. We believe that this approach would be an adequate simulation for the fully implemented feature.

In addition, we used MongoDB and Express to build a very basic backend for our prototype. However, we faced issues when our server needed to tunnel to connect to our mobile devices during testing. Although eventually we found a solution to this issue ([ngrok](#)), we decided to hard code profile and song data into our frontend so that some data could be shown from any device—even the ones that could not connect to our local development server.

## Next Steps

The biggest learning point for our group in the development process of Wavelength was how an idea can transform tremendously through periods of design, implementation, and testing. We initially started with an idea for “Tinder, but for music”, and this morphed into what our Hi-fi

prototype is now, an app that passively matches users based on interest. The design of our interface evolved a lot based on early stages of prototyping, and this helped cut out unnecessary details from design and make us focus on what was really important. We've had a lot of fun discovering how our solution is best implemented, and using the Hi-fi prototype as a starting point, we have discussed making the app fully functional on our own time. The difficulty in creating a real product out of our idea is that constructing a matching algorithm takes work, so this will be a main point of focus moving forward. We would like to develop a chat function, to embed more tools for interaction, and to allow users to customize the songs displayed on their profile. With the same goal in mind, to connect compatible music listeners, we hope to deliver Wavelength as a real world platform that people can use in the near future.