

**TITLE**

Resonance

**INTRODUCTION**

Music, together.

The target users of Resonance are college students focusing in creative majors. These users want to have music playing dynamically in creative group settings with minimal disagreements. Pre-made playlists cannot properly adjust for the mood of the room and one person in charge of music leads to biased choices and distraction.

Our team is comprised of Christina Stanfield, Gerard Gaimari, and Trevor Alexander. The team operates with no one person as the lead to emphasize strengths of all members. Each person contributed to exploring the problem space, tasks to focus on, user research, and solution design. Stanfield used previous knowledge of Figma to create digital mockups based off of an iterative paper prototype and Gerard did the same for the hardware prototype. Through each stage, the team reviewed and revised with a keen eye for detail.

**BACKGROUND**

Students in creative majors often listen to music while working on their assignments. Choosing which music to listen to while working alone is trivial, but this task becomes complex when working in a group setting. Often, students are pressed for time and desire easier ways to play music that complements the environment's mood and context. Our solution is a portable touch device that can connect to an existing speaker and compiles feedback from all users in a group. The users interact with the box using their phones and can anonymously send feedback and suggestions. Our design makes the hard decisions for the group by providing music recommendations in real-time based on user feedback and suggestions—minimize distractions, maximize productivity.

**USER RESEARCH**

During our research process, we aimed to explore how different environments and settings affect group interactions with music. Interviews with diverse college-aged individuals who used music in different settings allowed us to gain a deep, unique perspective within a short time frame. Notably, we discovered our design problem was much more open-ended and loosely-defined than originally intended—we thus decided to narrow our primary users to groups of college-aged students in creative majors. This refinement allowed us to achieve specificity and directedness in our tasks, designs, and understanding of the root problem. We identified two key tasks that were essential to solving the problem and that our design needed to successfully address.

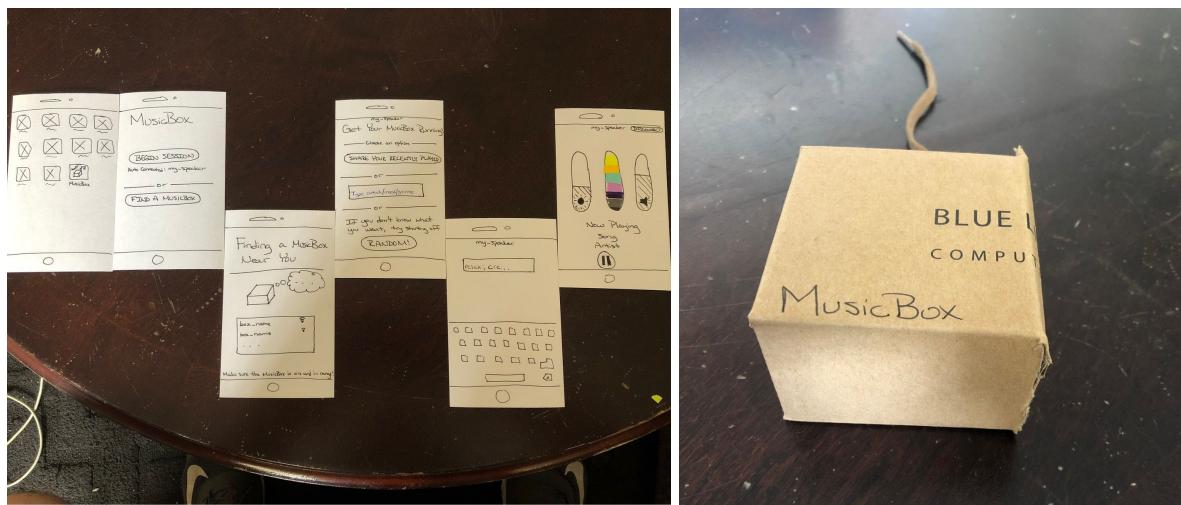
The first task Resonance handles is dynamically selecting then playing music. Our users want to focus on what they are doing in the moment, not on which song to play every three minutes. This is where our design diverges from the current solution of selecting a person to be the central authority for choosing music. Interviewees agreed having a single person in charge often leads to biased music choices where everyone's opinions are not equally considered, thus negatively affecting group productivity.

The second task of giving non-disruptive feedback is crucial to solve or else our design would be a glorified playlist. Users want to quickly express their opinions and provide suggestions so 1) their work is prioritized and 2) the music is representative of everybody's preferences, contributing to a productive environment.

There were additional constraints on our design discovered through user research. All of our interviewees already had working speakers they liked, and did not have money to spend on another. Considering the budget of our users, there was no need to build a new "smart" speaker; rather, create a speaker accessory that makes an existing speaker "smart". Our interviewees also already had a phone capable of playing music and communicating with other phones and speakers. Combining the speaker accessory with a user's existing phone, we allow users to unlock new interactions leveraging familiar hardware.

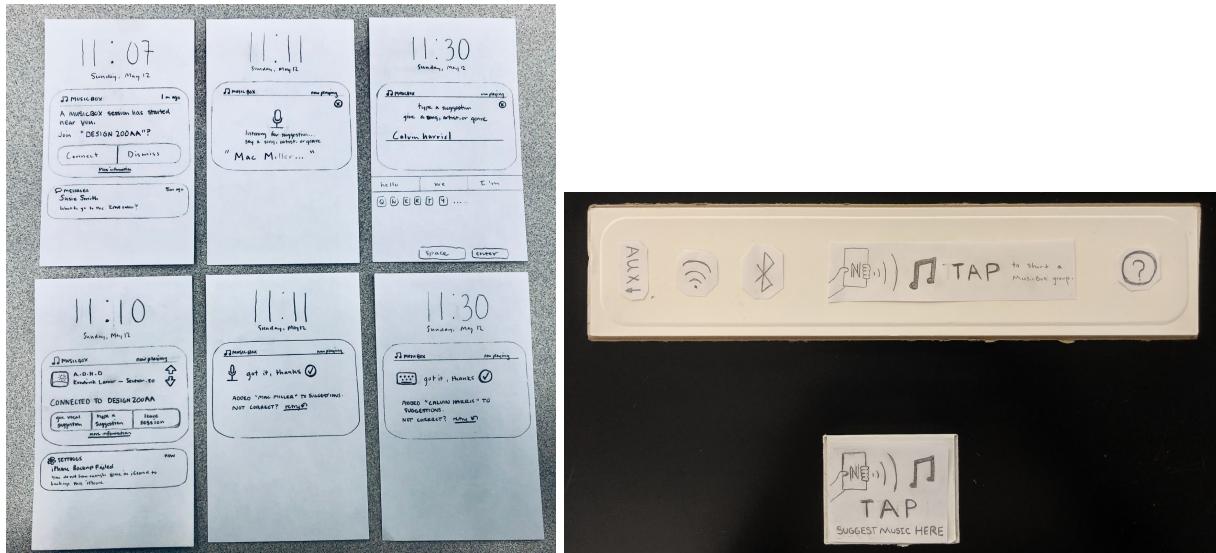
## PROTOTYPES AND USER TESTING

While brainstorming designs it quickly became clear users must fall into two distinct roles for our design to be functional: host and guest. The host is in charge of the Resonance device, starting a music session, and controlling volume/pausing if needed, and requires a separate set of interfaces to support their unique role. The guest role comprises the rest of the group, and has its own interface to support providing feedback and suggestions. We decided the Resonance device itself must plug into a speaker, perform the hardware/software tasks necessary to generate dynamic recommendations, and contain an NFC reader which when tapped allows a device to connect with Resonance. The implementation details and ways in which the interfaces and device support the described functionality evolved greatly over time.



Paper Prototype V1

In our initial prototype heuristic evaluations revealed were concerns with the necessity of the physical device in the setup process and how it overall helped facilitate the completion of our primary two tasks. Additionally, the box did not give many options for control and seemed to limit potential applications. More feedback revolved around a confusing onboarding process in the host application, and how the NFC reader worked.



Paper Prototype V2

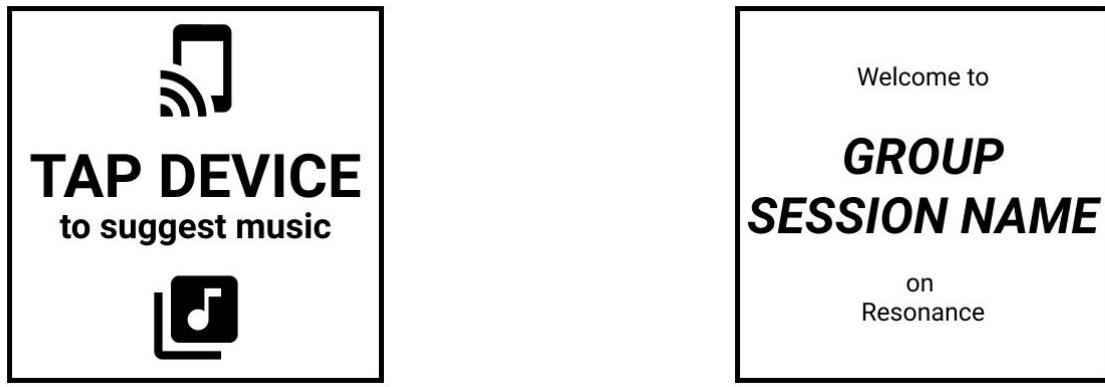
The second version of the paper prototype took heuristic evaluations into consideration. More information and interactions can now be seen on the physical Resonance, including additional speaker connection options, turning the box into a panel with an NFC reader for the host, and an additional NFC reader for guests. The panel now has a small display that can give song information, group size, and more. All host and guest interfaces were moved to a simple interactive lock-screen widget, allowing anyone to easily connect to a session without needing to download an app. The widget tightly controls the UI flow to streamline task completion and the onboarding process.

User testing was conducted on our second prototype with acquaintances of team members who fit our target user demographic. Users were given sets of tasks to complete and we noted any significant behaviors, areas of confusion, or elements of the design that worked well. We changed our test process to create a more natural environment: first letting the user play through both host and guest roles in a neutral environment, then conducting the experiment in a realistic classroom setting where the user only assumed one role and the proctor role-played as the other. Users responded well to the second version, providing smaller points of feedback that led to our final prototype.

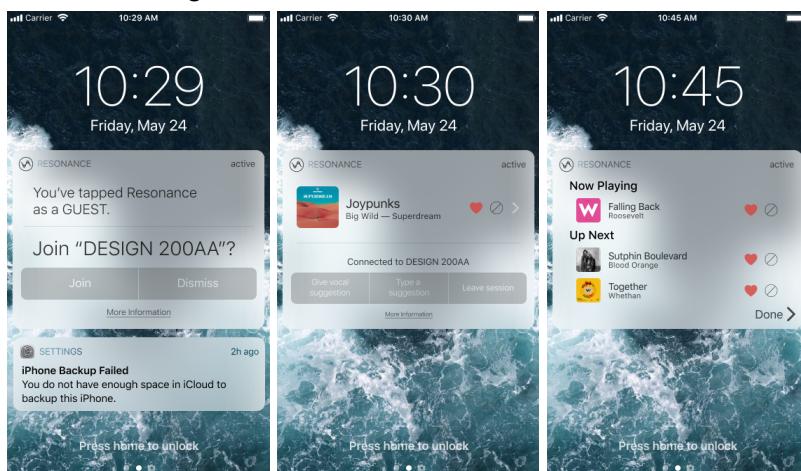
## FINAL PROTOTYPE

Our digital prototype is the product of all user testing and feedback. We aimed to create the most aesthetic and minimal experience wrapped around rich features and easy functionality—welcoming for first-time users, a delight for returning ones.

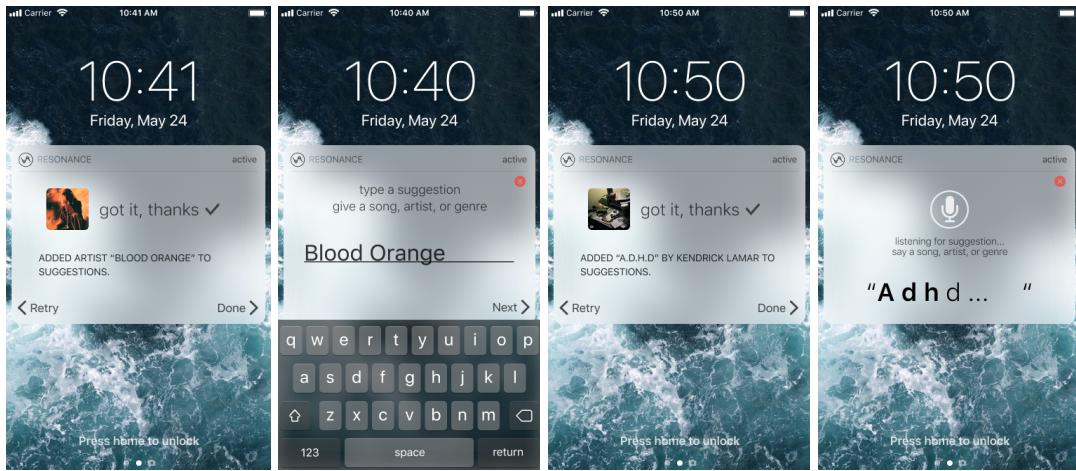
Resonance Node (initial screen ↔ screen for 3 seconds after connect):



Resonance Widget:



The guest taps the Resonance node to join a session and receives the Resonance widget on their lockscreen, then has options for navigation in the main view (middle panel). Tap the like and dislike buttons to give quick feedback for the current song, or tap the arrow to vote even more on the upcoming selections.

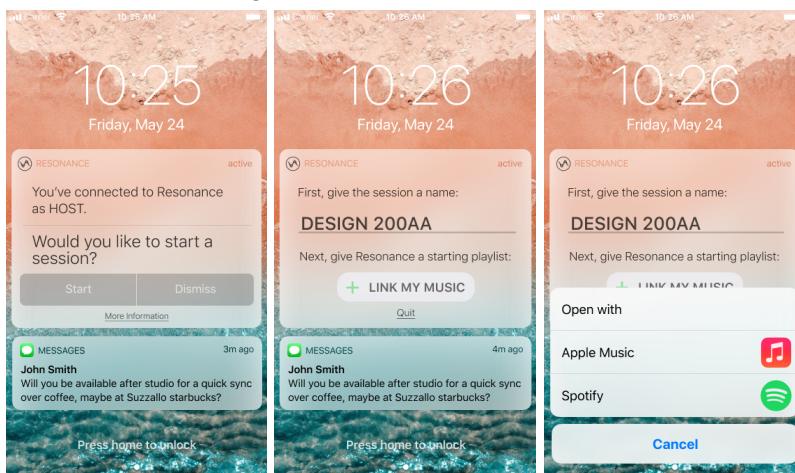


The guest also has two other ways of providing feedback: voicing a suggestion and typing a suggestion. There's a simple flow for typing/speaking input and confirming the selection.

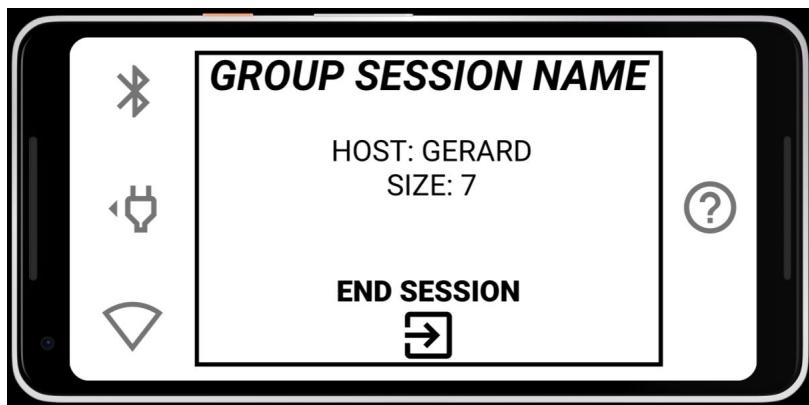
#### Resonance Host Controller:



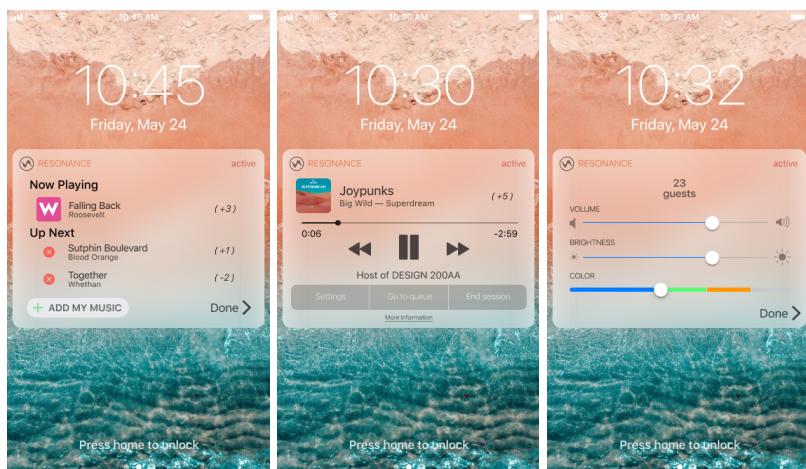
#### Resonance Host Widget:



Resonance Host Controller (after connection):



The host taps the Resonance Controller then receives the Resonance widget on their lock screen. Just give the session a name and give Resonance's algorithms some starting content off your music streaming service of choice to start!



The host has unique controls, including the ability to play/pause/skip/rewind songs, manually control the queue (only if needed), view the like/dislike count on songs, and adjust the volume of the speaker. There are additional customization options to change the color and brightness of the Resonance Controller!

## PROJECT RETROSPECT

We have designed and polished a product to alleviate frustration caused by the often flawed nature of group dynamics. For something as important and beautiful as music, our goal was to create something as important and beautiful to make music collaboration truly seamless.

Narrowing our target demographic to students in creative majors was the catalyst for a minimalistic design. Our guests needed discrete and timely ways to provide feedback in the context of a productive, busy classroom/studio setting; hosts needed only basic controls as backup, for the Resonance device handles the dirty work.

Prioritizing a simple interface, we developed a widget without a companion app to support user interactions. This is clearly a technological constraint as there are no existing implemented widgets/notifications that appear on the lock-screen without the installation of the associated app.

We believe a minimal design is (perhaps paradoxically) the most powerful one since it is more widely applicable to any use case—to any user. Thus we can easily envision this product evolving to support our secondary users: everyone.