Project 3

Emerging Technologies for Services

‘Star’-ship

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Imagine holographic Christmas carolers that just drive up to your front door in a cute little robot!

-Lukas

Overview

Background

The Covid-19 pandemic forced us into a new reality and relationship with technology. While this may not be a permanent reality, it has left a lasting impact on our livelihoods. The music industry has greatly suffered during this period where concerts were replaced with livestreams. Although, concerts will return eventually, live streamed concerts have presented several opportunities for a post-covid world.

Goal

Our main objective involved designing a multi-touchpoint experience utilizing holographic technology that improves the current live streaming experience. In addition, we focused our efforts in designing an experience extending past simply watching a live video on a hologram. Finally, we were design for a scenario that would maintain relevance in a post-covid world.

Solution

Our solution centers around automated delivery robots similar to the Starship food delivery service found on several college campuses. For this reason we targeted **college-aged users at or around flat campuses where Starship delivery is currently possible**. Our robots, however, deliver concerts to small gatherings.

- Touchpoint 1: Ordering a Concert

  Our first touchpoint involves the process of using an app to select a concert, and request the delivery robot to a specified location.

- Touchpoint 2: The Concert Experience

  The second touchpoint consists of the actual robot itself after arrival to its destination. The robot projects the concert through holograms and leaves upon the concert ending.

Seeking an Opportunity

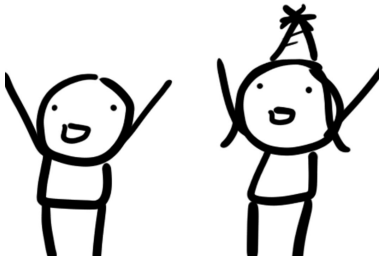
As previously touched on, the Covid-19 pandemic has changed how we experience concerts today. Given our progress in live streaming concerts, it's a safe bet that live-streamed concerts are here to stay– even whilst traditional concerts make a return. However, one side effect has been our perception of what a live streamed concert is and can be. From discussion and interviews with attendees of live-streamed concerts, it became clear there was little variety in their mental models. What it usually came down to was someone seated in front of a screen watching a live video. For this reason, our design process was oriented around breaking these norms and delivering something different.

Additionally, many users seemed to identify negative mindsets around live streamed concerts. Put simply, it did not satisfy the desires to attend a real concert. This is most likely since users viewed them as a temporary replacement to traditional concerts. What this means is that while live streamed concerts may stick around in a post-covid world, they may only be relevant when attending the actual concert simply isn't possible. This perception was of concern to our team, and we saw this as an opportunity to expand upon what it means to attend a live-streamed concert. What if it wasn't just a couple people staring at a screen?

Let's see what that could look like...

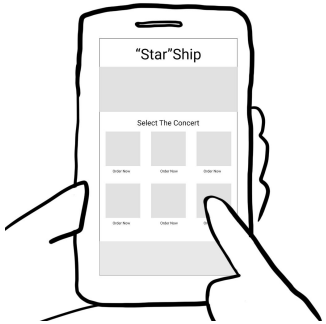
The Experience

To demonstrate our solution to the problem space identified, we created a storyboard that walks through a fictional scenario where Rita and Ivan make use of our proposed solution.



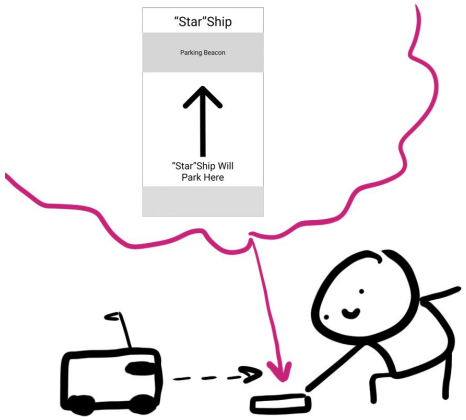
1 Rita and Ivan are having a party! In order to make it the best party ever, they decide to order the “Star”ship.

2 Ivan opens the app and selects Purdue University.



3 Ivan is then directed to select which concerts are available to stream. He selects J. Cole who is performing at 8pm that night!

4 After putting in his address, the “Star”ship receives the order and starts heading to Ivan.



5 When the "Star"ship arrives, by utilizing the app, Ivan is able to place it in an exact location. He places his phone on the ground, the "Star"ship detects the placement, and parks in the spot.

6 Once the concert starts, the hologram is projected from the top of the "Star"ship. Since Rita & Ivan place the "Star"ship in the backyard, all of their friends can enjoy the live streaming concert. Everyone is excited about this unique streaming experience and has a great time.

Design Process

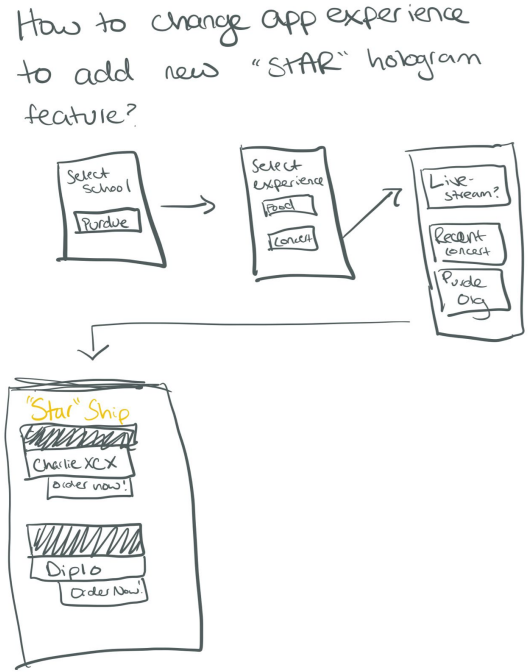
Our design process started from sketching. Sketches helped us generate ideas. We sketched a lot of ideas in the beginning, then discussed them and narrowed down to focus on the hologram concerts for college students. Then, we continued to sketch to add details to our concept. We kept asking ourselves questions, such as "**What interactions could be created between the audience and the artist?**" We sketched out lots of possibilities and expanded the good ones.

To make sure our proposed solution aligns with users' goals, we moved on to make some physical prototypes. These prototypes serves two functions: one is for us to **visualizate, critique, and modify** the current concept; the other is to show to the users to get some **feedback**. Since the hologram concert happens in the physical space, we would like to build physical prototypes for evaluating our concept.

We built part of our prototypes with paper and cardboard because they can be quickly made into the shape we need. However, they are not good materials to represent the hologram, which is a key component in our solution.

Thus, we explored the 3D-sketches and video prototyping to see how we can use these tools to visualize the hologram.

Sketches: Touchpoint 1



The whole experience of our users starts from ordering the concert using an app.

At the beginning, we were considering to incorporate our solution to the **existing Starship app**. The sketch on the left demos the workflow.

Although it may be a benefit to get initial user groups if we start from working with Starship food delivery app, there are lots of uncertainties that may restrict us in creating a consistent user experience for our users. For this project, we determined to design our own app so that we can focus on the **experience that we want to provide** to our users.

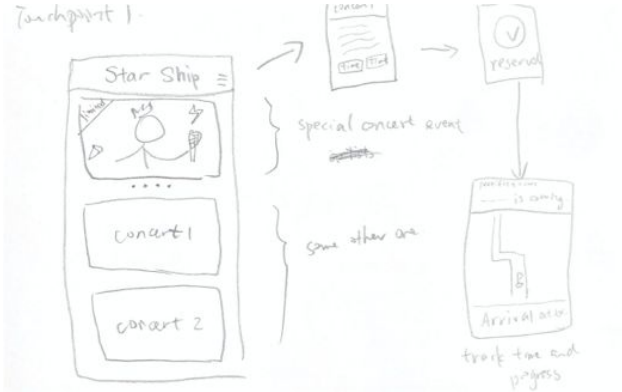
Round 1: Components of the Interfaces

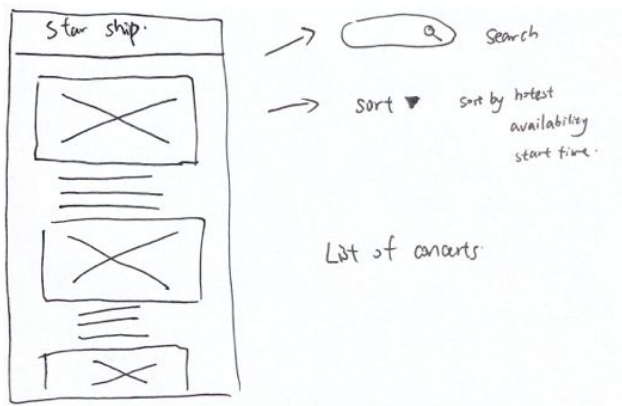
Now we were ready to sketch the components on the interfaces. These sketches helped us visualize what elements are necessary to place an order.

The sketch on the top right explains the **workflow**.

1. The user browse all available concerts.
2. The user select one concert and pick a time.
3. After successfully reserved a concert, the user could track the delivery robot on the app.

As we walked through the experience base on our scenarios, we could find out whether this app lacks any key element or how the app could help enhance the experience. We thought a **search box** and a **sorting button** could be helpful depending on how many concerts are displayed on that page.



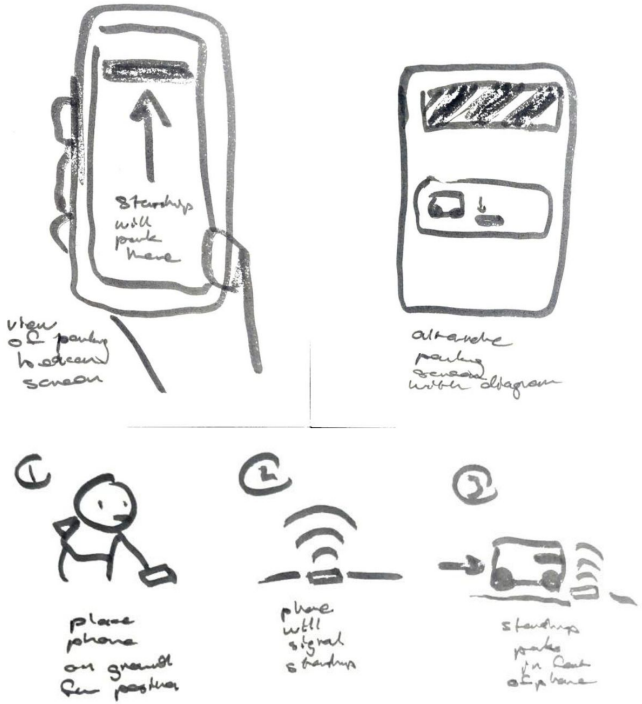


Round 2: Use the App to Guide Parking

It is not hard to sketch the process of placing an order because it is not a new concept for many of the college students. On a different note, a hologram concert requires the delivery robot to **park at the right spot** so that the projector could project the holograms in the right space.

How could we guarantee that? We created sketches to help us ideate solutions for this issue. Although many apps nowadays ask user to manually enter an address or drag a red pin on the digital map in the app, we proposed **a better solution**, which is the sketch on the right.

To make sure the robot arrives at the exact location users want it to be, we let the user to put their phone at the spot. The robot will connect to the signal and park right next to it. Users do not have to make connections between objects in the real world and the abstract map in the app. What they see is where the concert will take place.

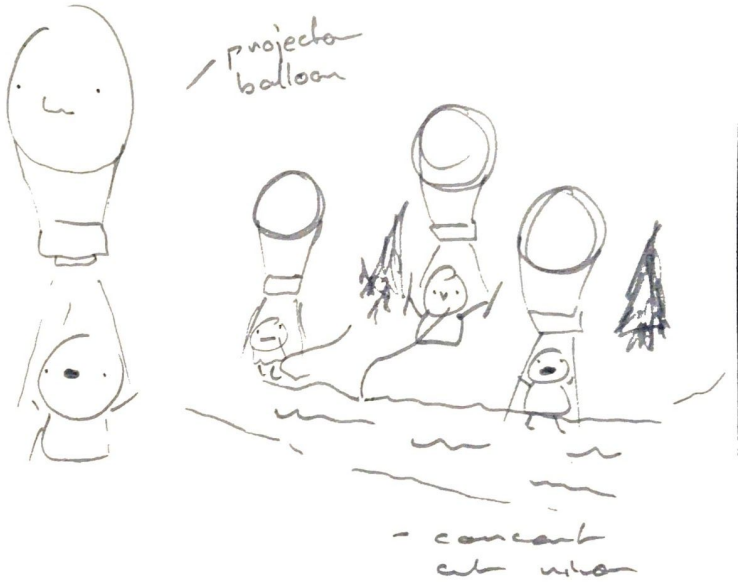


Sketches: Touchpoint 2

As our focus is to create an experience **more impactful than simply watching a video**, we participated in multiple rounds of sketches to assist in narrowing our focus of incorporating holograms. Initially, we imagined creative ways holograms could enhance a live streaming experience.

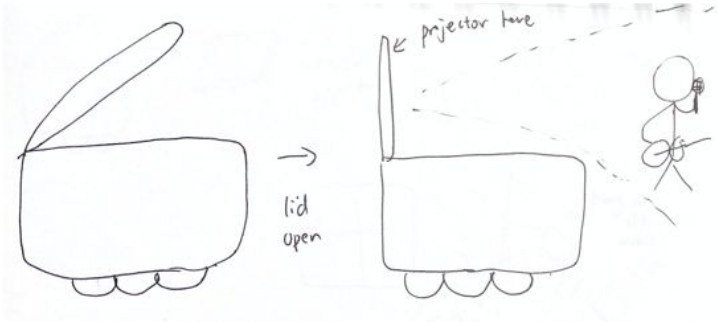
The example on the right shows **holograms being projected from balloons** which can float through the sky while streaming concerts.

While this idea was creative, there were a few drawbacks such as ensuring the balloons do not float away. However, it helped us think more creatively as, we seeked to create ideas more focused on the experience rather than a simple streaming service.



Sketch One

Sketch Two



We then settled on the idea of integrating hologram concerts with Starships.

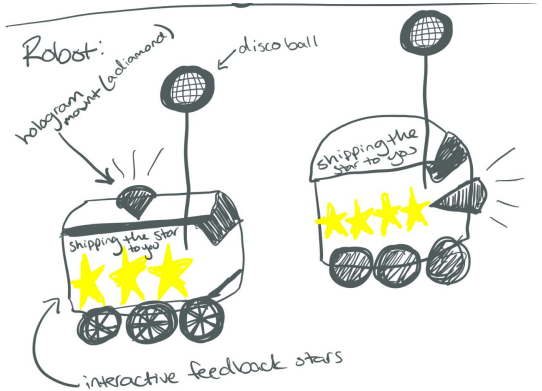
Sketch one:

- This first sketch shows the starship with a hologram being **projected front the top**
- This sketch shows how multiple friends could watch the hologram together thereby enhancing a communal and shared experience

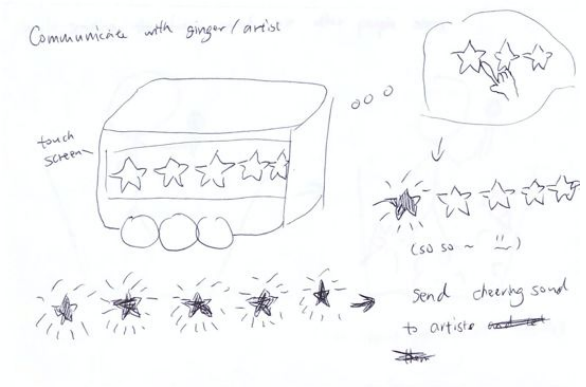
Sketch two:

- While maintaining true to the current Starship design, this sketch **reimagines how the hologram could be projected**
- As Starship lids currently open like this, the hologram would be projected towards the audience rather than above it

Round 2 Iterations - Artist Interaction



- This sketch imagines a revised look for the robots as well as adds stars to start exploring **ideas for interaction between artist and listener**
- This sketch includes **two versions of the hologram placement**, either on top or projected from the front of the machine



- This sketch takes the idea of stars further by showing when users **press on a star**, this will **send cheering sounds** to the artist during the song

Through various rounds of iterations, we were able to explore the two touchpoints. We explored various types of interactions while continuing to try to understand the hologram “Star”ship experience.

Prototype - App

In order to find out whether the workflow of the app makes sense to the users.

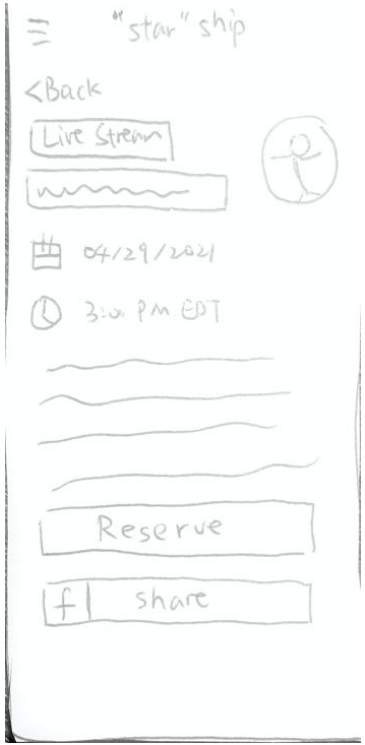
We created a paper prototype for the app to test it with a user. Through prototyping we seeked to gather some feedback as well as discover if there were any areas of confusion.

Select University

This is the page that asks user's university.

View Concerts Available

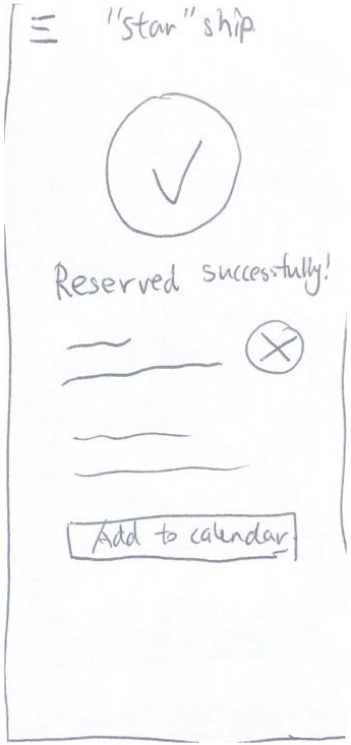
This is the page that shows all the available concerts around the campus selected in previous screen.



Concert Details

Users will be taken to this page if they click on one of the concert in the previous screen.

Click on Reserve button will move forward to next screen.

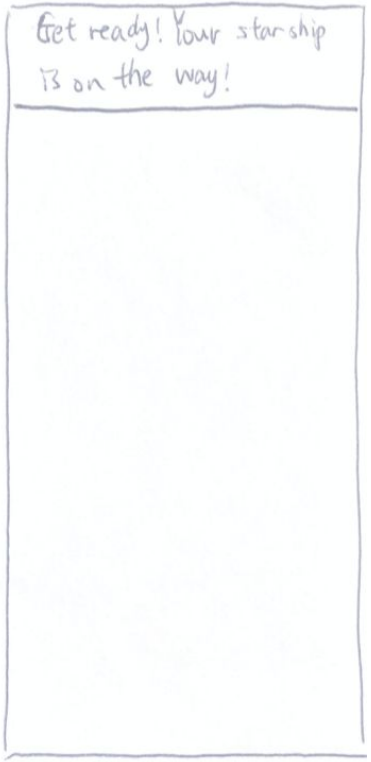


Confirmation

This is the page shows the confirmation and concert details.

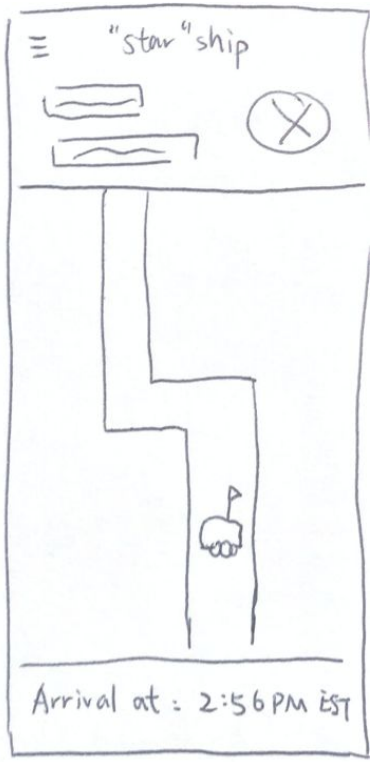
Feedback

There should be a button to take users back to the previous page.



Notification

A couple minutes before the concert starts, users will get notified about the “star”ship coming towards their place.



Tracking the “Star”ship

A brief introduction of the concert and the dynamic map will show on this page and users could get a sense of when the “star”ship will arrive.

Feedback

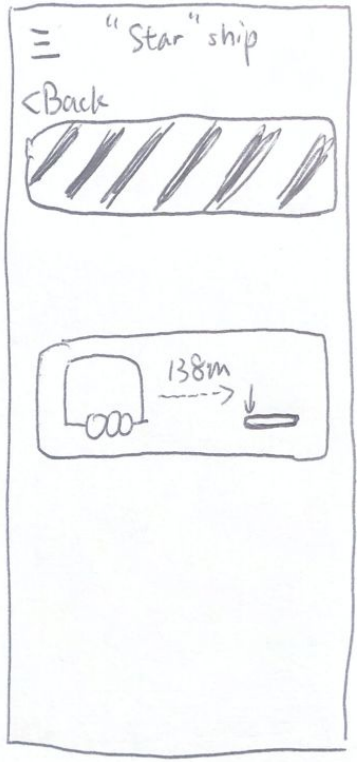
The user was interested to see the route of the delivery robot, as well as more information about the concert, and instructions on how to watch the hologram concert.

Instructions on Guided Parking

When “star”ship is approaching to the address user chose in the app, the app will give users instructions on how to put the phone in the right spot to guide the delivery robot to park near it.

Feedback

Although the descriptions were clear and make sense to the user, he didn’t like the idea of putting the phone on the ground. He mentioned he would be using the phone while waiting for the robot to come and he was not comfortable to leave his phone on the ground either.



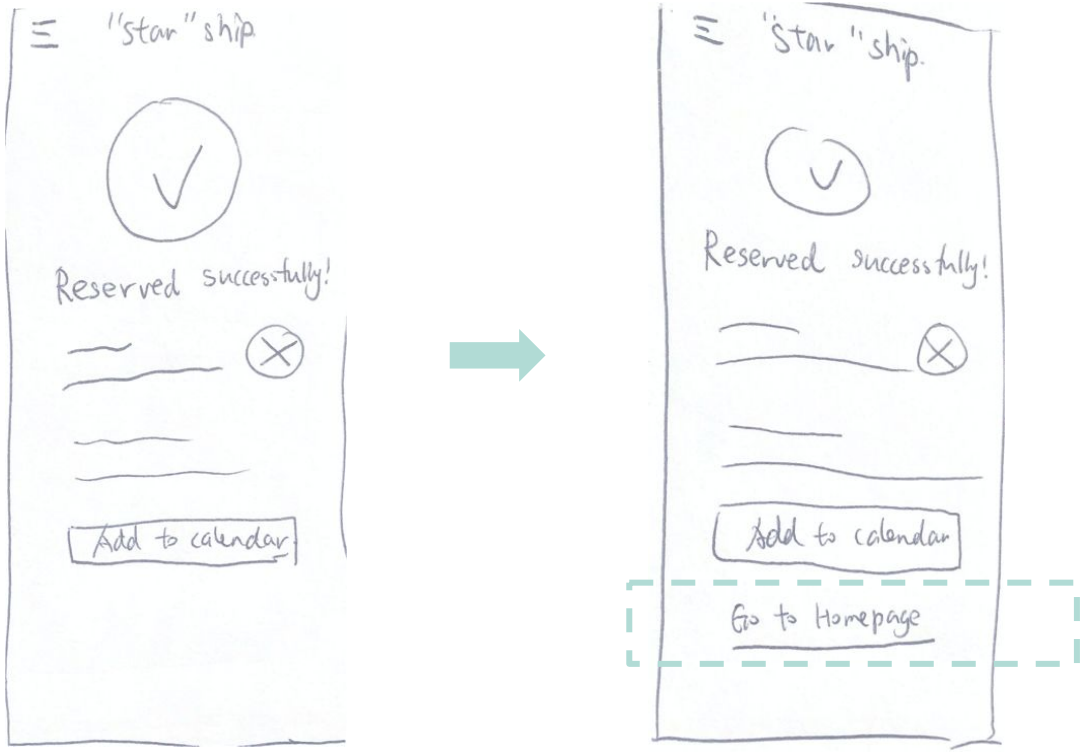
Guided Parking Interface

After user hits the OK button, on the previous screen, this screen shows up and users could follow the instruction to put the phone at the right spot.

Feedback

138 meters seem to be too far and the user didn’t want to let the phone be away from his hand for such a long time. He would like the robot to find him and park nearby when he holds his phone in the hand.

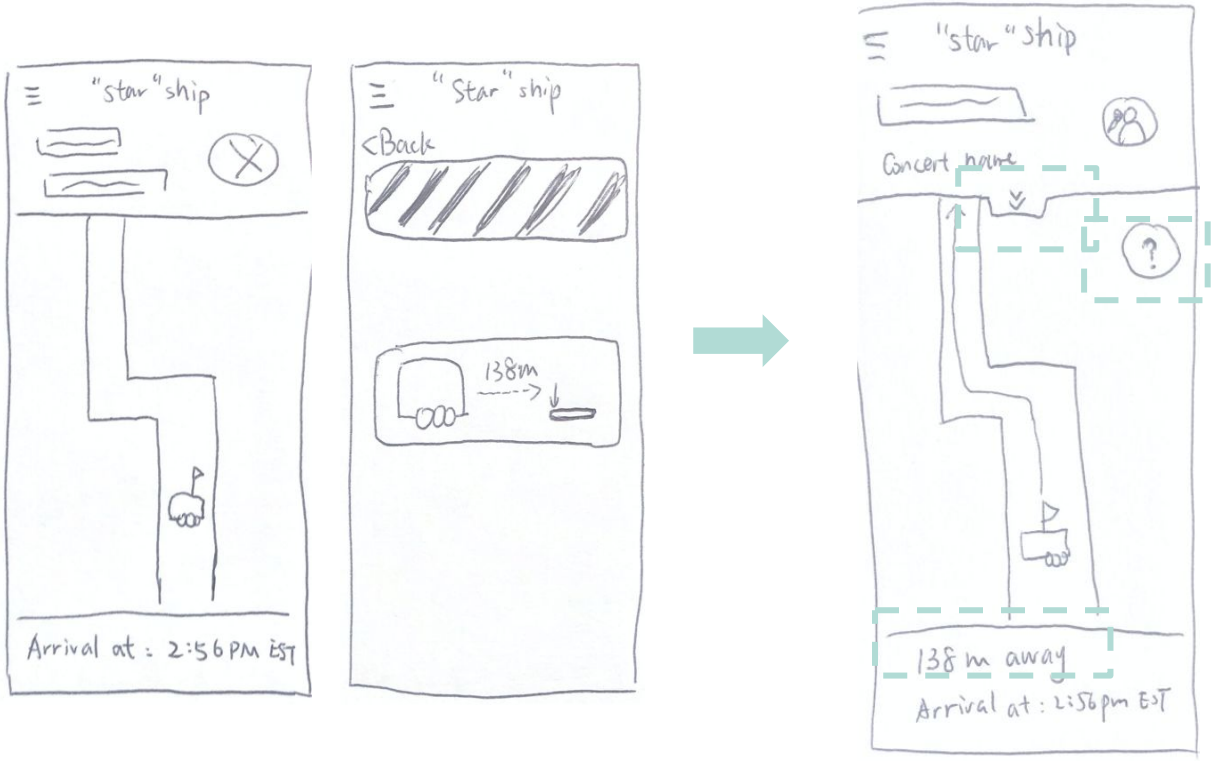
Prototype - App: Modifications



#1

Added a button to go back to the home page.

Prototype - App: Modifications



#2

Click on the icon will expand that section and show more information about the concert and the artist.

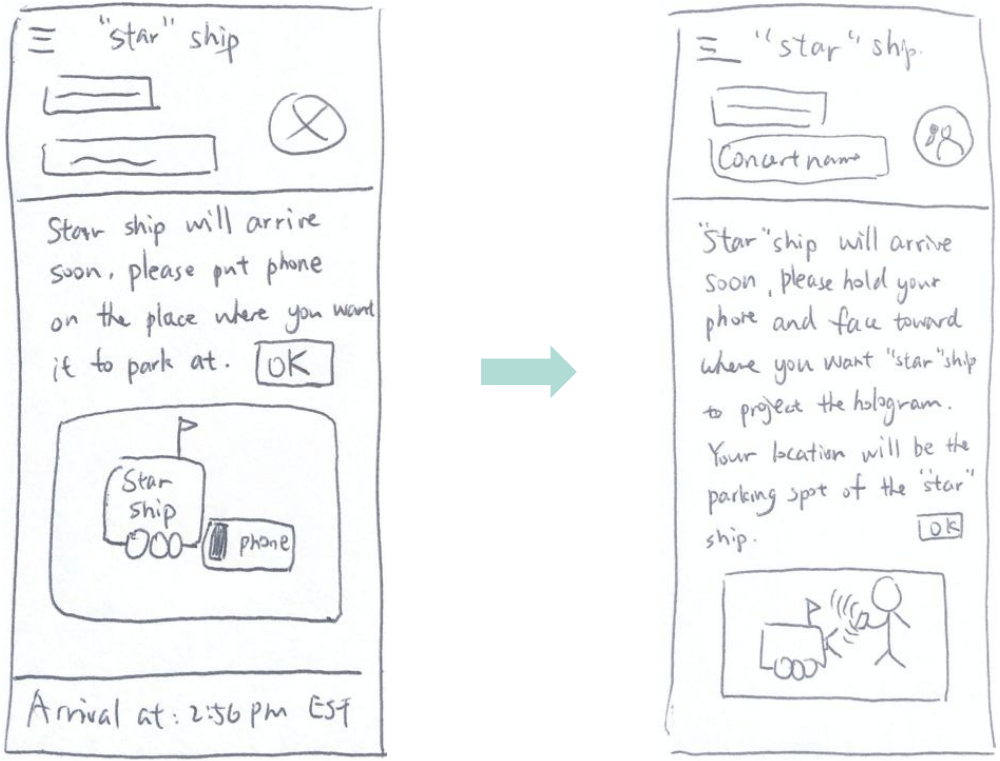
#3

Click on the icon will play a video that explains how hologram concerts work.

#4

The route and the distance are all displayed on this screen.

Prototype - App: Modifications



#5

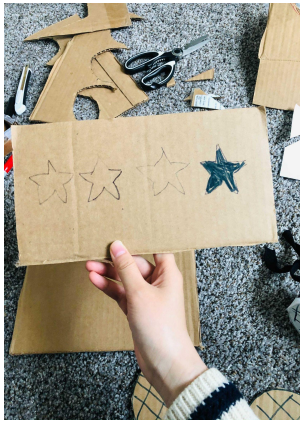
Change the way of guiding the “star”ship to park. Users could hold their phone rather than putting it away.

Prototype: Touchpoint 2

From our sketches, we started to see common themes arise. The first was exploring where we would put the hologram on or in the Starship. We also seek to understand how sound would be projected from the machine for the concert. Below is some materials utilized in for our prototype.

Hologram projector - to be mounted on top or in Starship

Hologram projector - to be mounted on front of Starship



Interactive Stars

Disco Ball (Flag Indicator)

Speakers

In the next few pages, we show how we mixed and matched these various items to help visualize what a “Star”ship could look like. These materials helped us understanding sizing, placement, as well as explore various ideas.

In order to play around with various sizes and shapes of objects, we created a multiple iterations of materials. This allowed us to truly envision what the “Star”ship could look like.

Prototype: Hologram Placement

These images show two ways we **visualize the hologram placement**. The first two on the left show what it could look like from above while the one on the right shows what it could look like if the hologram projector was placed on front of the Starship.

By placing the hologram in multiple spots, we were seeking to understand **what placement could be the best placement**.

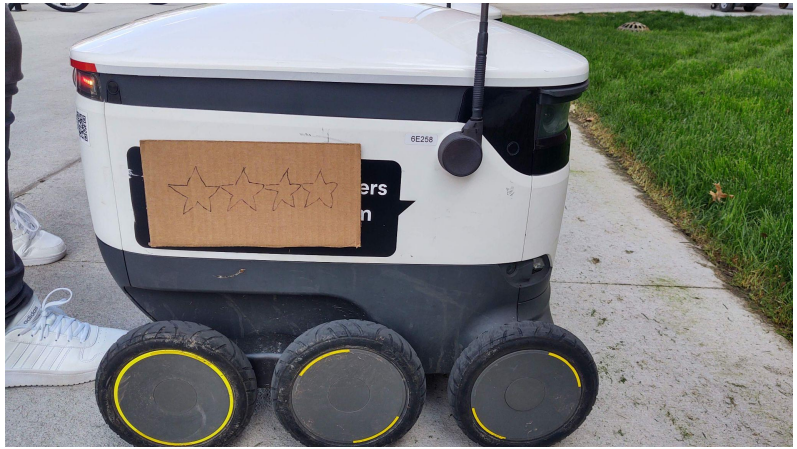
Hologram Projector inside Starship

As opposed to the other images on the previous page, these two pictures show prototypes of the **hologram projector inside these Starship**.

During this prototyping process, our team was **seeking to understand**:

1. What ways could hologram projectors be integrated within the current Starship model?
2. Are the better or worse placements for the hologram placement?
3. How would sound be emitted from the machine?
4. Is there a way we can make the Starship more unique then it currently is?

Prototype Touchpoint 2: Hologram Experience Interaction



Finally, we explored various ways to prototype interaction. We prototyped two ideas.

1. Interacting with starts (as shown above) which could send cheers to the artist
2. Cell phone stand (right) in which you can stream and send your stream back to the artist as they're performing so they can see you enjoying the concert

While our experience is heavily focused on the user's experience, rather than the artist's, this prototype raised more questions about how we can make the hologram livestream more interactive.

Evaluation & Next Iterations

Prototype Heuristic Evaluation

While we were able to prototype on the “Star”ships, we were unable to use them to evaluate the entire experience. This is due to **limitations** in which we did not have access to use a Starship for a greater length of time then about 1 to 2 minutes.

Therefore, due to this limitation, we evaluated our experience through a **heuristic evaluation**. We guided our participants through the experience by using the app prototypes as well as sharing images of our various “Star”ship prototypes.

Lessons from this initial round of testing led us to discover that **users were still having difficulty visualizing what a hologram off a “Star”ship would look like**. While most users liked the idea, this discovery led us to the next round of iterations.

Next Iterations

One challenge we encountered when prototyping is the Starship were constantly in use. While we had all of our materials, we would only have a few seconds to place items on the Starship as it was parked.

Therefore, while prototyping helped us imagine what the Starship could look like, we realized we were still missing, “**What would the actual hologram look like?**”

This consideration allowed us to get creative and use **two different mediums** to visualize what the actual hologram could look like. These mockups are a **new way to visualize our idea** in a different form.

3D - Sketching

As discovered when prototyping on the Starships, we were able to add physical elements easily. However, it was the **virtual elements** that we were missing from our initial prototypes. Therefore by using **TiltBrush**, a virtual reality sketching application, we were able to explore how a hologram would be emitted from the Starship. TiltBrush allowed for rapid sketching and manipulation that could be used in a 3D space.

With a far more **complete picture** of what the robot would look like, we were able to have participants evaluate the experience through the VR headset. In terms of placement, participants were overwhelmingly in favor of the **top mounted projector**.

Perhaps, more importantly, this opened up discussion about what the atmosphere would feel like. This inspired further investigation into a prototype that outlines the experience on a more holistic level.

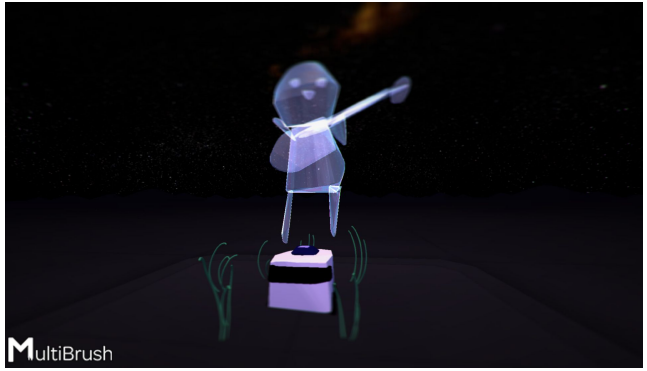


Image of top-mounted projector displaying hologram

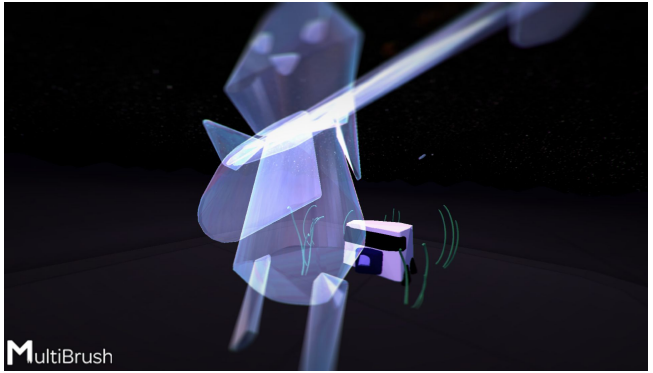


Image of front-mounted projector displaying hologram

Video Prototyping

We generated two scenes using Unreal Engine to demonstrate how the user's experience would be like using our "Star"ship. Based on creating this mockup in UE4, it helped us get a better sense of the potential atmosphere during one of our "Star"ship delivered concerts.

The figures present **two potential scenarios** for our solution. A video with a quick tour of each can be found here. The video allowed our previous evaluation participants to get a better sense of the atmosphere and overall experience. Overall, participants found themselves **excited about our solution**. In further discussion, participants shared ideas about parties, small get-togethers, and or even picnics at the park.

Indoor Scene

Outdoor Scene

Conclusion & Next Steps

Through prototyping through various mediums we were able to evaluate our ideas with our target-user of college-age students. Overall, we received great feedback and users tended to be generally excited. Users did raise questions such as, “How would I get the ‘Star’ship into my house if I only have stairs?” Considerations such as this helped us ideate for next iterations.

While we explored so many great ideas and finalized our concept through our design process, we know this is never the end. Our team chose to focus merely on the concert experiences but there are a few concepts we could further ideate on to provide a better experience to our users.

In the future, we could provide additional services in the app, such as **food delivery**. The sketches on the left show the idea of providing food services along with our hologram concert services. Additionally, we could **integrate our app with the current starship app** to add to the experience of people who are already familiar with using a delivery robot.

Another idea for future iterations includes **working with small music groups for streaming**, especially groups who do not travel a lot. Some music groups are well-known only within certain areas and they do not have too many fans in other cities. We hope to help them connect with more people and also allow fans who are not living in the same city as the artists do to be able to support the artists as well as enjoying their favorite concerts with our “star”ship concert delivery services. Some artists may have certain limitations which prevent them from travelling, but we could help them deliver their concerts to people.

One of the most important next steps we would like to take when possible is **making our solution work in cities or multi-story apartments**. One of the biggest shortcomings of the “Star”ship delivery robot is the delivery time will be affected by how many people are on the road that might block their way and the current version of the robot cannot climb stairs. Because of these limitations, we would start this program in rural campuses, but we could consider either create new models of robots or having custodians assist to deliver a kit of all necessities for the hologram concerts rather than a robot.

Reflection

We set out to change the way we experience live streamed concerts. From Research, Sketching, Prototyping, and Evaluation, we believe our solution presents a strong case that live streamed concerts can be more than sitting on a couch and watching a screen. Obvious limitations exist within our solution, especially with the current state of technology, but we hope this project encourages conversation about what it means to attend a live-streamed concert.

For each of us, this is our last, formal UX studio project. For this project, we set out to have fun, create something memorable, and most importantly, something we are all proud of. Ambitious? Absolutely. Our perception of “what live streams should be” is so firmly implanted in our heads that although we investigated several different avenues, they all led us right back to simply “watching a concert on a screen.” Despite the failed attempts, we continued to challenge ourselves with the personal goals we set for ourselves.

This project had its twists and turns— all which was critical to our growth as designers. Although this is an end, this is just the beginning to many more things to come.

Credits

(Not a team member)

We hope you enjoyed this tale of chasing down Starships and hoping they would stay in place long enough.. Only to be judged by a Purdue Groundsman.

We'd like to thank the Qdoba staff for the open judgements but letting us use the Starships as well as the Purdue Groundsman who thought we were vandalizing the Starships in public, in the middle of the day… We weren't.

“Formal” Credits

Jim Sullivan is a writer based in Boston. Illustration by Dom McKenzie. (2021, January 15). The inevitable rise of the hologram rock concert. Retrieved April 29, 2021, from https://expmag.com/2020/01/the-inevitable-rise-of-the-hologram-rock-concert/

NickA147 & Instructables. (2018, April 13). Hologram projector with pi. Retrieved April 29, 2021, from https://www.instructables.com/Hologram-Projector-With-Pi/