EM
SEE

IRB
Statement

The project is not systematic investigations. It will not collect data from Cal Poly students or employees as subjects. It does not attempt to answer research questions. Therefore, this project does not need to be reviewed by the California Polytechnic State University Institutional Review Board.

About
Jaclyn Napoli

SENIOR PROJECT

- Graphic Communication
- Design Reproduction Technology

- Cal Poly Softball Alumni

This quarter I am testing my skills with UX/UI as I am developing a smart phone application for my senior project.

The purpose behind this application is for my mentor and brother, Joseph Napoli, who is a first responder for the Los Angeles County Fire Department. As he is protecting people in need of service, I can to my part in developing an application that can assist him.

This is an opportunity for the community to be of service to people in need by being perceptive of their surroundings on the road.

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Abstract

To create an application that achieves safety on the road for first responders and bystanders through the use of location in GPS navigation and volume control.

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This app would signal smart phone devices in surrounding cars to limit distractions by objectively decreasing their vehicle audio so the public is alert of the first responders driving to their destination.

The project objectives for this hands-free application include a planned design, a productive schedule, and quality of research.

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Problem Statement

To create an application that achieves safety on the road for first responders and bystanders through the use of location in GPS navigation and volume control. This app would signal smart phone devices in surrounding cars to limit distractions by objectively decreasing their vehicle audio so the public is alert of the first responders driving to their destination.

There is a short amount of time to process where the emergency vehicle is once you see lights or hear sirens. However, if one or both of these senses are impaired by distractions of the bystander, this could result in danger of others, confusion, or even delayed time for the person in need of assistance.

This is an opportunity for the community to be of service to people in need by being perceptive of their surroundings on the road. We all want to be of service to first responders, as if they were on their way to help you.

Project
Objective

Design

A careful planned design that would work across all platforms.
A identifiable color scheme and typography that would target the audience as importance.
A design that is easy to use and navigate through.
Keep it simple.

Productivity

Set deadlines and meet the standards I will make for myself throughout the quarter.
Be open for adjustments from outside perspectives that could benefit the application strategy.
Frequent check-ins with the professor to set myself on the path to success.

Quality

Do my research
Conduct interviews with the responders who drive emergency vehicles to meet their needs as a bystander for better application construction.

Project
Timeline

Week 1   9/20
Problem Statement, Project Objectives, Deliverables,
Background Research

Week 2   9/27
Planning, WBS & Gantt chart, Risk and Scope Statement

Week 3   10/4
Low Fidelity wireframes, Project Proposal Presentation

Week 4   10/11
Begin high fidelity wireframes

Week 5   10/18
High fidelity wireframes, draft project proposal

Week 6   10/25
Finish high fidelity wireframes, begin prototype

Week 7   11/1
Test prototype, revise wireframes after testing

Week 8   11/8
Showcase Poster Due and Print

Week 9   11/15
Senior Showcase Presentation

Week 10   11/29
Process book and project reflection

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Background Research

1. Waze: What is it, and how many people use it

Waze is a GPS navigation software app and a subsidiary of Google. It has been an application on the market since 2006 with 130 million monthly active users. It works on smartphones and tablet computers that have GPS support to tell you about traffic, construction, police, crashes, and more in real-time. It provides turn-by-turn navigation information and user-submitted travel times and route details. While this applications has many pros of being bright and colorful with easy-to-see icons and a good social connections for drivers, many users say cons include its difficulty to create directions from places other than your current location, it lacks terrain, satellite, or 3D map imagery, and Waze has no true offline options.

2. PulsePoint Respond

PulsePoint Respond is a 911-connected mobile app that can immediately inform you of emergencies occurring in your community and can request your help when cardiopulmonary

resuscitation (CPR) is needed nearby. The PulsePoint Respond app, the North American standard in alerting willing bystanders to CPR-needed events, is currently in more than 4,000 communities and has built a network of more than 2.5 million subscribers. With this application, there is some room for improvement with daily users wanting more with filtering the specific engines they want to follow.

3. Google Maps

Today, over a billion users use Google Maps every month and send more than 20 million suggested updates daily. Google Maps is a web mapping platform and consumer application offered by Google. It offers satellite imagery, aerial photography, street maps, 360° interactive panoramic views of streets, real-time traffic conditions, and route planning for traveling by foot, car, air and public transportation. Some researched disadvantages, there are flaws of limited accuracy, the application is used by criminals, and offensive and shocking material from its 3D street view camera.

4. Reuters:

In this article, author Andrew M. Seaman gives a description of the average wait time it takes for an ambulance to get to their destination. He notes, "On average in the U.S., the length of time between a call for help and the arrival of emergency medical services is about eight minutes - but that rose to 14 minutes in rural areas (where about 10 percent of patients waited nearly 30 minutes), researchers found." He doesn't mean to put the rural emergency responders in a bad light, yet

it is just a fact in today's world. He also states that what could help this waiting time would be for citizens and bystanders to learn small acts of medicine like CPR to possibly save someone's life.

5. U. S. Department of Transportation National Highway Traffic Safety Administration Office of Emergency Medical Services (EMS)

In this report, Dr. Douglas Kupas, EMS physician and emergency physician, studies and describes the usefulness of sirens and their effectiveness. This report begins by exploring the traditional reasons for lights and siren use by EMS. Dr. Kupas states, "If one pays attention to when one first sees an emergency vehicle approaching head on or approaching when traveling at highway speeds – many are amazed at how the vehicle's siren is not heard until they are very close." With this statement, they conducted studies where they measured the distance at which a driver could hear the siren of an ambulance approaching in different variables.

6. Why You Always Turn Down the Radio When You're Searching For an Address Behind the Wheel:

This online article by Elizabeth Millard explains the reasoning why a quiet car could help us see better. There is a common agreement that people tend to turn down the volume of their cars in order to see better on the road. This article explains, "After performing MRI tests on 32 participants, the researchers discovered that when people were focusing

on something visual, the responsiveness of their auditory nerves—which enable you to hear—decreased." With the drop of these auditory nerves, this is the brain's way of prioritizing tasks when one is trying to concentrate.

7. Market Research Future

In search for an innovative automotive future, Bluetooth is the most-trusted wireless connectivity in the world. Bluetooth technology helps to stream audio, transfer data, and broadcast information between devices. Besides, in the automotive industry, Bluetooth is also used to monitor, diagnose mechanical and electrical systems, which enhances the safety of the vehicle. This article states how fast the market is growing by providing statistical infographics and data such as, "Bluetooth in the automotive market is estimated to register a CAGR of 15% during the forecast period." The report scope shows the automotive Bluetooth market size, historical data, key market drivers, and more to ensure the growth of this technological advancement.

8. AAA study: Hands-free connectivity still dangerous

In this article, published by Phil LeBau through CNBC, describes the study of how safe hands-free connectivity really is to drivers. This study showed that drivers using voice-activated systems had slower reaction times and increased levels of distraction. Peter Kissinger, CEO of AAA Foundation for Traffic Safety, tries to defend the technology by stating, "The level of distraction depends on how complex the system

is within a particular vehicle," Kissinger said. "When drivers have to give numerous commands and their mental workload goes up, their level of distraction goes up." A knowledge fix for these technologies would be to lower the rate at which someone would need to command the application.

9. Hundreds of Thousands of 911 Calls Are Made Each Day

This article by Walden University shows interesting facts about the 911 system that many people are uninformed of, including the rate of how many 911 calls are made in a day. This article states, "In an average year, around 240 million 911 calls are made in the U.S.. That averages out to over 600,000 calls per day." Although they say not all 911 calls are emergencies, there are still many citizens that feel in danger and in need for assistance immediately.

10. How long it takes to process sound. Ears Don't Lie

In this article, Molly Webster believes that auditory speed is our evolutionarily-shaped emergency response system. She states, "Hearing is our fastest sense. Horowitz says that it takes our brain at least one-quarter of a second to process visual recognition. But sound? You can recognize a sound in 0.05 seconds." With the trust that our auditory senses bring, that brings question to our sight. There are fallacies that can be pronounced when driving such as blind spots, and optical illusions that the ears can't mistake.

Project Planning

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Work Breakdown Structure

September 28, 2021

The Work Breakdown Structure was important in deciding how I was going to proceed with this project. It was important to plan my work before starting as it outlined the aspects that needed to be covered.

Gantt Chart

September 28, 2021

The Gantt Chart was a great way to stay organized and on task each week as it corresponds to my Work Breakdown Structure. Every time I completed a milestone I would update my Gantt Chart to make sure I was staying on task and would not fall behind.

Project Constraints

Software and hardware is my biggest limitation. This includes how the audio canceling can connect to smart phone devices in a near by range. This can be done, but not with the technology I have on hand.

Project Assumptions

The information that is not known at this time is how much technology it would take to create this audio canceling signal through GPS navigation. There are resources that can be researched to gain insight on this technology since it is a possible feature.

Process

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Survey with Qualtrics

October 11, 2021

The following were some important questions that were asked to students, family, and friends as feedback for how I would continue to shape my project. The survey was sent out on October 11 and I received 90 responses within a week of the survey being active.

Which navigation application do you use the most?

- Apple Maps
- Other
- Waze
- Google Maps
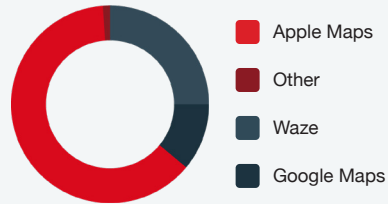
Do you have Bluetooth capabilities in your vehicle?

- Yes
- No

Do you allow trustworthy apps to track your location?

- Yes, only while using the app
- Yes, indefinitely
- Never
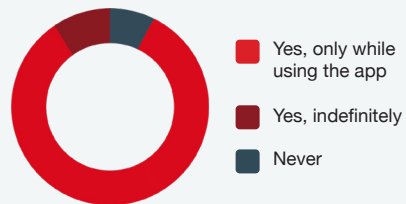
Have you ever NOT heard an emergency vehicle while they were driving past you?

- No, I always hear them
- Yes, sometimes I don't hear them
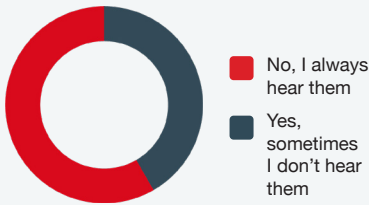
Based on your response, why?

What Matters

This was the most important question, as it is the premise of this application design. The majority of those who responded said, "No, I always hear them" on a 58.14% to a 48.86% rate. This is still a big enough margin for change as we should always change in matters of an emergency.

Low Fidelity Wireframes

Sketchbook

September 28, 2021

This is where I first started to implement my ideas onto paper. I had a set idea with a simplistic feel maintaining only three navigation buttons on the lower part of the screen. There are some arrows that demonstrate movement with animations in the screen once the application is up and running.
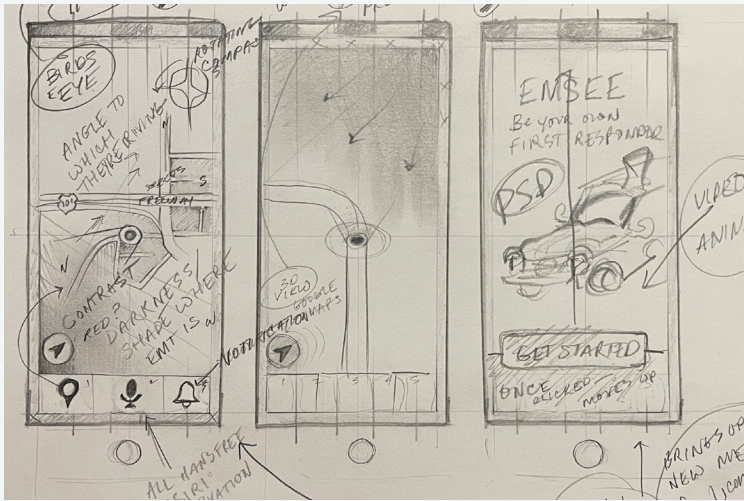
The following applications were used in the completion of this project:

| Balsamiq | Illustrator | InDesign | Adobe XD | Photoshop |

Balsamiq

October 8, 2021

This was my first time using Balsamiq and I felt that it was very easy to use and navigate. As I started to put my ideas on the computer, a lot more creativity was sparked as I thought of the idea of having a red hue for the EMT's location on the app.

Progress Report

Manage Project change and practice project documentation

October 28, 2021

Throughout this project, I have not found any changes needed that would affect my timeline or project outcome. My plan from the start seems to be on task and headed towards the right direction.
My scope creep seems to be the background research needed in order to be able to incorporate GPS Navigation and Audio Interference. Along with this, I am learning the ways of a new software (Adobe XD) and it is taking me longer than I should to navigate through it.

Deliverables

Revisit the Gantt chart and Project objectives, compare the current progress with the original schedules.

Problem Tasks

1. Some incomplete tasks that are running late includes the research planned to investigate further into GPS navigation and audio interference research.

2. According to my Gantt chart, I should have started my marketing strategy this week, yet I am still finalizing my high fidelity wireframes at the moment.

3. I haven't completed as much work in the background research. This is something that I have anticipated. However, I am learning more everyday about Adobe XD so it is taking me longer to produce my wireframes. If I were making these in Photoshop, they would have been done a lot sooner.

Scope Creep & Mitigation

1. The causes of the scope creep would include trying to learn new software for this project. It has taken me longer than it should and not producing the results that I want in a reasonable time.

2. The more time spend in the new software, the better I am at navigating through it. My mitigation plan is to spend more time during the week days and weekends to learn more and practice. I also need to come to a conclusion on my wireframes instead of thinking "what else could I add".

3. Project Deliverables (Revised) include: Hands-free cross-platform smart phone application, an aesthetically pleasing application design capable of being used by all drivers and passengers, and a marketing campaign that includes an overview of our purpose, usability, and media channels the product will be marketed through.

High Fidelity Wireframes

Flow 1 🔗
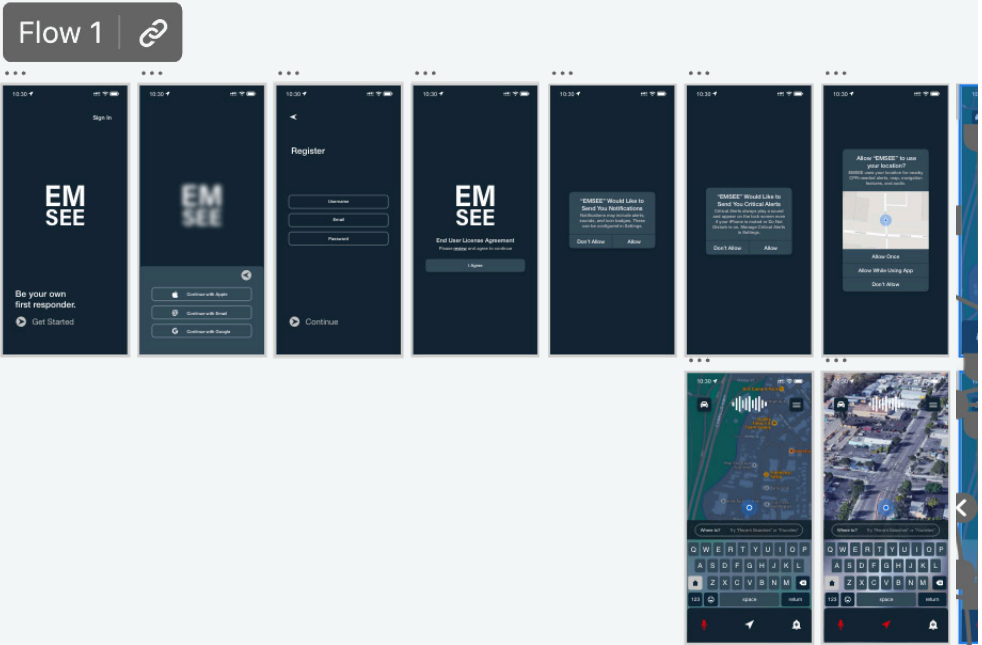
Adobe XD

October 18, 2021

This was my first time using Adobe XD but it was convenient how all of the Creative Cloud applications sync together. With this, I had all of my color and type ready to use within this app. The image on the left shows the design view of the mock up while the image on the right shows the prototype view. To really narrow down my decisions it took me a couple of weeks to draft ideas on Adobe XD and see if they worked. This concluded in five different mock up designs that built on eachother to produce the latest one that I am the most satisfied with.
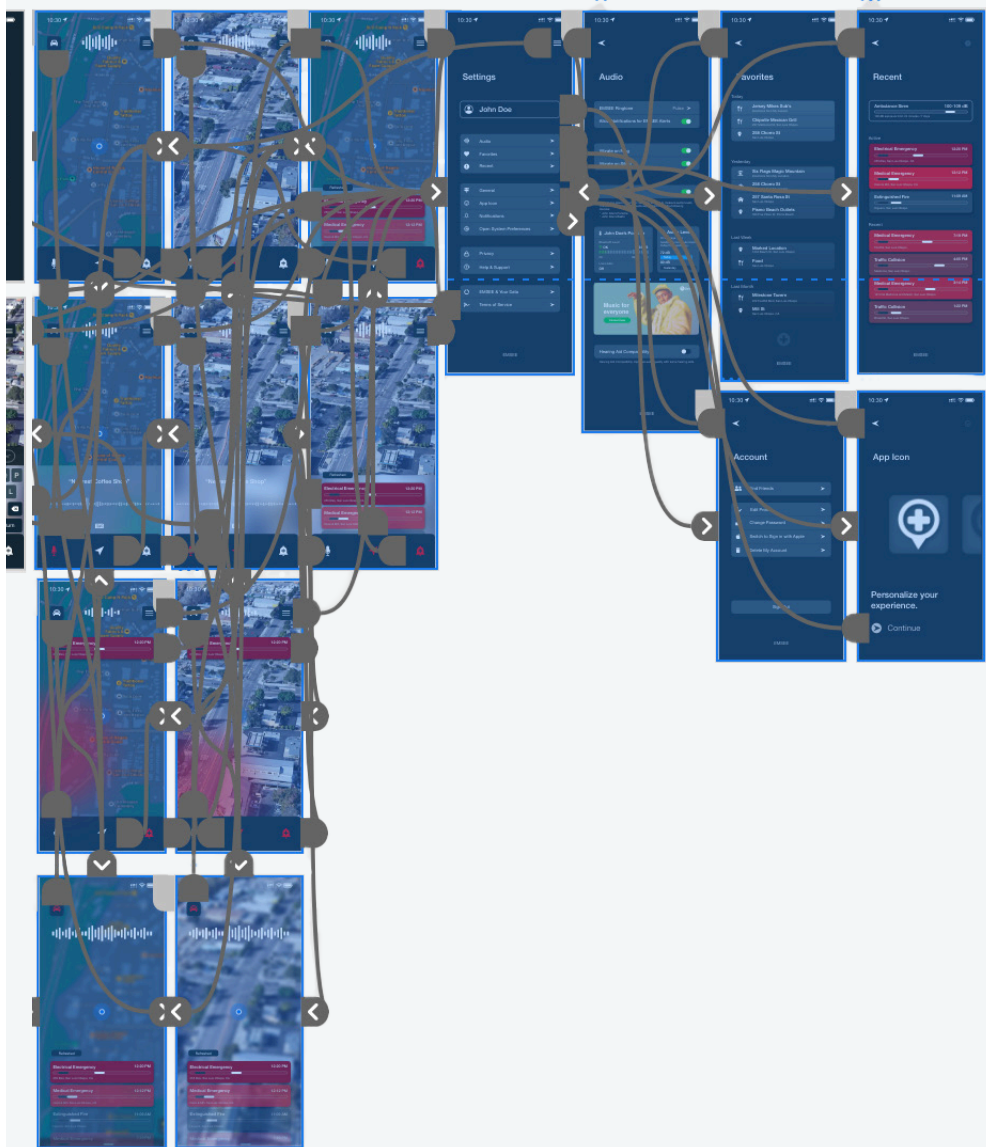
Log In

The user has the option to login through Apple, Email, or Google for convenience. If the user does not have an account, they would register as a new user.

Scan here to access prototype

Sign In

EM
SEE

Be your own
first responder.

Get Started

Register

Username

Email

Password

Continue

Continue with Apple

Continue with Email

Continue with Google
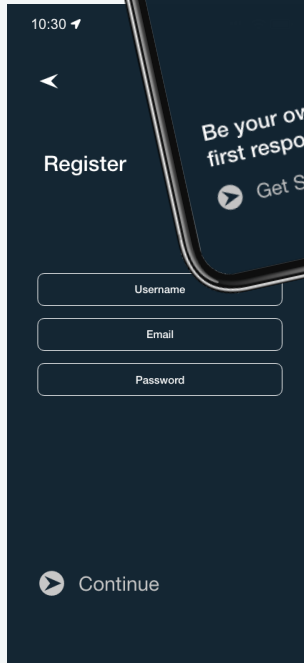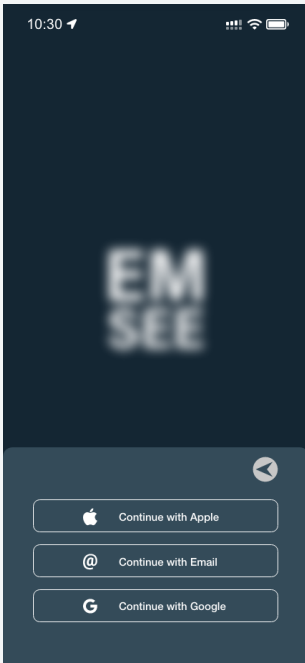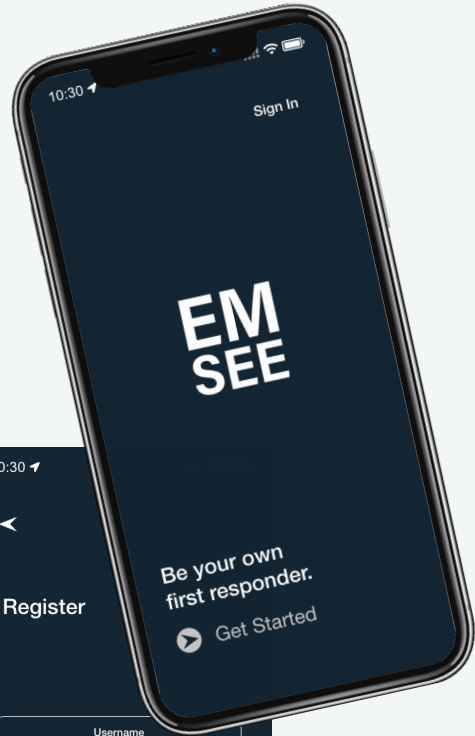
License Agreements

The License Agreements followed the login page and are important for the user to know that their personal information is protected and can be trusted by this application. All can be configured in settings based on personal choice.
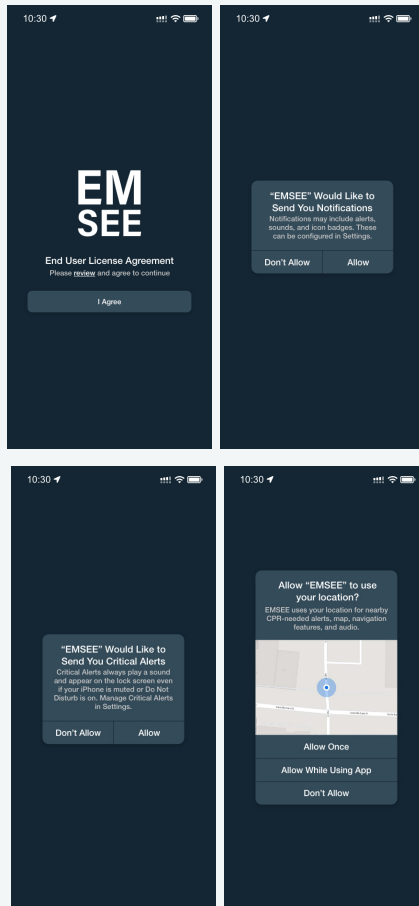
Home

This displays the home screen of the application. The user has the option to toggle between street view or an aerial view of the map from any page they are on. This can be done with the middle arrow button on the bottom of the screen.
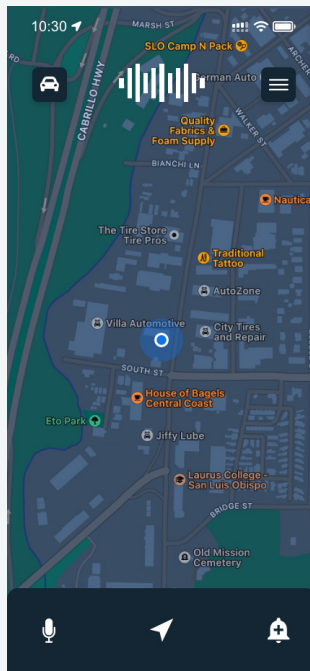
Street View   Aerial View
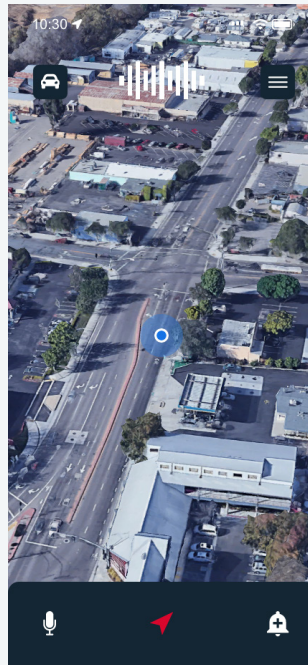
Microphone

Once the microphone button is tapped, there is an automatic Siri control to pursue the hands-free navigation strategy. If the user needs the keyboard, there is an option to select that as well.
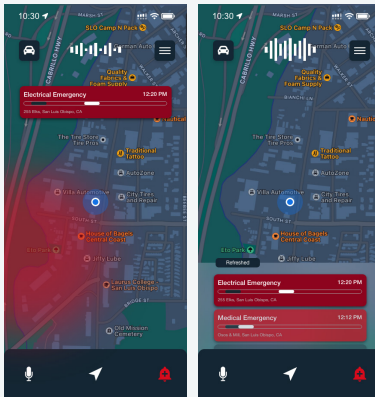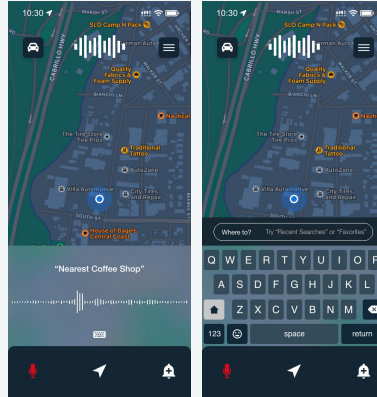
Alerts

The third button is for alerts in the area. This shows the user to see a refreshed notification of the emergencies near by. Once the emergency is close enough in range from the navigation system, the second screen will come up as an emergency. The red hue is the direction that the EMT is coming from and your audio levels will decrease.

Car View

The top button in the shape of a car enables car view. This is to also limit accessibility to the app while users are on the road. This can also be configured in settings.

Settings

This is where the user can personalize their application along with receiving feedback on audio levels. There are options to add favorite locations and even change your application icon.

Screen 1 — Settings

10:30

Settings

John Doe

- Audio
- Favorites
- Recent

- General
- App Icon
- Notifications
- Open System Preferences

- Privacy
- Help & Support

- EMSEE & Your Data
- Terms of Service

EMSEE

Screen 2 — Audio

10:30

Audio

EMSEE Ringtone	Pulse ➤
Allow Notifications for EMSEE Alerts	●

Vibrate on Ring	●
Vibrate on Silent	●

Measure Levels ●

Your device does nt record or save any sounds to measure audio levels. The EMSEE app measures audio exposure through the following devices:
• John Doe's Porsche
• John Doe's Beats

John Doe's Porsche

Bluetooth Level
OK   35 dB
20   80   110

Live Listen
Off

Audio Levels

On Average, your headphone level was lower today than yesterday.

72 dB
Today
80 dB
Yesterday

Music for everyone
Connect now
Spotify

Hearing Aid Compatibility	○

Hearing Aid Compatibility improves audio quality with some hearing aids.

Favorites

Today

🍴 **Jersey Mikes Sub's**
Directions from My location

🍴 **Chipotle Mexican Grill**
297 Madonna Rd, San Luis Obispo

📍 **258 Chorro St**
San Luis Obispo

Yesterday

🏛 **Six Flags Magic Mountain**
Directions from My Location

🏠 **258 Chorro St**
Directions from My location

🏠 **257 Santa Rosa St**
San Luis Obispo

📍 **Pismo Beach Outlets**
333 Five Cities Dr, Pismo Beach

Last Week

📍 **Marked Location**
1234 Beach St, San Luis Obispo

🍴 **Food**
San Luis Obispo

Last Month

🍴 **Milestone Tavern**
972 Foothill Blvd, San Luis Obispo

📍 **Mill St**
San Luis Obispo, CA

EMSEE

Recent

Ambulance Siren   **100-109 dB**
100 dB exposure limit: 24 minutes / 7 days

Active

Electrical Emergency   12:20 PM
255 Elks, San Luis Obispo, CA

Medical Emergency   12:12 PM
Osos & Mill, San Luis Obispo, CA

Extinguished Fire   11:09 AM
Higuera, San Luis Obispo

Recent

Medical Emergency   7:19 PM
Foothill, San Luis Obispo

Traffic Collision   4:05 PM
Madonna, San Luis Obispo

Medical Emergency   3:14 PM
101 N & Madonna and Marsh, San Luis Obispo

Traffic Collision   1:22 PM
Broad St, San Luis Obispo

EMSEE

Marketing Goal

To reach new customers, increase brand loyalty, and eventually exceed competition. The budget of this project would be based on partnerships made in order to increase brand name and sales. Along with these partnerships, this would give convenience to the customer.

Target Audience

This application applies to all drivers.

What's next

Next is to expand reach to the audience that is loyal to other applications. These applications are all competition including Apple Maps, PulsePoint, Waze, Google Maps and more. A great way to expand our connection to the audience would be through digital media marketing.
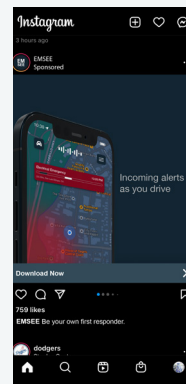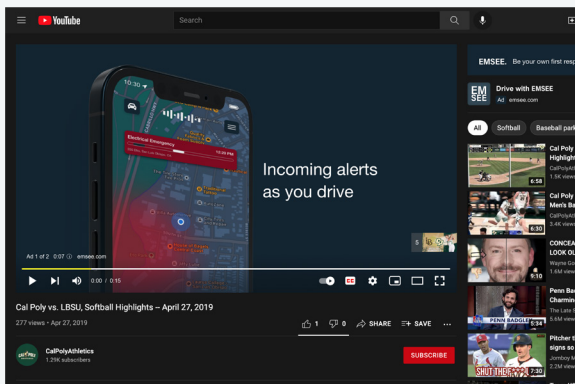
End Goal

To be the most trending app on the app store.

Reflections

The Finish Line

November 30, 2021

This project has really been a test of my capabilities throughout the quarter. The class has been put to the test of perseverance, concentration, and dedication to which I feel I successfully accomplished in these past 10 weeks. The techniques I used to get me to the finish line include acknowledging my competition, staying on task, and getting ahead.

Acknowledging my competition

When I acknowledged my competition, it allowed me to develop a realistic approach which led me closer to my in-scope capabilities. I downloaded about 10 similar applications on my phone and navigated through all of them to see how I would want my application to function. Along with functionality, it also influenced my design on simplicity, aesthetics, and trends that made their applications so great.

Staying on task

Staying on task was made simple by the timeline that Dr. Ma made us draft up in week one. At that time, I did not know how much I was going to get done at the time, but by having

frequent check-ins and staying loyal to my timeline, it was possible to complete. The Gannt Chart was very important in the progress during the weeks that people might get comfortable in. That chart held me accountable and made me gain perseverance in completing the work and meeting the standards I set for myself.

Getting ahead

By getting ahead, I would work on as much as I could accomplish during the week. Even if the section was not listed in the milestone, I would still attempt to work or develop ideas on the subject. This also allowed me to save me the most amount of time. Throughout the quarter, I never felt rushed or in need of more time during the day. I actually had the opportunity to take a week off from the project. In the week taken off, it allowed me to reconcile new ideas that existed out of the tunnel vision of my screen. It also gave me the drive to get back to the project and make it great.

Challenges

The most difficult challenge I had during this project would have to be the indecisiveness I faced when creating the design of the application. There were times that my mind was flowing with ideas that I could not get on screen. There were also times where I developed an idea of a design and I looked back at it a week later and hated it. I felt as if I could never settle for a design, and I still can't. As for my artistic background, I feel there can always be something done with

a work of art, and that is exactly how I felt in designing this application. What helped me with the design of the application was remembering to keep it simple. By this, I remembered that the most important part of the design is the simple functionality by developing a hands-free application. With this, it allowed me to limit the noise that I wanted to add and to just simply keep the design clean. Another thing that helped me was referencing my competing applications. They also had a simple approach and consistent color scheme which allowed me to narrow down my ideas to just one design.

Some other challenges I faced was learning new applications for the first time along with devoting my time to more important things. This was my first time ever using Balsamiq and Adobe XD. I really enjoyed these applications once I got the hang of them, however, I consumed valuable time learning how to navigate through them. I would spend a lot of time on YouTube learning tutorials of applying cool transitional functions to my app while that time could have been spend to more important things. I would watch countless videos on cool effects that weren't even applied to the final product of my application. I felt as if I kept going back and forth during the project instead of just a straight line. Next time, I am planning on sticking to the tasks I need to get done first, and then adding the special effects at the end.

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