Project Plan Presentation
Crowd-Sourced EV Emergency Recharge

The Capstone Experience

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Fall 2021
Functional Specifications

• Our mobile application aims to provide peace of mind to owners of fully electric vehicles
• When owners of fully electric vehicles are stranded on the road due to lack of charge, they can use our application to ask for assistance
• Nearby owners of fully electric vehicles can respond to requests for assistance on the app and assist those who are stranded for a given price
Design Specifications

• Our application will have a Help Center that will allow owners of fully electric vehicles to ask for and provide assistance via ‘Help Requests’

• The application will send push notifications to alert users to new Help Requests or to provide users with updates on their current Help Request

• The application will include a navigation screen that users will use when traveling to each other

• The application will include the ability for fully electric vehicle owners to call and chat with each other during a Help Request
Screen Mockup: Home Screen
Screen Mockup: Submit a Request

Submit a Request

Select your destination:
713 Hannah Boulevard, East Lansing 48823

Confirm your current location:

What vehicle are you currently driving?
2021 Mustang Mach-E
License Plate: DKT6034

Select

2022 F-150 Lightning
License Plate: GSZ2095

Select

Submit Request

Cancel

Offers of Assistance

Edit Request Details

Cancel Request

Your pending offers of assistance:

Chris ★ (4.7)
10 Miles Away
Offering to charge your vehicle for: $75.00

View

Cassidy ★ (4.8)
6 Miles Away
Offering to charge your vehicle for: $90.00

View

Devin ★ (4.3)
10 Miles Away
Offering to charge your vehicle for: $120.00

View

Request Pending

Your help request is pending
We will notify you when someone responds to your request

Your destination:
713 Hannah Boulevard, East Lansing MI 48823

Your current location:
415 Farm Lane, East Lansing MI 48823

Your vehicle:
2021 Mustang Mach-E
License Plate: DKT6034

Cancel Request

Back
Screen Mockup: Offer Details

Chris has offered to assist you
10 miles away
ETA 6:53
⭐ (4.7)

Chris will charge your vehicle up to 13% for a cost of $75.00

Accept Offer
Deny Offer
Cancel Request
Back
Screen Mockup: Offer Assistance

Request Details

Samantha is requesting assistance
10 miles away
Samantha is driving a 2021 Mustang Mach-E and needs 10% charge to reach their destination

Select your vehicle:
- 2021 Escape SE Hybrid 87% Change
- Estimated charge duration: 20m
- Estimated charge after providing assistance: 70%

Enter an amount to charge: $75.00

Required equipment for this request:
- SAE J1772 connector
- Yes, I have the equipment required to fulfill this request.

Offer Assistance
Cancel

Pending Offer

Pending offer to Samantha
10 miles away
Samantha is driving a 2021 Mustang Mach-E and needs 10% charge to reach their destination

You have offered to assist Samantha for a cost of $75.00

Your vehicle:
- 2021 Escape SE Hybrid 87% Change
- Estimated charge duration: 20m
- Estimated charge after providing assistance: 70%

Required equipment: SAE J1772 connector

We will notify you when Samantha responds to your offer.

Cancel Offer
Screen Mockup: Current Request
Technical Specifications

- React Native / JavaScript front end
- The Android back end will be written in Java
- The iOS back end will be written in Swift
- Google Firebase services will be used to implement authentication, chat, and push notifications
- The database will be implemented using Google Realtime Database and Google Firestore
System Architecture

Application Back End
- Android
- Java
- iOS
- Swift

Application Front End
- React Native
- JS

Cloud Components
- Firebase Cloud Functions
- Firebase Cloud Messaging
- Firebase Authentication
- Firestore
- Firebase Realtime Database
System Components

• Hardware Platforms
  ▪ Android and iOS mobile devices

• Software Platforms / Technologies
  ▪ React Native front end
  ▪ Swift/Java back end
  ▪ Firebase Services
  ▪ Firestore Database
  ▪ Android, iOS, and Firebase SDKs
Risks

• Implementing Live Push Notifications
  ▪ Risk: Timely push notifications being sent to users based on user settings and location
  ▪ Mitigation: Google Firebase Cloud messaging has the tools needed to implement this feature

• Implementing User Location Screen
  ▪ Risk: Map screen displaying the location of the charge donor and the charge recipient in real time
  ▪ Mitigation: react-native-maps-directions module powered by the Google Maps API

• Maintaining Consistency Across Devices
  ▪ Risk: Our application will be used on a variety of devices for both iOS and Android. We need to ensure that app visuals and performance remain consistent regardless of hardware being used.
  ▪ Mitigation: We are using React Native to build a platform-agnostic front end and are testing our application on a variety of devices and emulators
Questions?