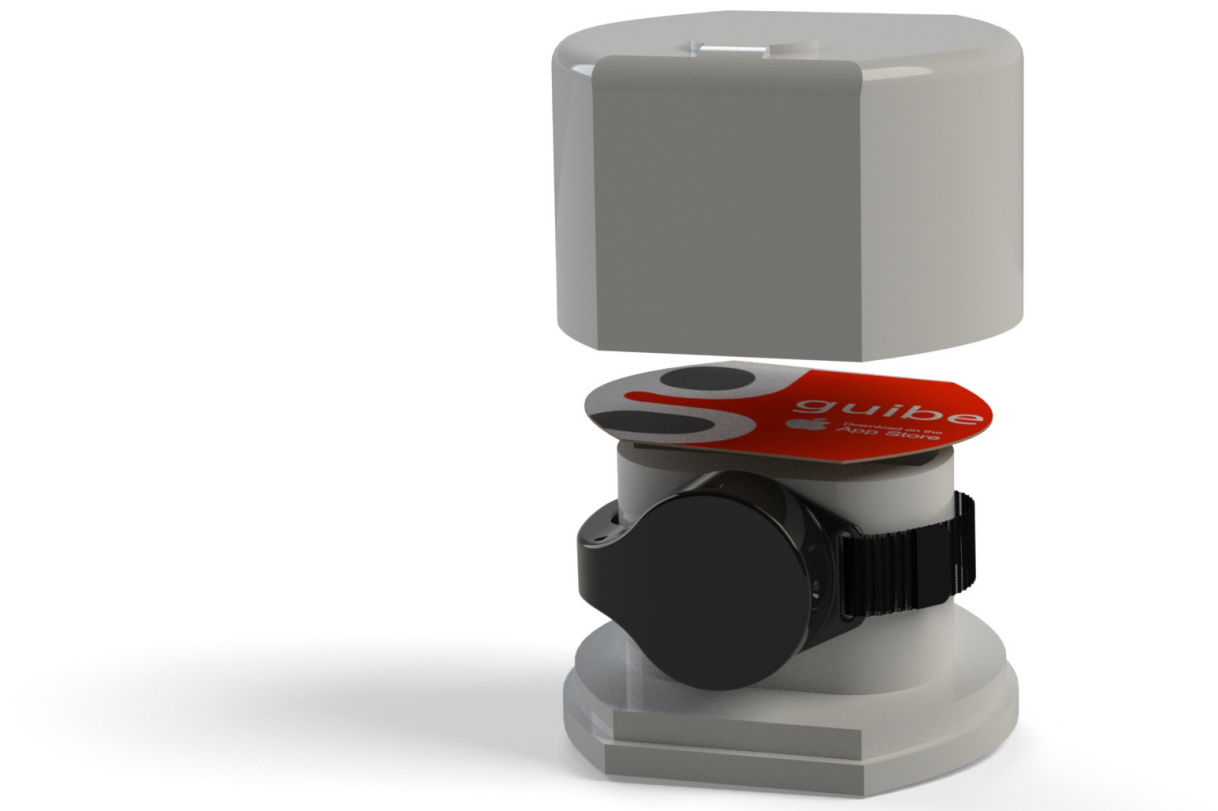
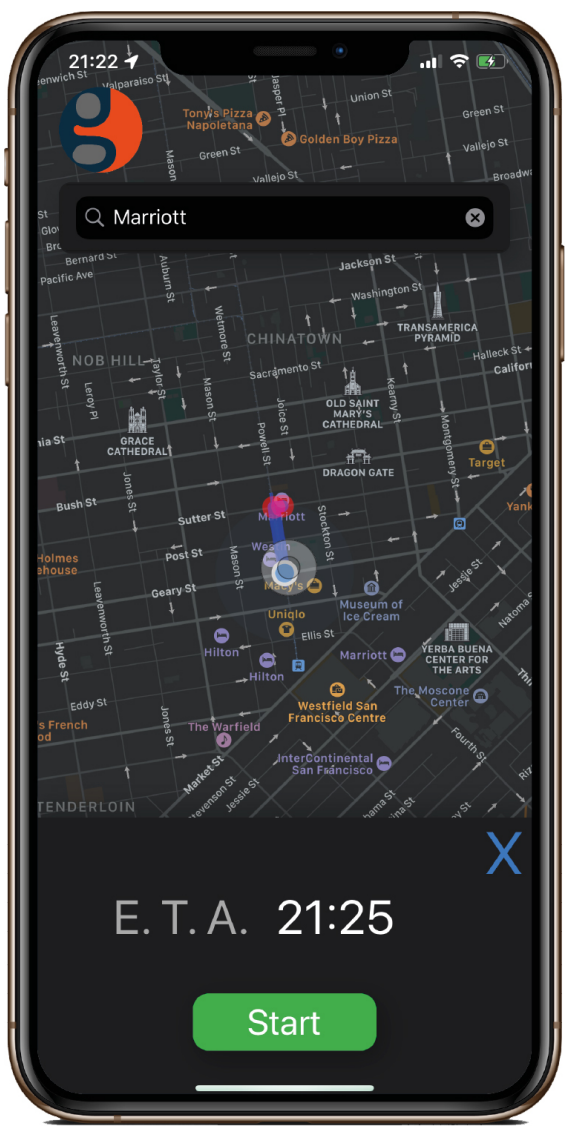
guibe
A new sense of direction



As my main second year project I developed a wearable device that uses haptics to guide a visually impaired user in a city environment.

This was a group project, we split the workload into roles, I chose to be the CTO.
This involved developing the electronics back-end for the bracelet, circuit design, and the iOS app that interfaced with it.

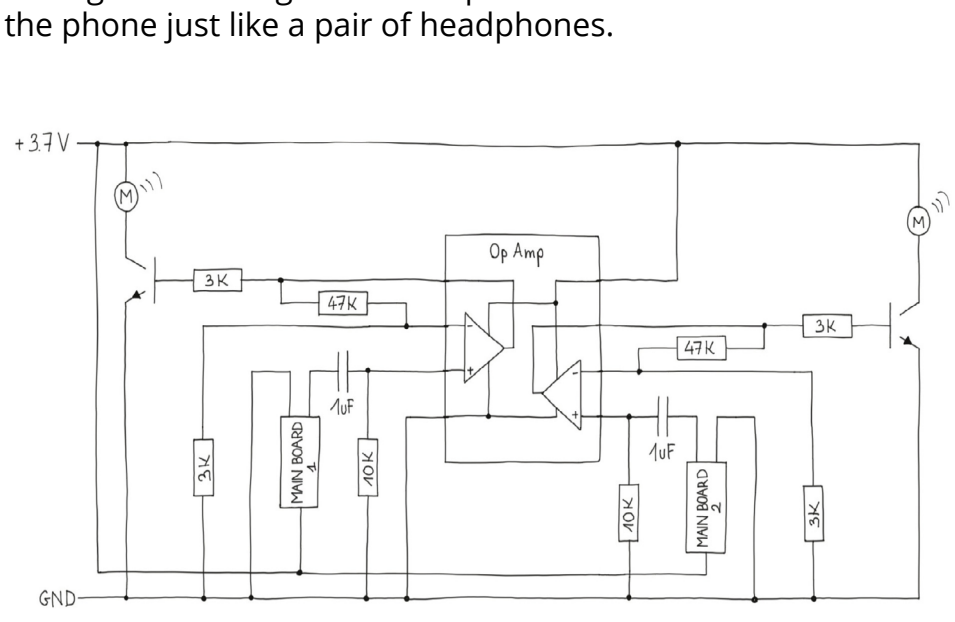


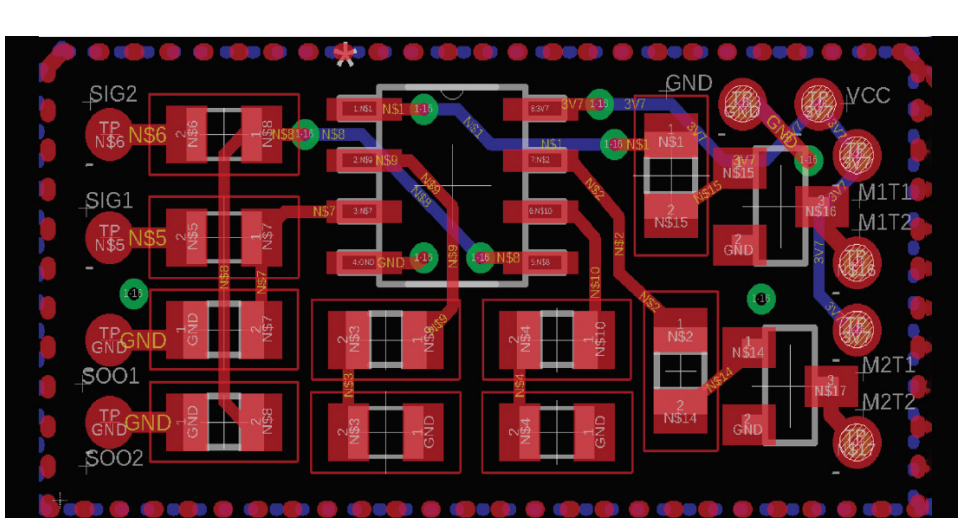
For three months we researched and conducted interviews. We discovered that the most dangerous part of a user's day was the journey, particularly when navigating alone.

To try and solve this problem we decided to eliminate voice instructions completely and use discreet haptics to send turn by turn directions to the user.

The bracelet was designed to interface with an iPhone app. We went with the apple platform because it offers far more accessibility features than any other smartphone and hence the VI market predominantly uses apple products.

To bypass the need for MFI certification, I developed a custom circuit that will amplify analogue sound signals. I then purchased a small bluetooth receiver and connected it to the phone just like a pair of headphones.





For the phone side of the project, I learned Swift and wrote a navigational app (On page 13) that will extrapolate turn by turn directions, and when the user breaks a waypoint geofence it will stream a specific audio haptic recording to the bracelet. If the user started moving in the wrong direction the app would also react and stream a 'Check again' haptic to the bracelet.

The final bracelet was designed to be fully injection mouldable and contained seven components: two bluetooth boards (one for each channel), two haptic motors, the custom PCB, a button and a Li-Po cell.