

# 5m

## SOLUTION

Using a human-centered design process, we interviewed 8 blind and visually impaired participants to understand their current pain points.

We arrived at a combination of obstacle sonification and text recognition to provide users with a greater sense of awareness of their surroundings.

## TEXT RECOGNITION

Once the user has identified something that might have text, they can use the capture and read text commands have it read to them. We take a picture with the Hololens and have it processed via Google's Text Recognition API.

## WHAT'S NEXT

With future improvements, this could be applied not only to navigating public transit, but also airports, grocery stores, schools, museums, and many other spaces, granting blind people a new level of independence in unfamiliar spaces.

## PROBLEM

The GPS is able to guide blind people to the *approximate* location of their target. However, navigating the *5 meters* in between where they are and where they want to go can often be a serious problem.

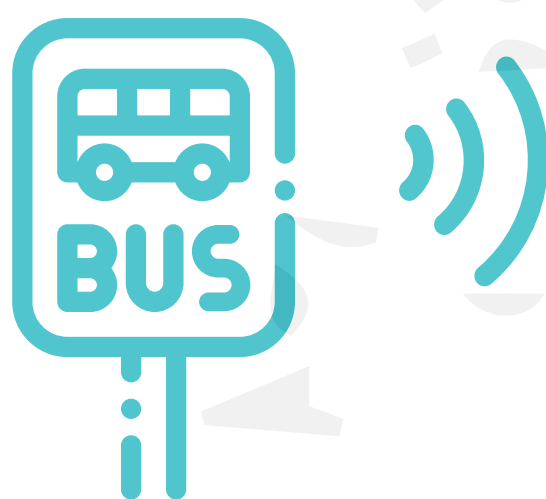


## OBSTACLE SONIFICATION

We use the Microsoft Hololens to generate a 3D map of the user's environment. We then instantiate digital audio beacons onto the 3D mesh to sonify the obstacles in the environment. This sonifies nearby objects, such as bus stop poles.

## USABILITY TESTING

To assess the usefulness of the prototype in assisting blind and visually impaired people in navigation, we conducted 9 usability tests. The participants were asked to find a specific bus stop presented in the form of spatial audio clues and speech sounds.



For people who are blind or visually impaired, the white cane and guide dogs are typically used for navigation.

However, both cane and dog are incapable of communicating *semantic information* in the environment.



Screenshot of Processed Mesh, showing the red obstacle beacons and blue text beacons



Blind participant with her guide dog finding a specific bus stop during a usability test

# AR for VIPs

## Augmented Reality for Visually Impaired People

## OUR TEAM



Rohan Kar, Anu Pandey,  
Alyssa Li, Dylan Fox

**Berkeley**

Advisor: Kimiko Ryokai

SCHOOL OF  
INFORMATION

MIMS 2019 FINAL PROJECT

Thanks to 