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**DEC03200**  
**Assignment 4: Portfolio**

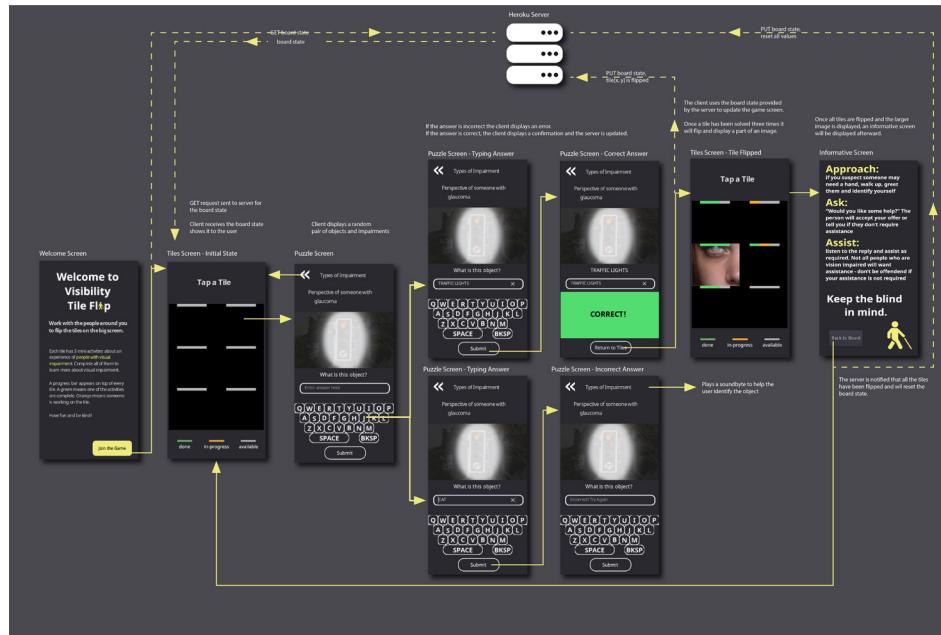
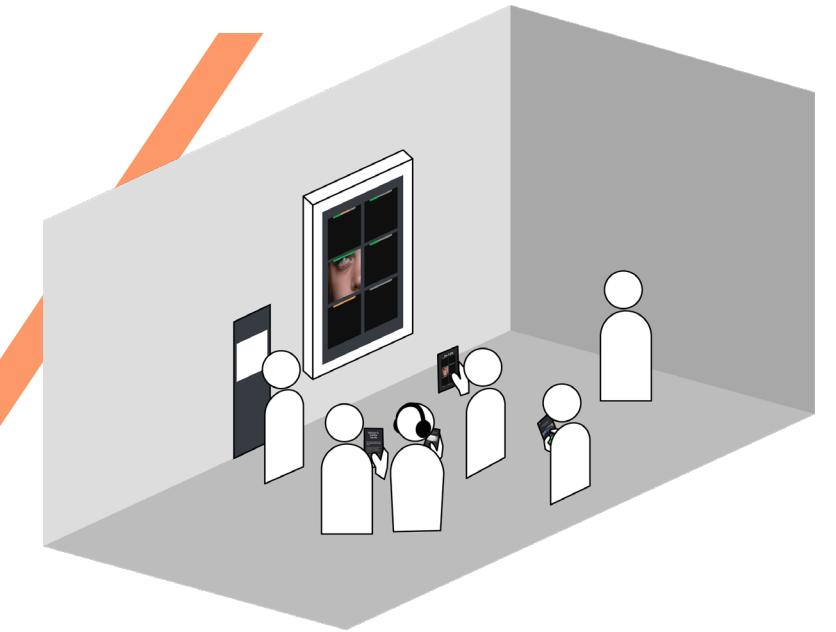
Nicholas Ho | niho5658

# THE PROBLEM

Visual impairment affects a large part of the global community yet despite the opportunities that emerging technologies have on improving their lives, people with visual impairment continue to face a world that is primarily not built for them. Due to this, people with vision impairment are not only physically limited but often have challenges with communication and mental health problems which isolates them from mainstream society.

Therefore, we saw a need for a design that would engage with a wider audience to reflect experiences of visual impairment in order to educate the public on how to approach and help those with vision impairment through empathy.

# THE SOLUTION



# VISIBILITY TILE FLIP

Visibility Tile Flip is a public installation in the form of a large screen that encourages the community to work together in order to gain a new understanding of the struggles of people with visually impaired and how to approach and assist them.

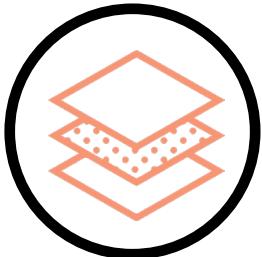
The public can access Visibility Tile Flip by using the mobile device and scanning a QR located at the installation. A web page will be displayed where they can access the mobile app in which they are brought to the home screen. Once they have read the instructions they can proceed to a screen where 6 tiles are displayed replicated on the large screen. A progress bar is displayed indicating which tiles are completed and currently being worked on by other people. By tapping a tile, users are to complete an activity revolving around vision impairment. These include identifying assistive tools and objects through the perspective of various common visual impairments. Tapping on the hint button will play an audio clip to assist you if need be. Once the activity is complete, the progress bar will turn green above the respective tile, indicating that it is complete. The progress bar requires 3 correct attempts to fill up, encouraging you to work with the community to help flip all the tiles. Fill up the progress bar and the corresponding tile will flip revealing part of an image. Flip all the tiles to reveal the image and hidden message about how to approach and assist vision impaired people.

# TEAM STRUCTURE



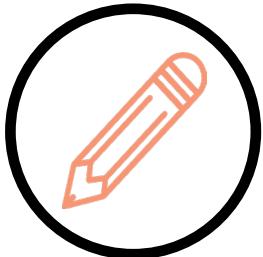
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UI Designer  
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**Andrew Le**

UX Researcher  
UX Designer  
Programmer  
Documentation

## DYNAMIC DESTROYER

My responsibilities for this semester included project management, UX and UI design and contribution towards documentation, background research and user testing and analysing data. Being the project manager consisted of overseeing the entire design process and making sure that deliverables were ready before deadlines and team members were contributing to the workload equally and to a satisfactory level. At the end of every studio, I would list out what needs to be done before the next studio and assign certain tasks to team members while considering the remaining time we have left before the next deliverable is due.

I was in charge of most of the UI and UX design, creating low and high fidelity prototypes. Furthermore, I user tested each iteration of prototypes and identified key insights from each session which I used to improve the following iteration. Every group member contributed to the documentation and background research equally at a satisfactory level.

# CONTRIBUTION

## FIRST ITERATION

For our first round of user testing I created the low fidelity paper prototype for the Visibility Tile Flip (Fig. 1) concept. I put the prototype into the Marvel POP app to test the interaction of screens with users.

After each test, we collected qualitative data from participants in the form of interviews and questionnaires. As a result, we were able to understand their opinions on a more personal level, therefore drawing out more insights. We summarised key findings into an affinity diagram for each concept iteration and map out the pros and cons of each concept to make improvements based on each concept.

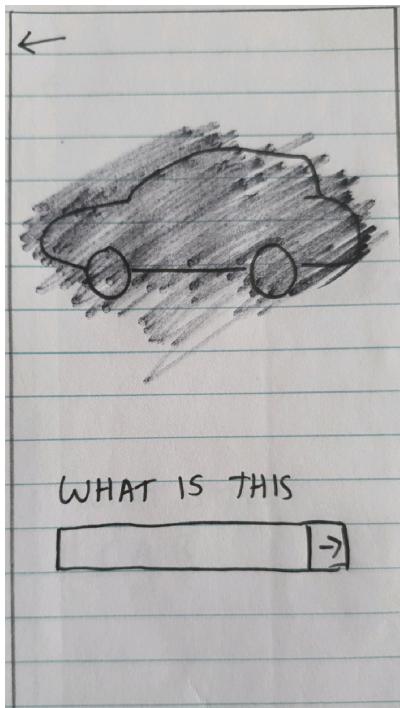


Figure 1: 1st iteration of paper prototype of Visibility Tile Flip Concept

## SECOND ITERATION

Due to feedback from the user testing session of our 1st iteration of concepts, we learnt that users likes the gamification aspect of the Visibility Tile Flip concept. For the next iteration of testing, I created a higher fidelity prototype using Sketch and Invision and improved on the overall layout of the interface to be more intuitive for the user.

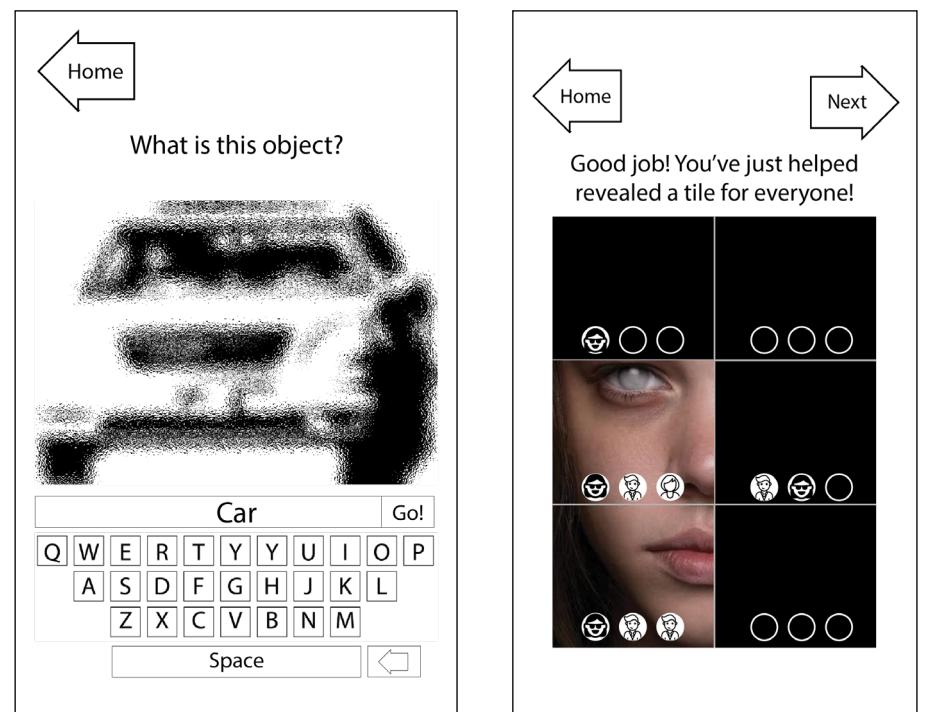


Figure 2: 2nd iteration low-fidelity interactive prototype of Visibility Tile Flip concept

# CONTRIBUTION

I also created the second high fidelity interactive prototype for the Shopping Mall Kiosk Campaign concept (Fig .3). From the feedback from the 1st iteration of testing, we found that concept was strong in conveying the message of how to give clear directions when guiding vision impaired people, however, it lacked motivation to use to use the installation. As a result, I added discounts towards shops searched for as well as improved the aesthetics and added animations to the map.

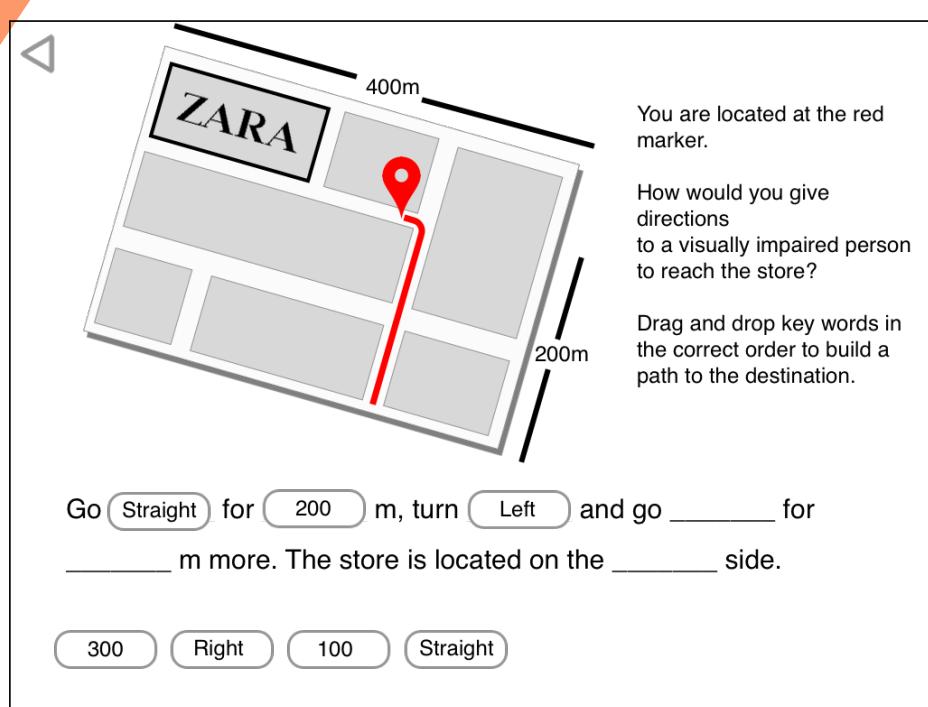


Figure 3: 2nd iteration of Shopping Mall Kiosk Concept using Invision

## THIRD ITERATION

Based on the key insights from the second round of user testing, we found that the message at the end was too text heavy and as a result, users didn't absorb the information and users were confused about how the community aspect was implemented. For our third iteration of the Visibility Tile Concept, I created a high fidelity interactive prototype (Fig. 4) in Figma. I improved the visual interface by using high contrast, added audio hints as a form of interactivity in the app to help users, altered the types of visual impairment activities to reinforce the different perspectives of people suffering from visual impairment and made the message shown at the end easier absorb and more memorable.

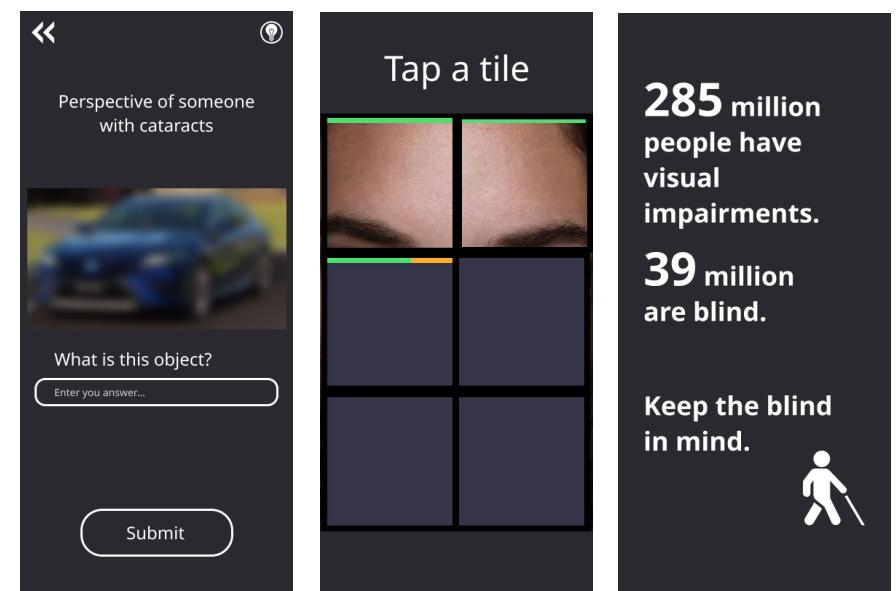
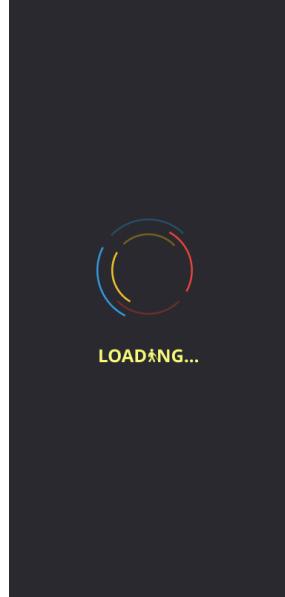
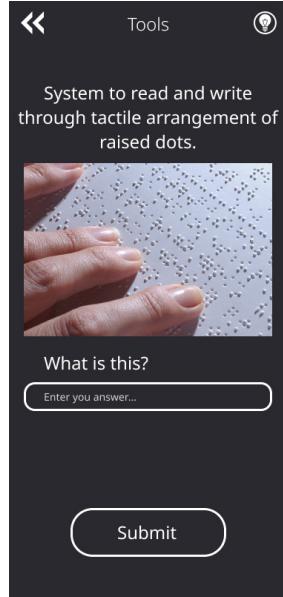
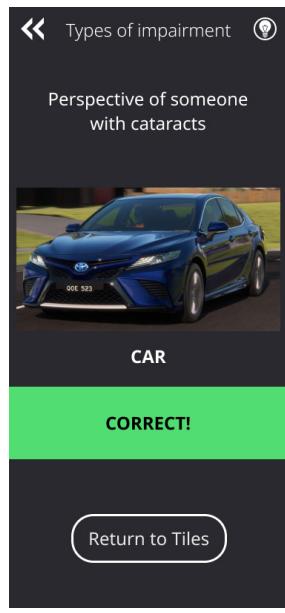
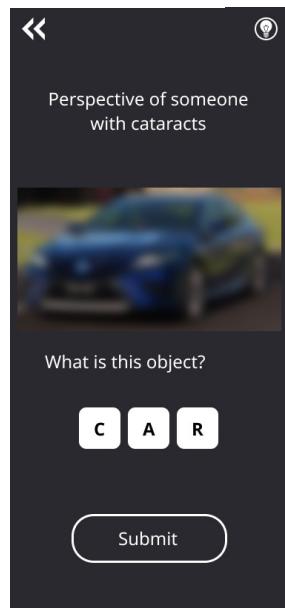
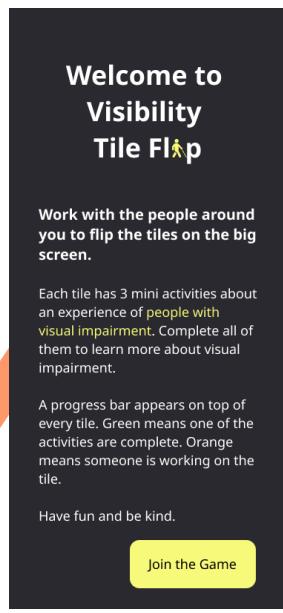


Figure 4: 3rd iteration of high fidelity interactive prototype of Visibility Tile Flip concept

# CONTRIBUTION



# FOURTH ITERATION

For our final iteration of Visibility Tile Flip before the screens are implemented into the Godot game engine to create the app, I added more interactive activities rather than just guessing an obscured object through the lens of someone with visual impairment. This included learning about different assistive tools that aid people who are visually impaired.

Furthermore, I created feedback in the form of loading screen animations, visual cues to notify the user when they select a button and when they successfully complete an activity. A popup will appear on screen when a user presses the hint button to notify them that audio is playing out of their mobile device and to listen to it.

## CHALLENGES

### DESIGNING A MOBILE APP FOR AN EXHIBITION

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We realised very late into the design process that it would be hard to make a mobile application inviting and exciting for people to use instead of creating something that used Arduino's and LEDs. We planned to implement augmented reality into the application so that users could interact with the environment in the lens of vision impaired however, due to time constraints and management were unable to. Our team was not able to overcome this problem and as a result, the app had very plain interactions when presented at the exhibition.

### ONE PROGRAMMER

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We had one dedicated programmer who worked on creating the mobile application from the app screens I created in the Godot game engine. Unfortunately, an unfamiliar program and coding language prevented members from helping code the mobile app. Gabriella and myself were creating and improving the screens as well as finding assets to be implemented into the app while the other member was doing documentation.

# REFLECTION

Communication was one of the biggest issues we had amongst team members throughout the design process. We were communicating and working really well together up until halfway through assignment 2 where we slowly declined. One team member went overseas for a week while another was sick for 2 weeks and as a result, Gabriella and myself had to iterate and user test prototypes without the other members. This led to group members not really understanding where we were up to in the design process. More communication outside of class as well as briefing everyone at the start of the new week could have prevented members from being lost.

One of the members also produced below standard work and did not take the initiative to assign themselves work unless I told them to do it. Due to this, I had to redo and edit a lot of their contribution. This could have been avoided if I monitored and assigned deadlines before the next studio and provided feedback on how they could improve their work.

We will continue to work and improve on Visibility Tile Flip for the graduation exhibition. We plan to implement augmented reality into the app so that users can experience and interact with the environment outside the phone rather than screen based activities. Using augmented reality would involve overlaying filters based on visualisations of types of visual impairments over footage from the user's mobile device camera. We want users to really empathise with vision impaired people by experiencing of they perceive everyday objects when interacting in different environments.



*Age related  
Macular Degeneration*

*Retinitis  
Pigmentosa*

*Diabetic  
retinopathy*

*Cataract*

*Glaucoma*

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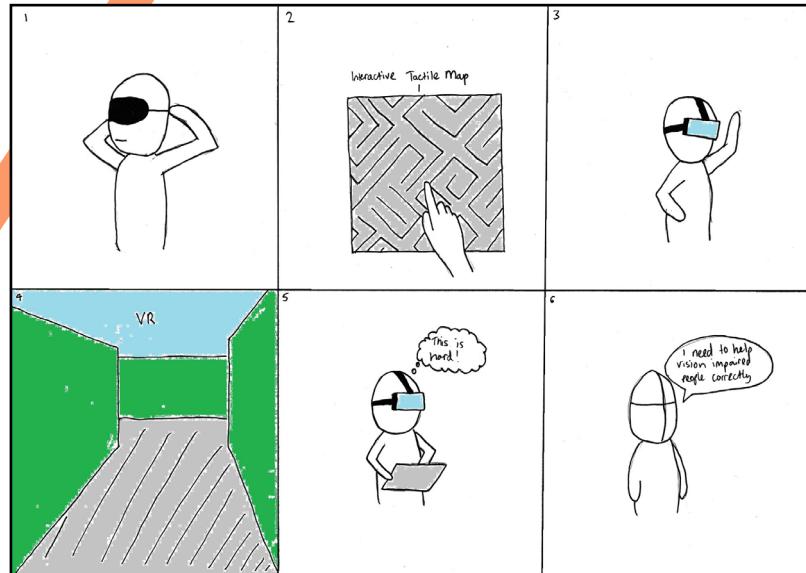
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# APPENDIX



Storyboard for Tactile Maze Concept

The prototype consists of two screens:

- Screen 1:** "Sydney Shopping Mall" title, search bar with placeholder "Search for store...", and a magnifying glass icon.
- Screen 2:** "Sydney Shopping Mall" title, search bar with placeholder "Zara" and a magnifying glass icon, followed by a virtual keyboard.

Two prototypes for visually impaired users:

- Prototype 1:** "Sydney Shopping Mall" title, text "ZARA is over there", and two buttons: "I understand" and "What are you talking about".
- Prototype 2:** "Sydney Shopping Mall" title, text "ZARA is 3 minutes this way", and two buttons: "I understand" and "I dont get it".

Two prototypes for visually impaired users:

- Prototype 1:** "Sydney Shopping Mall" title, text "Go straight for 300m and turn right. Zara is located 3 stores down, 150m from the corner.", and a button "Take a quiz to earn a 10% discount".
- Prototype 2:** "Sydney Shopping Mall" title, text "People with visual impairment navigate the world differently. It's hard for those affected to understand if we communicate using visual cues.", and a button "Take the quiz".

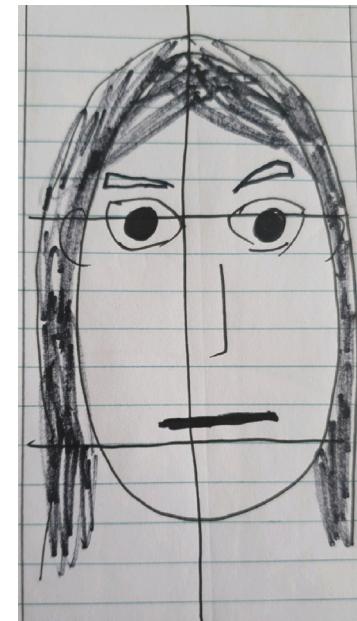
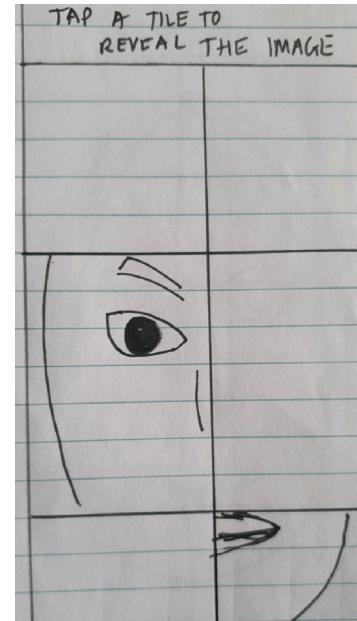
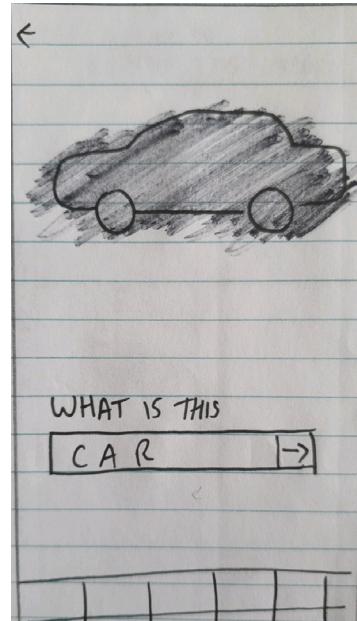
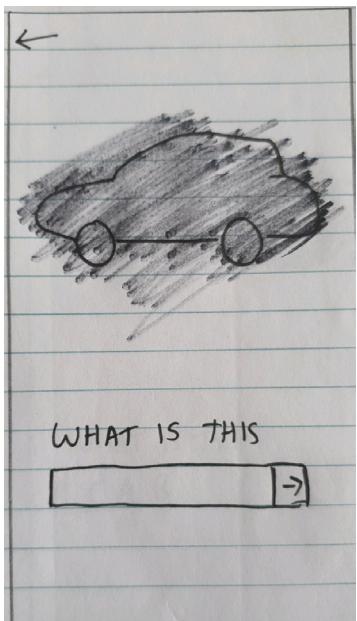
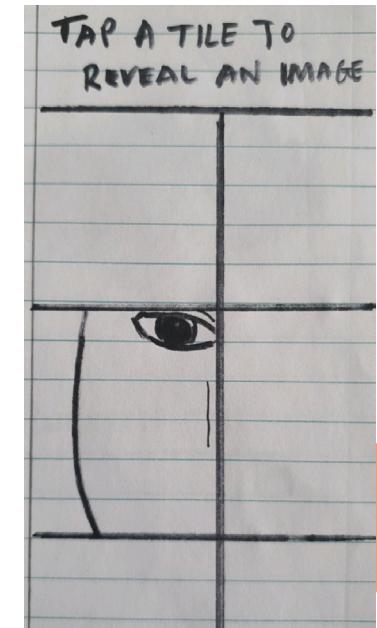
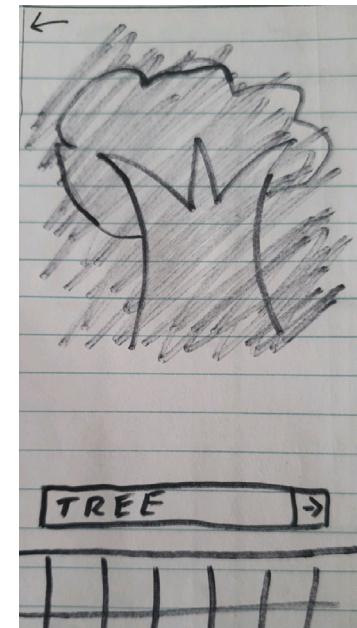
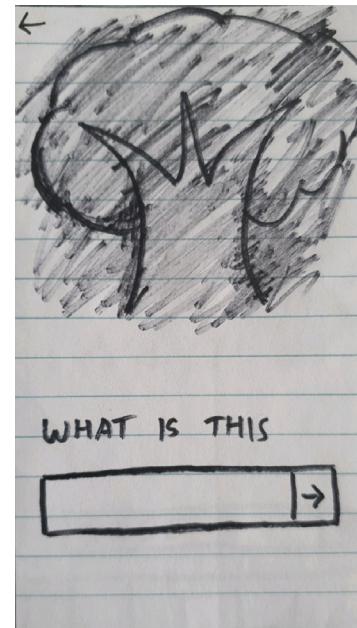
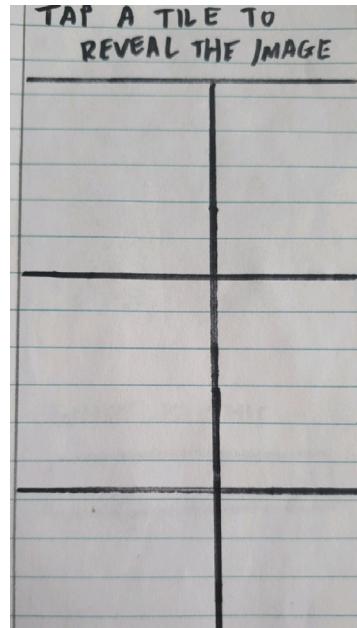
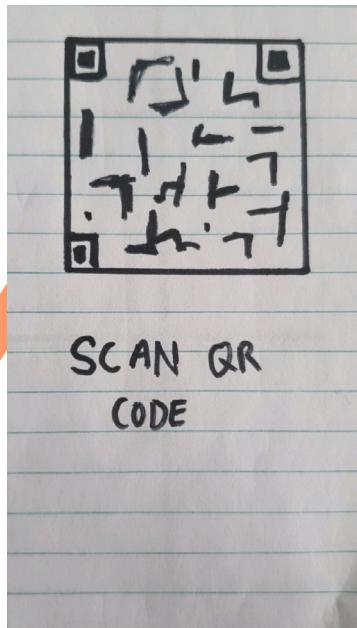
Two prototypes for visually impaired users:

- Prototype 1:** Shows a mall floor plan with a red marker at a store. Text: "You are located at the red marker. How would you give directions to a visually impaired person to reach the store? Drag and drop key words in the correct order to build a path to the destination." Below is a text input field with placeholder "Go \_\_\_\_\_ for \_\_\_\_\_ m, turn \_\_\_\_\_ and go \_\_\_\_\_ for \_\_\_\_\_ m more. The store is located on the \_\_\_\_\_ side." and a row of buttons: 300, Right, 100, Straight, Left, 200, Straight.
- Prototype 2:** Shows a mall floor plan with a red path leading to a store. Text: "Congratulation, you have won a 10% discount for Zara! Scan the QR code below to claim and show at checkout! Please consider blind people when giving them directions." Below is a QR code and text: "Go straight for 200m, turn left and go straight for 300m more. The store is located on the right side."

3rd iteration: Interactive prototype for Shopping Mall Kiosk concept

# APPENDIX

1st iteration: Low-fidelity paper prototype of Visibility Tile Flip concept



DID YOU KNOW?	
About 225 million people are blind or visually impaired, 39 million of them are blind.	80% of people with visual impairment are over 50 years old.
120 million are visually impaired because of uncorrective refractive errors	Retinal diseases are the main cause of visual impairment
1.4 million children are blind.	80% of all visual impairment is avoidable

# APPENDIX

*3rd iteration: High-fidelity interactive prototype of Visibility Tile Flip concept*

