“Iris”

Positioning system

GPS + INS
- Latitude & longitude
- Orientation
- Omnidirectional displacement

Function
- Start & end positions
- Facial orientation
- Real-time calculation of displacement

Air headphones

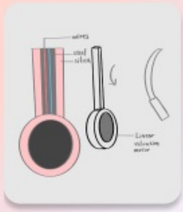
Technology
- Utilizing directional sound field technology

Advantage
- Perceive environmental sounds.
- Minimizes sound leakage

Camera

TOF + Wide-Lens
- Wide-angle
- Depth + RGB + algorithms.

Computer vision
- Road orientation
- Object recognition
- Depth estimation



Damped-support

Hard Stop Pivot
- Fully conform to the face, adapting to different facial data

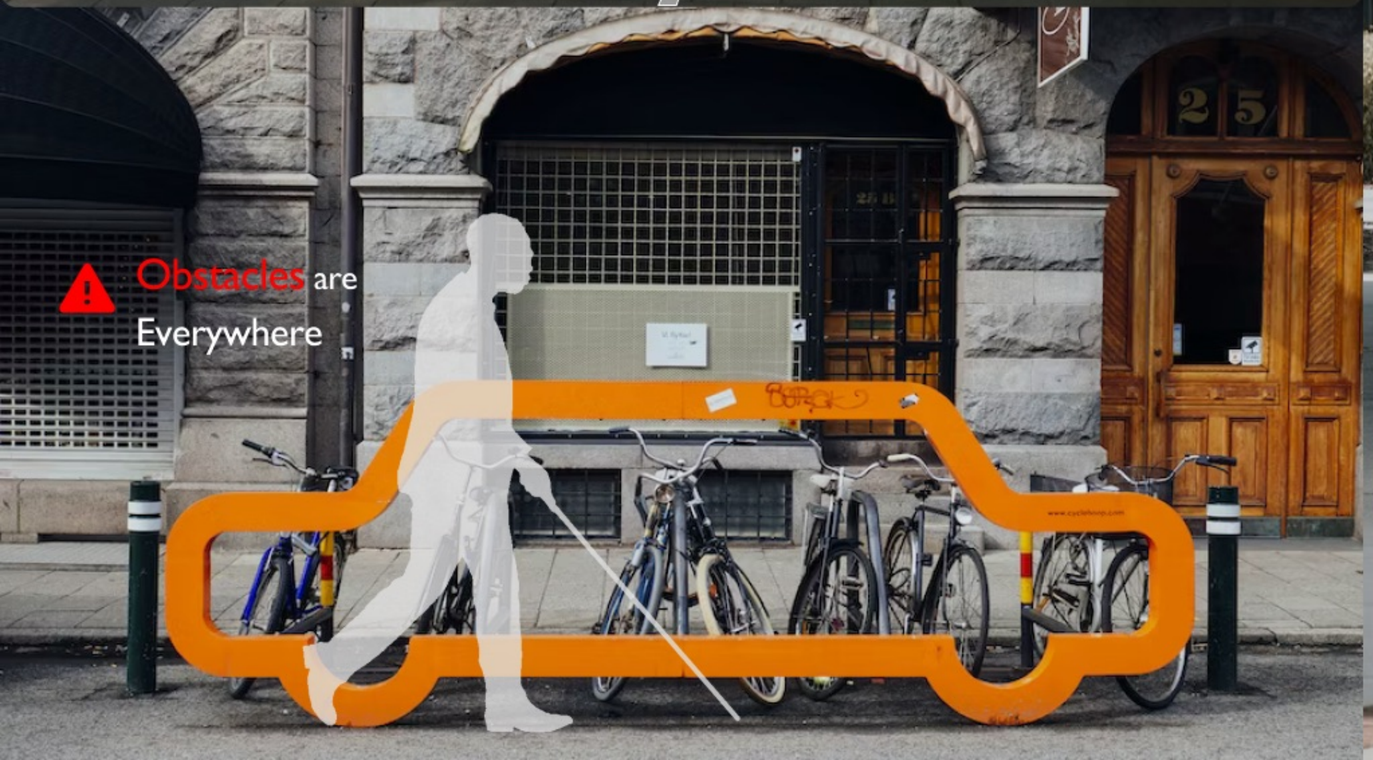
Damping Function
- Vibration isolation with localized damping.

Vibrator

LRA
- Customizable pattern
- Anti-noise capability

Confortable
- Skin sensitivity
- Comfort
- Perceptual accuracy

Wearable Tech for the Visually Impaired



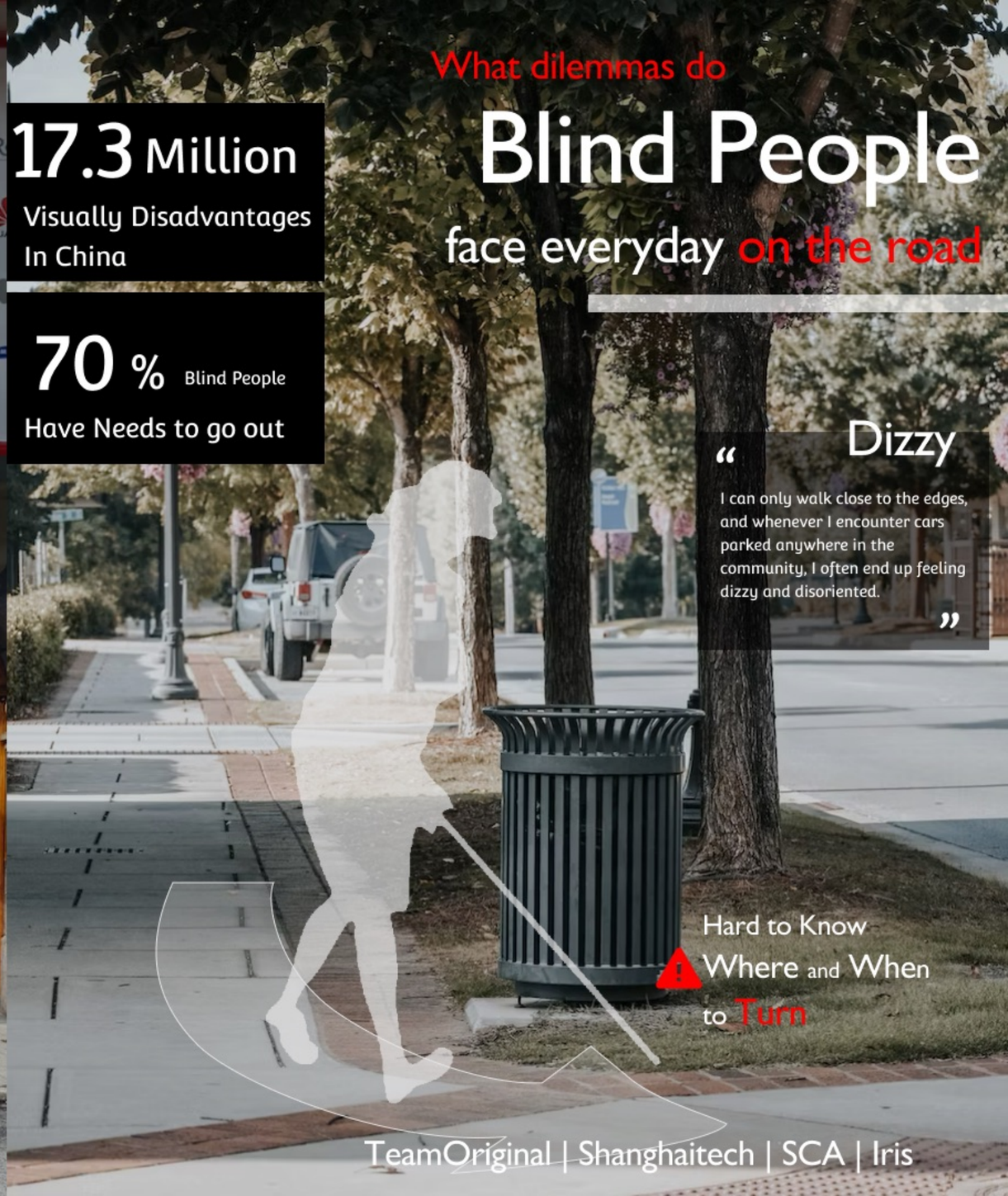
What dilemmas do

Blind People

face everyday on the road

17.3 Million
Visually Disadvantages In China

70 % Blind People
Have Needs to go out

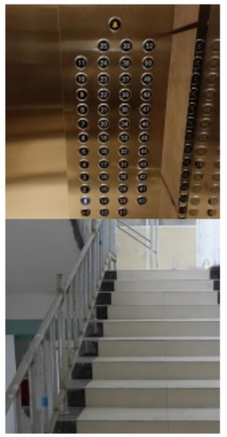


TeamOriginal | Shanghaitech | SCA | Iris

Interview & User Research

Research

User Journey Map

Going downstairs /elevator.	Walking in a straight line.	Obstacle avoidance.	Leaving the entrance gate	From the residential area to the subway entrance.
1.Exploring with cane movement from left to right.	1.Finding a small path in the grassland 2.Searching for the boundaries of the path	1.Navigating around parked cars on the roadside.	1.Standing directly in front of the facial recognition device. 2.Crossing over the gate.	1.Using a mental map to track the number of steps and locate landmarks.
				
1.Navigating with a cane can be challenging.	1.Getting disoriented while navigating around flower beds. 2.Having difficulty finding the boundaries of the road.	1.Getting disoriented while navigating around cars, making it difficult to maintain the correct direction.	1.Finding it difficult to walk diagonally and needing to walk straight before making a turn	1.The road conditions are constantly changing, making it more dangerous.

Scenario & Function

Direction Guidance

Camera Vibrator Magnetometer

Vibration
- Correcting left/right deviation
- Front direction

Voice
No voice feedback.

Obstacle Warning

Camera Vibrator Headphone

Vibration
- Obstacles ahead/left/right
- Directional information

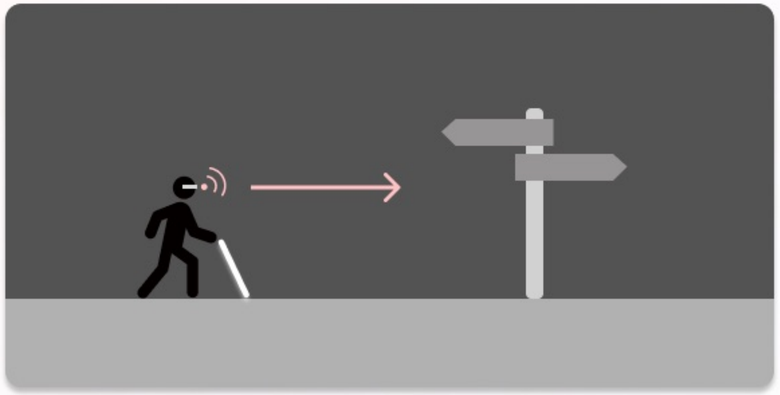
Voice
Audio prompts when trapped by obstacles.

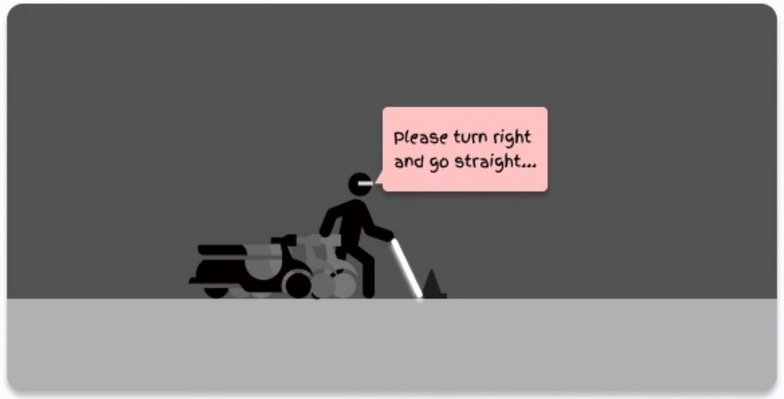
Destination Location

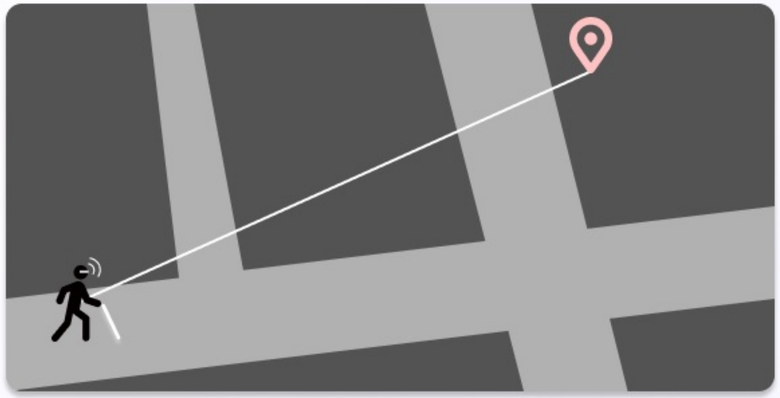
GPS Vibrator Headphone

Vibration
- Triggering at regular intervals.
- Triggering after making a turn.

Voice
Clock-face method indicating direction.





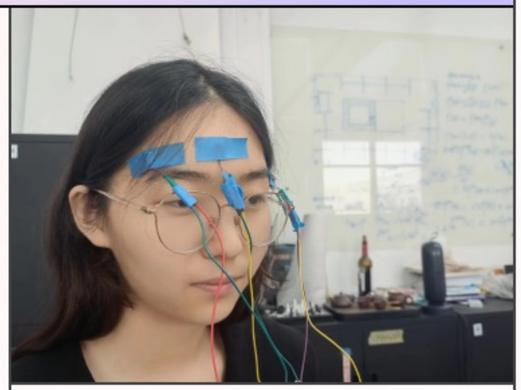


Modeling & Prototyping

Electronic Component Testing

#TEST 1

Through testing, we have found that using **three vibration components** is sufficient to indicate direction.



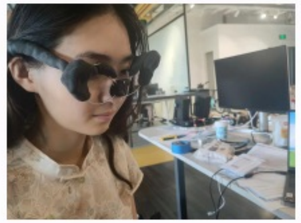
#TEST 2

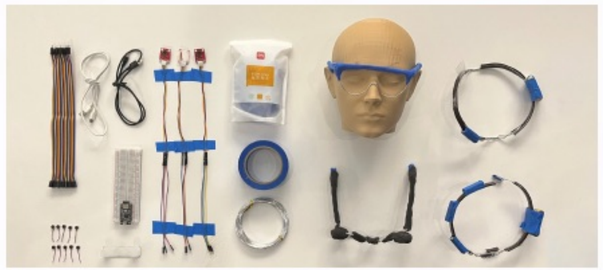
In the second testing, we validated the feasibility of acquiring road data using a camera. In this test, we successfully implemented **road edge detection** functionality.

Rough Form Testing

#TEST 3

In this test, we calculated the total weight of the product and created a clay model of equal mass.
Our model would not slide forward even when the user looked downward.





Walking Testing

Phase 1:
only white cane

Phase 2:
use vibration and white cane

Phase 3:
camera,vibration and white cane