

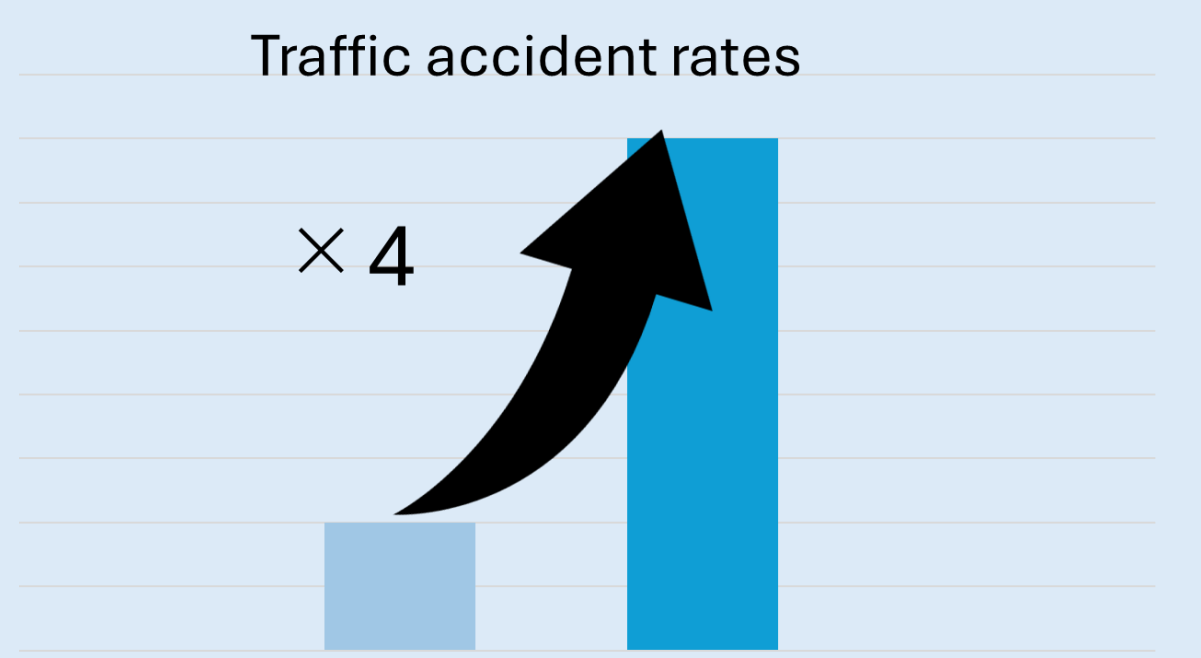
Eagle Eye

A web application to support visually impaired going out safely

Yuzuki Nakanishi¹ and Fuka Sano

Advisor: Teppei Miura¹ and Keiko Eguchi¹
¹National Institute of Technology Toyota College

PROBLEM



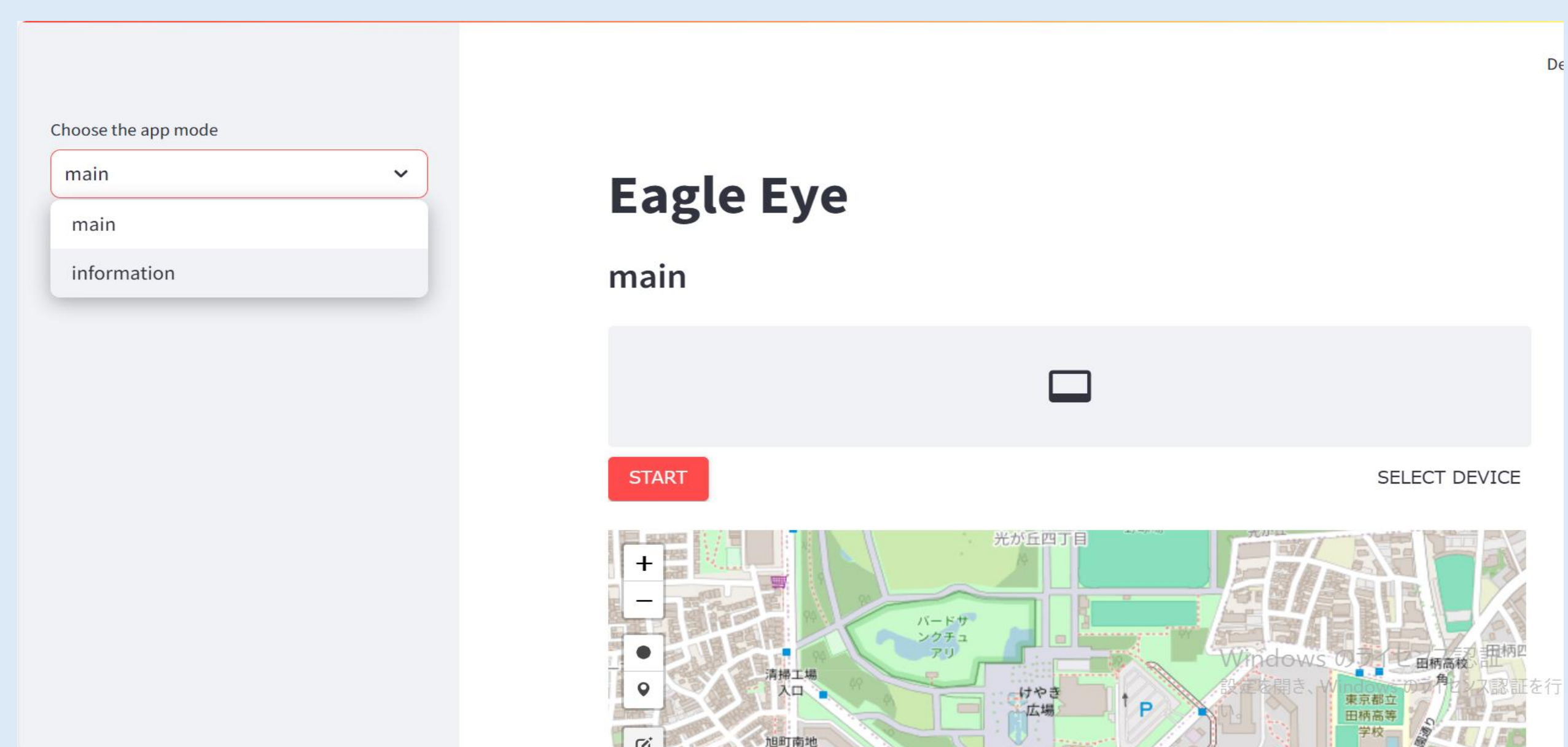
■ sighted individuals ■ visually impaired individuals
 Traffic accident rates for visually impaired individuals are higher than those for sighted individuals.



Facilities for visually impaired individuals in public areas is insufficient

FINDING

GUI Program

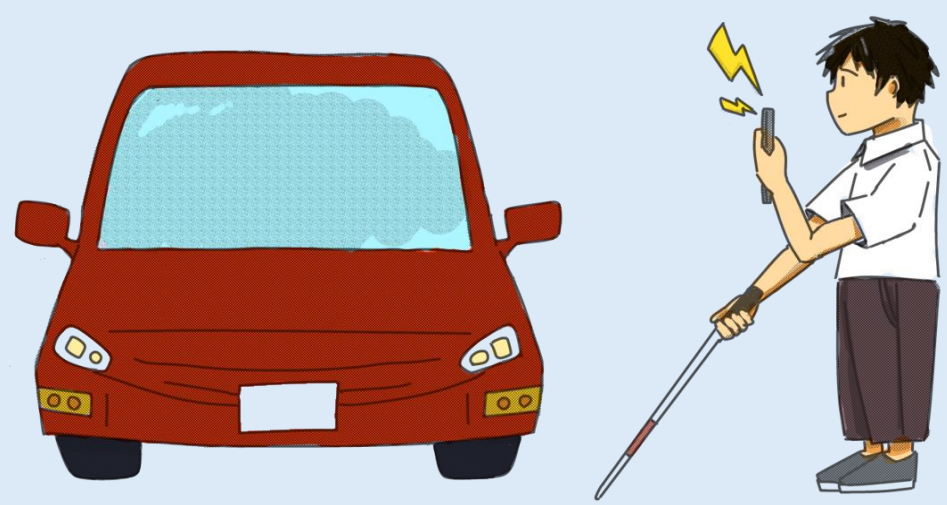


The display page of the program that can be accessed. To launch the app, users need to select 'main'.

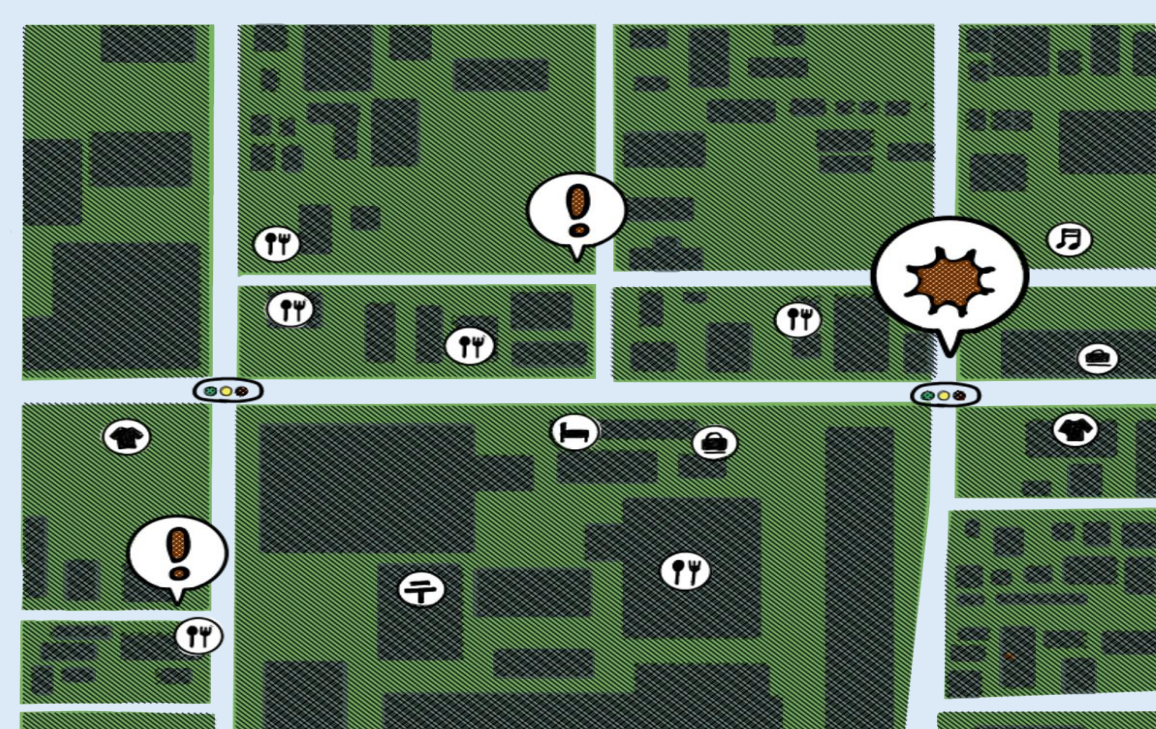
PROJECT DESIGN

Application features

1. Car detection



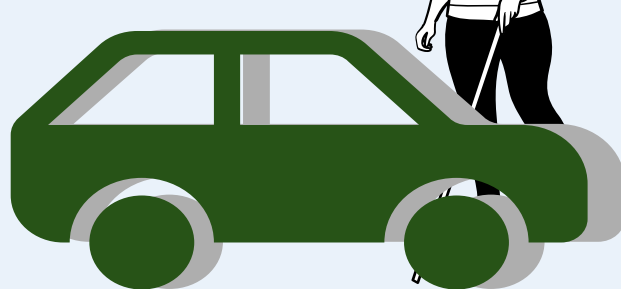
2. Warning map



Flow of features

Car detection

1 The car is in front



2 The camera recognizes the car



3 Alert with sound



Warning map

1 Pins of danger places are on the map



2 Get closer to the pin

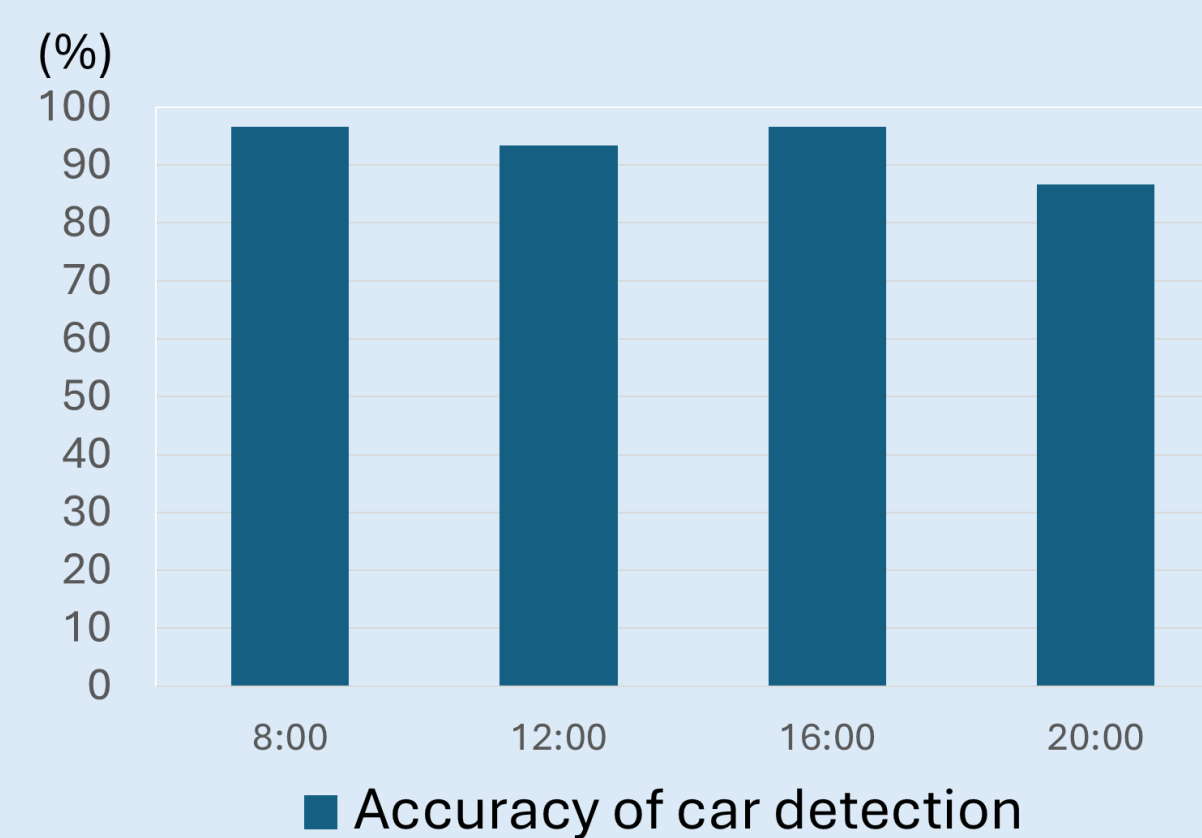


3 Alert with sound



Validating the Application

Accuracy changes with ambient brightness



This test was done for 10 minutes at each time, in a place with a lot of cars. At 8:00 test, the result is 96.6%. At 12:00 test, the result is 93.3%. At 16:00 test, the result is 96.6%. At 20:00 test, the result is 89.7%. The difference in accuracy due to ambient brightness is less than 10% at maximum.

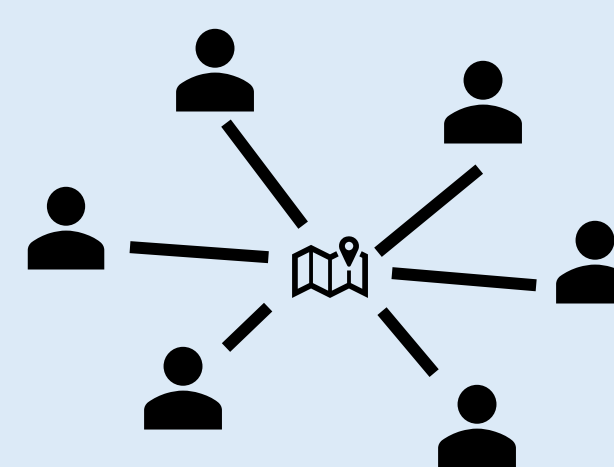


User's pin (Red) Dangerous place' pins (Blue)

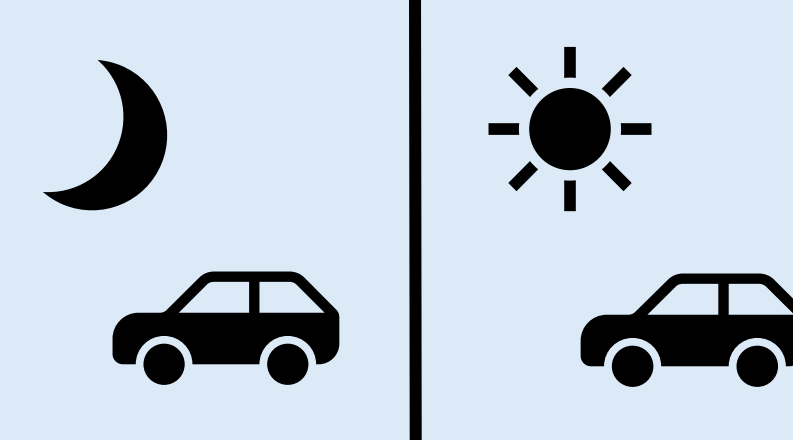
We set up the danger areas as shown in the figure on the left and walked around the place. The verification revealed that simply sounding a warning tone was not enough to provide information on what kind of danger was present.

DISCUSSION

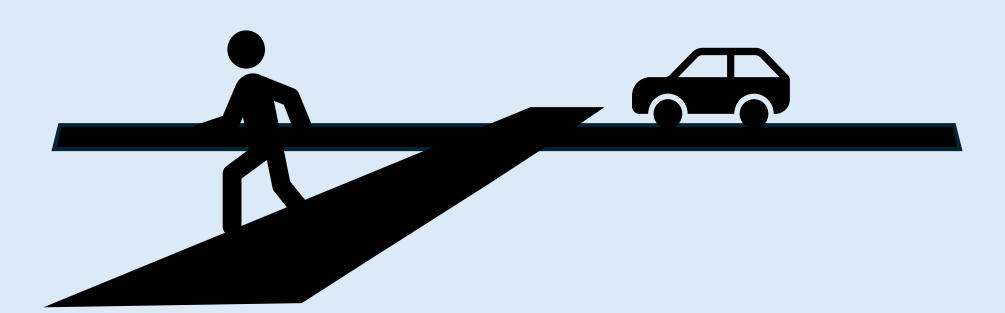
Merit



Users can share dangerous areas with each other. This allows users to be safe even in places they have never visited.



Users can use it even if in the morning or in the evening



The dual use of the two functions allows for safe road selection and safety while walking.

Future task



Although the system has the function of setting dangerous places and sounding warnings, each user has own criteria for judging whether a place is dangerous or not. Therefore, issuing warnings based solely on information about the state of being dangerous may unnecessarily restrict users' behavior and interfere them from going out freely.

Platforms for development



python [1]



[2]



streamlit [3]

REFERENCE

[1]"Python". Python Software Foundation. 2024-9-26. <https://www.python.org/>

[2]"YOLOv8".2024Ultralytics Inc. 2024-9-26. <https://docs.ultralytics.com/ja/models/yolov8/>

[3]"streamlit". Snowflake Inc. 2024-9-26. <https://streamlit.io/>