Surveying App

USER GUIDE
FINAL VERSION

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13 January 2021

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Introduction and Purpose

The aim of the "Surveying app" is to establish the exact size of properties and compare them against the deed to a property. so that it can be used to determine where to set fences so that the fences sit on the boundaries between properties. the app that could let users walk along the boundaries of a property or area and then display to them the perimeter and area of that property as well as give them an estimate of how much fencing would be required to border the area.

App Features

*it could be briefly summarized as **9 features:***

feature 1: Region class

- *allow the user to record several different regions and calculate some information for these.*
- *all of them will be distinguish*
- *Region class will have several private attributes: an array of corner locations, the date (and time) the region was saved, and any other necessary information and methods.*

feature 2: RegionList class

- *RegionList class has several private attributes: an array of instances of the Region class, a count of the number of regions in the region list, and methods to add, get or remove regions from the region list as well as getting the number of regions in the list.*

feature 3: Go to the location

- *On the Record Region page, it will display a map by using the MapBox API*
- *allow the user to click on the map to register their current location on the Record Region page*
- *after the user has picked a location, it will be allowed to repeatedly "add a corner" for the perimeter of an area.*
- *These corners will become a new Region*
- *the user will be able to see the updated region polygon displayed on the map*

● *there is a method to reset the Region if they make a mistake.*

feature 4: Persistent storage of Region instances

● *The Record Region page lets the user have the ability to save the new region once they have finished recording the corners.*
● *the data will store the region in the current instance of the RegionList class and store this in local storage and return the user to the Region List (index) page.*
● *The above function will not run until the user adds at least 3 corners.*

feature 5: Showing a list of Regions

● *Once the user saves one or more Region instances in local storage, it will modify the Region List (index) page so that it will display a list of Regions that can be viewed.*
● *include the date/time when the region was recorded.*
● *the app will navigate to the View Region page and show that Region once an entry in the list is clicked.*

feature 6: Viewing a Region

● *the app displays the region on an interactive map via the View Region page when the user wants to view an existing region,*
● *the user can remove that Region, this means it will remove the Region from local storage and then the relevant RegionList instance before returning the user to the Region List (index) page.*

feature 7: Region area and perimeter

● *calculate and return the area and perimeter of the region.*
● *Update the View Region page to display this information.*

feature 8: Calculating fencing required

● *create a fence for the area, fence posts should be spaced at most every 4 meters, equally along each side of the boundary polygon with a fence post at each corner. assume that three posts split the side into four equal spans and so are positioned 25%, 50%, and 75% of the way along the side.*
● *return the fence data to the View Region page, when the user toggling on the display of fence posts on the map*

feature 9: Settings Page

● *allow the user to customize the maximum distance between fence posts, It is also possible to revert this setting to its default value.*

Instructions for Use

Step 1

This is the beginning of the interface, with a list of regions displayed, with a "+" symbol in the upper right corner, click to enter the map interface.
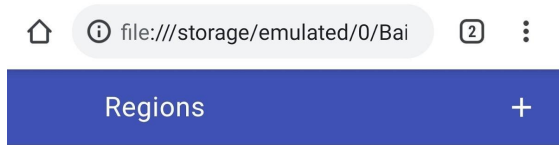

Figure 1

Step 2

After entering the map interface, there are the following buttons: Add Corner is to put down the corner at the current position, as shown in the figure, the blue origin will refresh every five seconds, you can put down the corner according to your real-time position. Of course, you can also click anywhere on the map to drop the Corner. After putting down more than two corners, you can click Show Path and Show Polygon to display the route between each corner and the polygon surrounded by the corner. You can also click SAVE to save the corner at this time. If the corner is placed incorrectly, you can click Reset to reset.
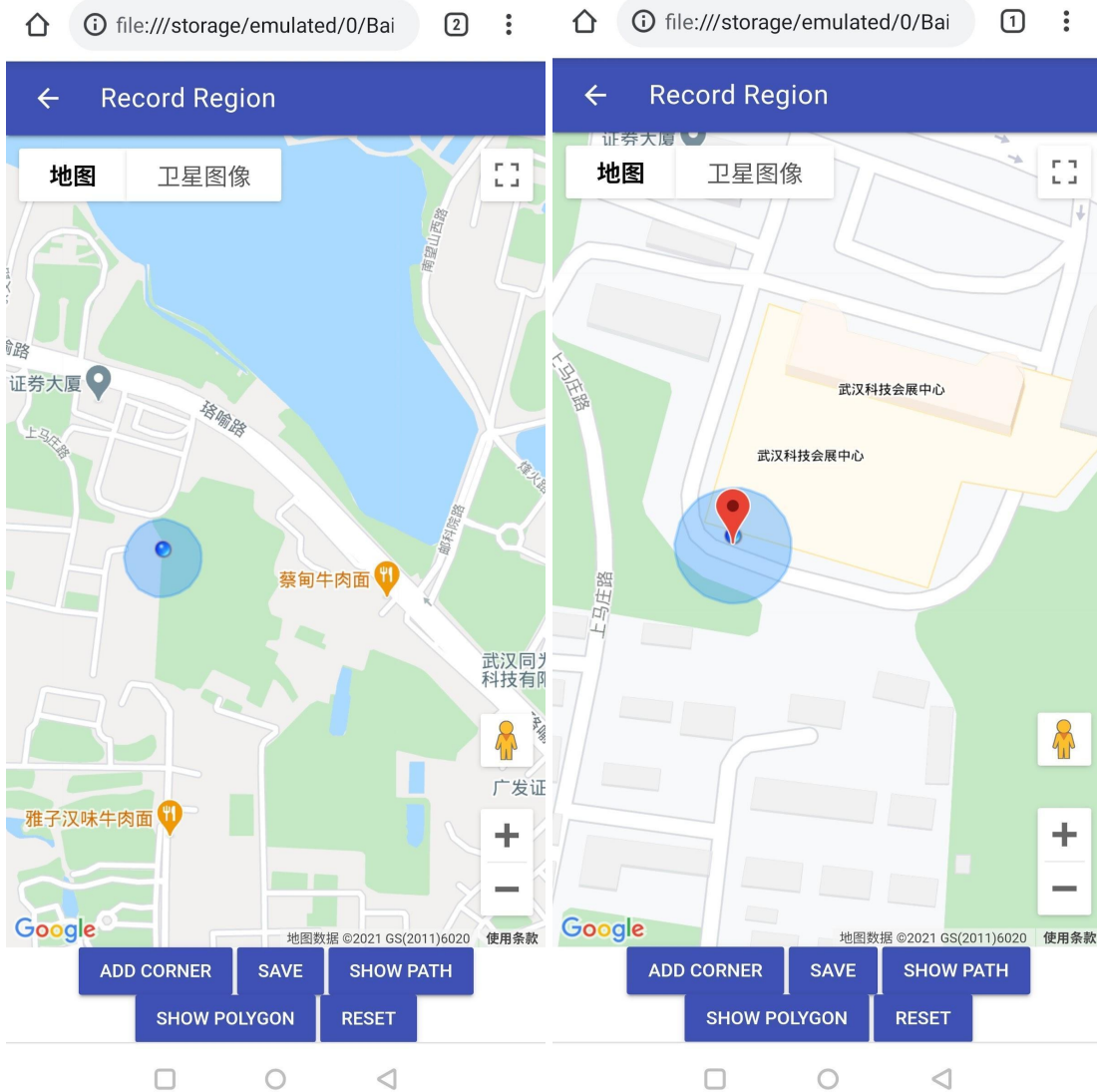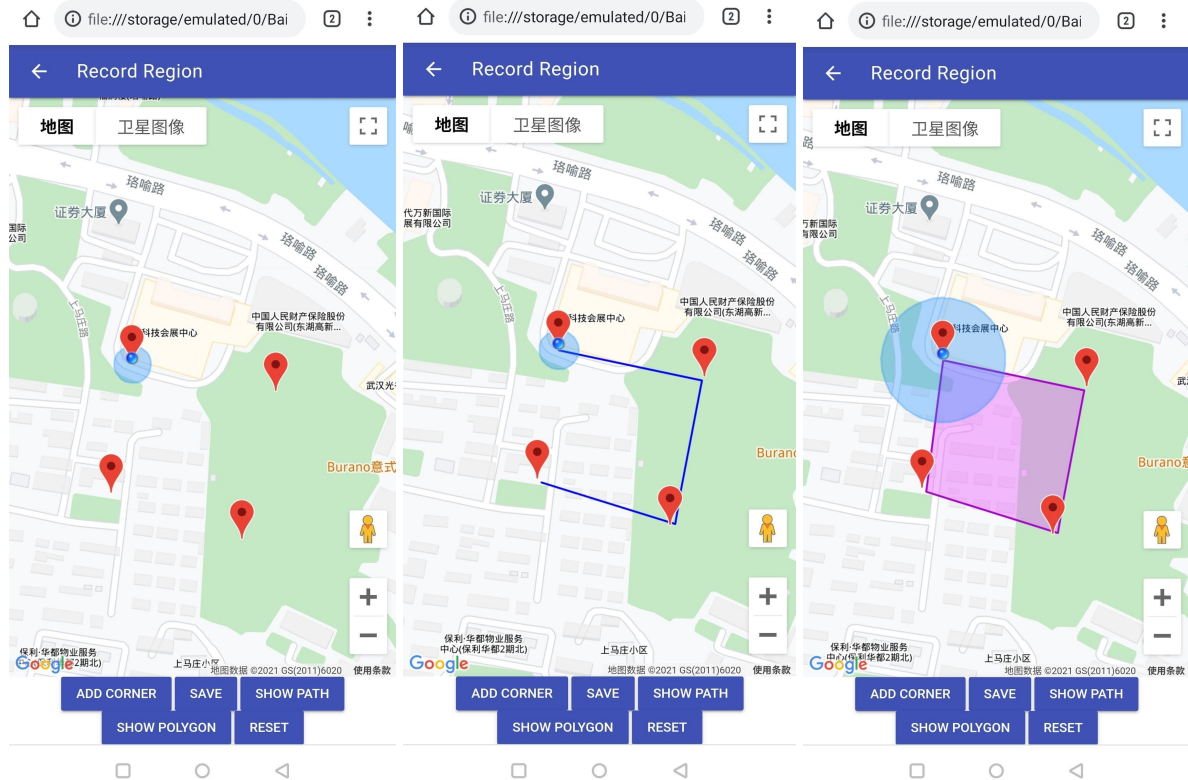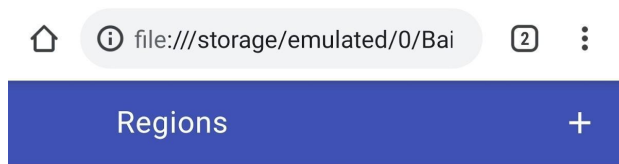

Figure 2   *Figure 3*

Figure 4 - 6

Step 3

After clicking Save, you can return to the initial interface, and you will see the record you saved (Region1). Click on Region 1 to enter the toggle mode.

Figure 7

Step 4

After entering the Toggle mode, you can see two buttons. The setting is to enter the settings to set the distance between every two fences. Toggle can show/hide all fences. At the same time, the side length, area, and a number of fences are displayed directly below the interface.

Figure 8

Step 5

In the setting interface, you can enter the distance between every two fences in the input box, and click OK to confirm. If you make a mistake, you can click Reset to reset the value. Once confirmed, click the return button in the upper left corner to return to the previous interface.
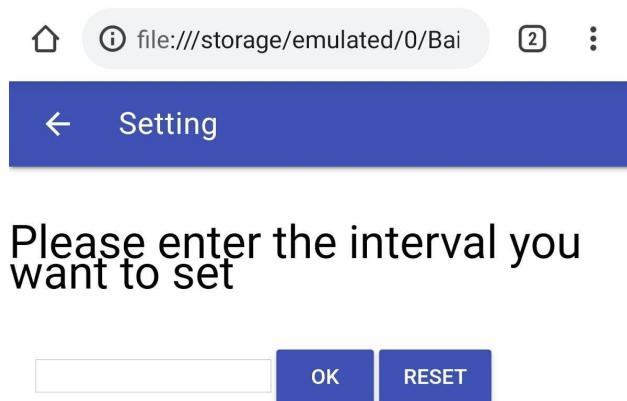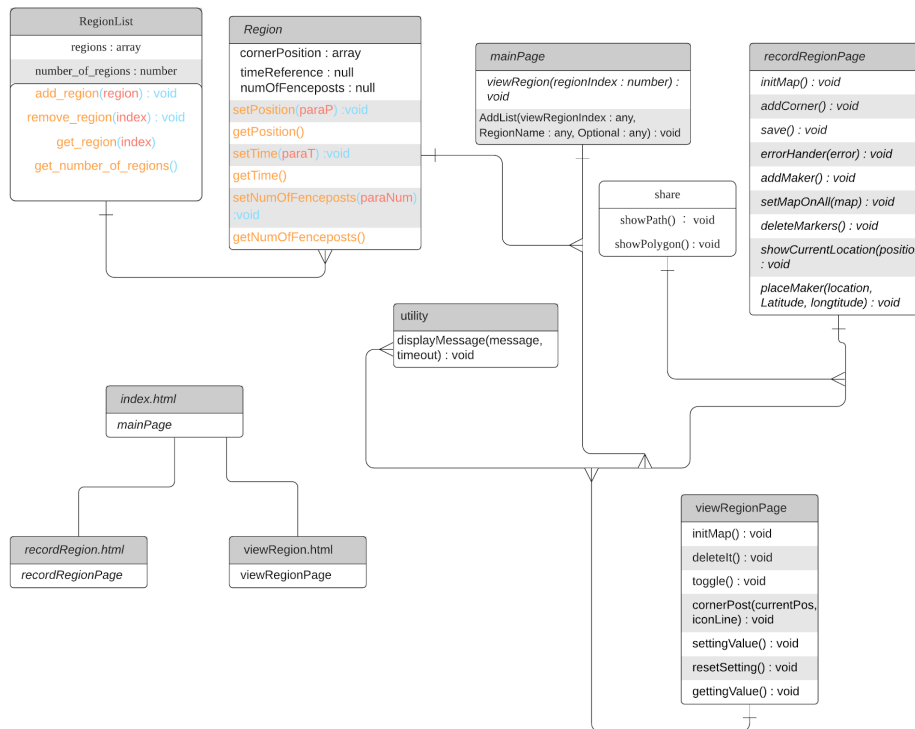
Figure 9

Step 6

After setting, click Toggle to show/hide all fences. On the map interface, whenever you want to delete this Region, click the "Trash Can" in the upper right corner to completely delete the Region at this time.

Figure 10

Class Diagram

Class Diagram clearly shows the relationship diagram between each section and class of my program design. The recordRegionPage and viewRegionPage can be accessed from the main page, and there are also some other functions that intersect them.

Known Bugs or Limitations

App limitations:

1. My UI needs to be more beautiful. Due to time constraints, I need to improve the aesthetics of the design UI.

2. Due to technical limitations, I hope to have dynamic effects between each of my interfaces, so that the user experience will be better.

3. Due to technical limitations, the button effect can become better. If the feeling of pressing each button can be improved, the user experience will be better.

4. When the real-time position accuracy is too low, the corner cannot be clicked to place the corner within the blue range.

There are some bugs found in the App:

1. In Toggle mode, if the fence spacing is not set, the number of fences below will change to "Infinity" after clicking Toggle.

2. When the map is zoomed to a very small time (that is, the distance between each corner is very far), each corner placed is saved in "show path" and "show polygon", and when entering the viewRegionPage, path and polygon can be seen.