

REPORT 3

PATH



PATH

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Part One

Idea of the Project

1. Requirement analysis

1) Eliciting requirements:

YU YENCHIA, Zhao Yun, Zhao Binqi, three Grade 2 students from TJU in Jiading. They all like skateboarding but in Jiading it's hard to find a good path to skateboard. Once they found a good path, they have to lead others to their next time otherwise nobody else will know that place. They know that there are lots of students in the campus skateboard, but they don't know where exactly those students skateboard. So, they are thinking to create a APP which can bring everyone loves the same sport together and share information to each other.

2) Analyzing requirements:

Problem:

"have to lead others to that place next time otherwise nobody else will know that place"

Why:

They are willing to share their experience to others

They don't have something that can record a track and lead others through it.

Problem:

"hard to find a good path to skateboard" & "don't know where exactly those students skateboard"

Why:

People with same hobby in the same place are not being connected

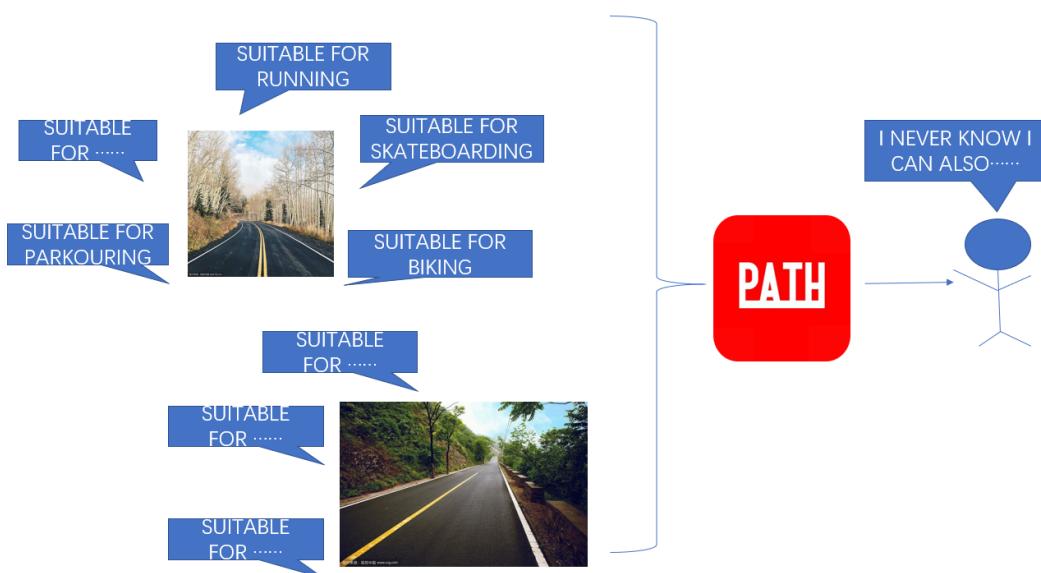
People are always trapped in thinking set, it's hard to find another function of the same place by ourselves.

3) Major ideas:

According to the analysis, we want to create an app in which the users can record a single path they have walked, skateboarded or parkoured by redefining the roads' name and function as they like and sharing it to anyone who is using PATH. On the other hand, users can find those paths which have been redefined and go through it for themselves. When they are on

this “redefined” path, they can see the spots the definer tagged and share their feelings after and while finishing this journey.

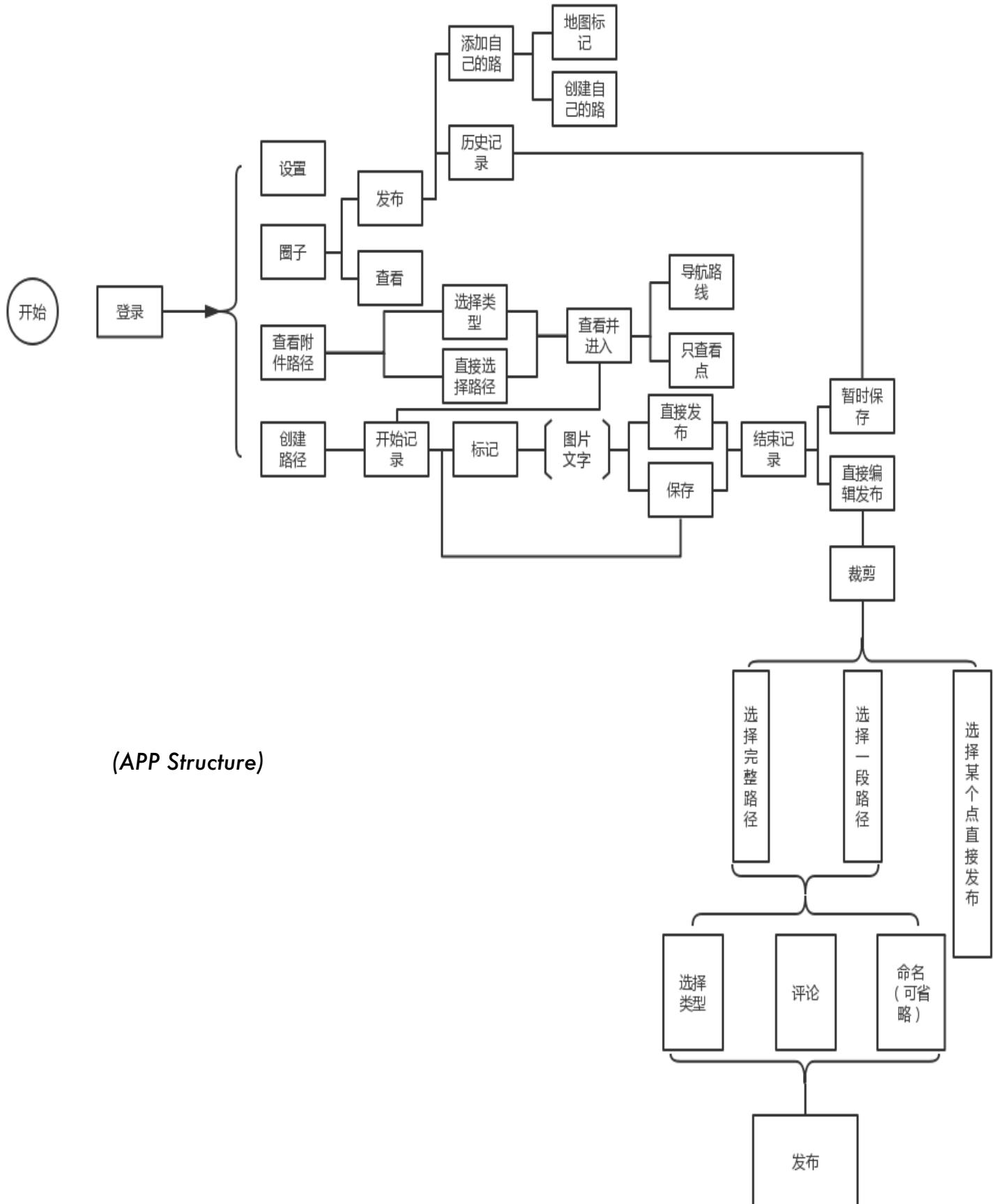
Our target users are young people, tourists, or someone love outdoor sports. What we want to do is making going outdoor more intriguing and offer people a brand-new perspective to look at the city.



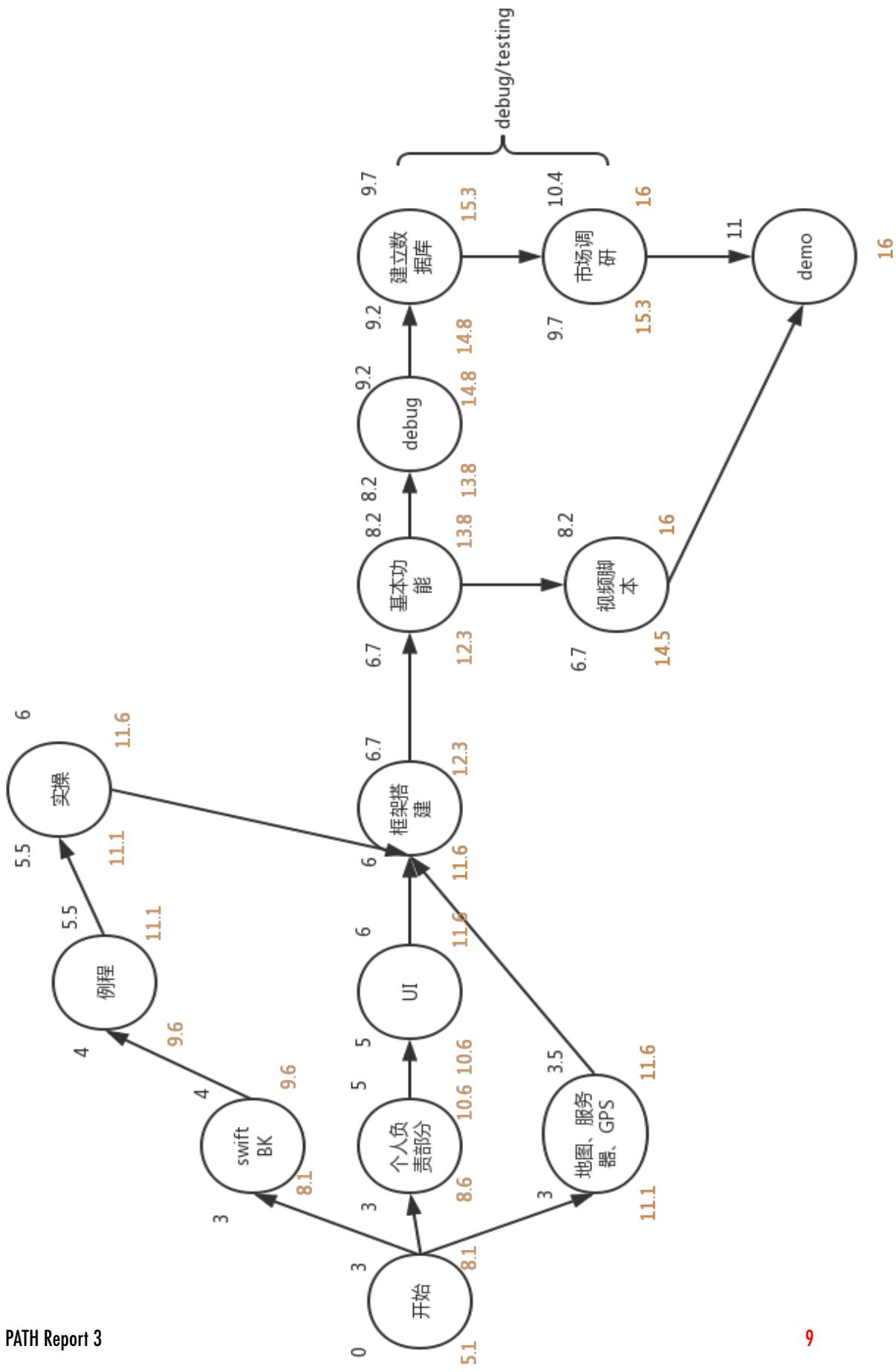
2. Deliverables:

Our major deliverable is an iOS app. To log in this app, you can use a PATH account, WeChat, QQ account or your phone number. After logging in, you have 4 options: "setting", "select a path", "create a path" and "moments". In the "setting section", you change some basic setting up including account, sound, display, etc. "Select a path" section is the background of main

interface. You can see all the “redefined” path around you and select one to follow the track and make some comments to the creator. In the “create a path” section you can record your track and “redefine” its name, function, add some interesting spots on it and share it to everyone using PATH. “Moments” is an additional function and it will not appear in the demo. The main idea of “moments” is that people can share their instant moment like Weibo or Facebook.



3. Planning



Our project is divided into four parts, of which are as follow, earlier stage knowledge acquirement, the formation of logic of the app, launching of the beta version and the last part, market investigation and the making of the demo.

Why do we divide our work in such a way? Obviously, the learning part is a must, and when we gain enough perceptual understanding of the making of an app, we can move on to the next part, which is the formation of the skeleton of the app, aka, its logic frame, this step is consistent with the prior step, without which it can't be realized. The next is the construction of the beta version of the app, of which it'll need mass programming, at the meantime, we shall establish the database, we estimate this process will be faced with a great deal of debugging, thus we allocate five weeks of time for this process.

The first part is earlier stage knowledge acquirement, of which acquiring relevant knowledge, we divide this into two parts according to our teammates. The common part is about language Swift, platform iOS and programming software Xcode, we allocate about three weeks for this part, meanwhile, we shall each learn about our parts, including the construction the servers, GPS and location, the realization of the map and the design of UI/UX.

The study of concrete examples offered online (one and half weeks), aka, finding and studying the realization of the apps that are map-based and are on iOS platform. We expect our team members to read the most basic iOS software and know their algorithms.

The actual programming (half a week), requires a summarizing of all the knowledge we gathered from earlier.

The second part is the construction of the logic frame of the app (one week), in which phase we shall understand the app more deeply.

The third part is the beta version of our app (four weeks), which includes the confirmation of the functions (a week and a half), debugging (a week), the construction of the database, and through this process, we shall continuously be debugging. As the pouring in of our users, we expect more and more bugs.

The fourth part is the market investigation and the making of the demo (two weeks). Collecting the materials our demo needs, making the questionnaire and analyzing the mass data.

Throughout the management, we apply activity-on-node method, and in general the whole process will take approximately thirteen weeks.

4. Project Schedule

Earlier Stage Knowledge Acquirement Mar.13-Apr.13	acquiring relevant knowledge The study of concrete examples The actual programming
--	--



Construction of the Logic Frame of the App Apr.13-Apr.24	understand the app more deeply
---	--------------------------------



Launching Beta Version of the App Apr.24-May.22	confirmation of the functions debugging the construction of the database
--	--



Market Investigation and the Making of the Demo May.22-June.6	collecting the materials making the questionnaire analyzing the mass data
--	---

5. Logo & UI Design



Launching PATH, where you will find more interesting things and get to know more interesting souls... In PATH, we let you have a taste of something different in the bland life by allowing the users give new names and classify the roads based on interest, and furthermore, experience the new fun of each different road, fall in love with a new world full of fun and challenges!

Logo design concept: The logo body is composed of red and white. The red and white colors represent the vitality of life. In the report of the 19th National Congress, President Xi Jinping pointed out: "The major contradictions in our society have been transformed into a conflict between the people's ever-growing needs for a better life and unbalanced development." This is one of the inspirations of our app development. With the ever-increasing need for a better life, we must also follow the times

and create an app that encourages everyone to go out and discover and experience the better life. The theme of the logo is the name of the app. The last one of the four letters of the app is a symbol of our joint efforts. The members of the group have a single heart and can be seen as a path, which corresponds to the original connotation of the path.

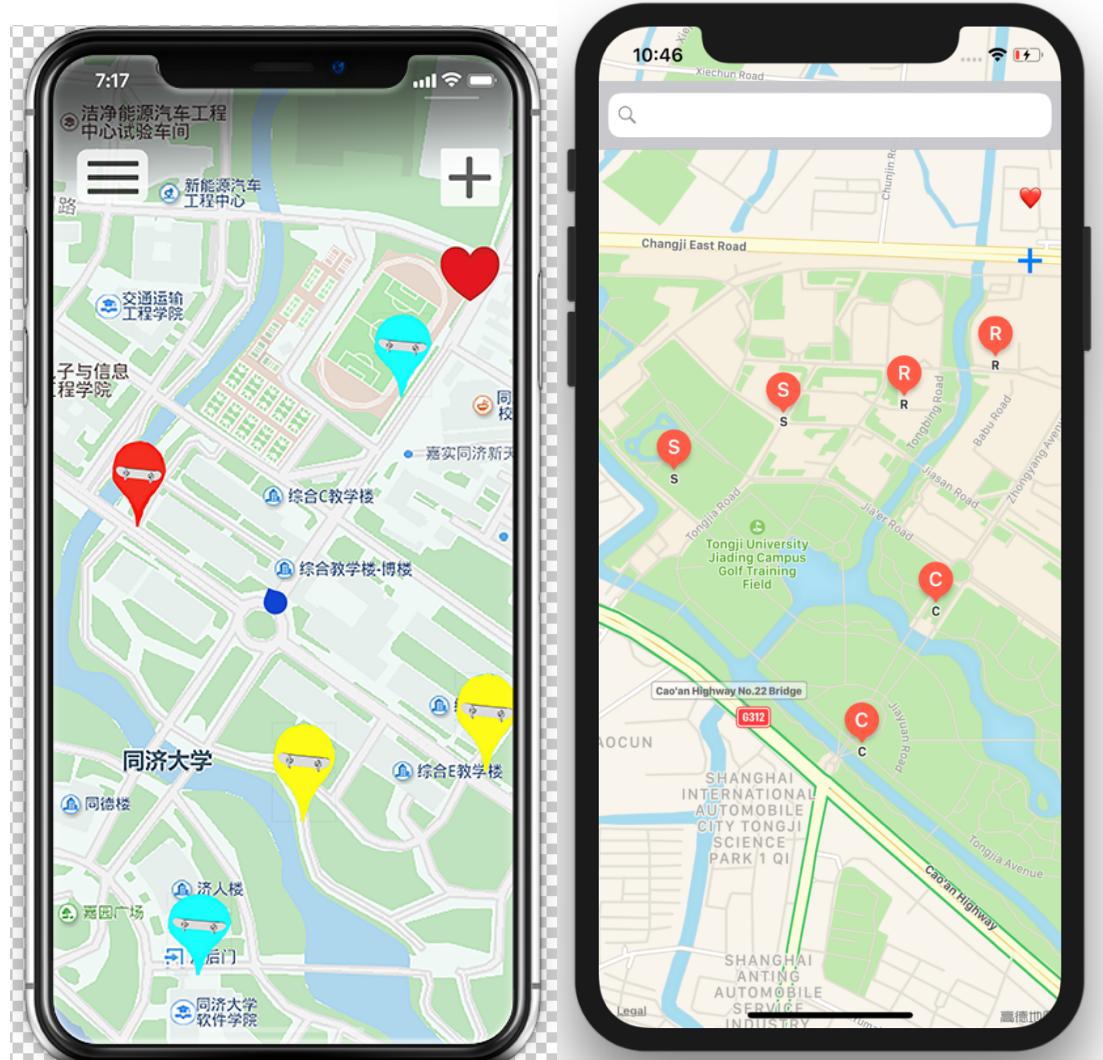
1) log in page :



PATH basically consist of red, black and white three colors. The page on the left is the preview we designed at the beginning. The page on the right is the interface that will be displayed to the user (the following interface is the same). As you can see, compared with what we initially thought, we finally decided to use a simpler white background. The final interface is simpler and clearer, giving users a better visual experience. At first, we wanted users can log in with normal PATH account as well as QQ, WeChat or Weibo account, which is convenient for everyone to use. However, due to time

reasons, we did not find the appropriate WeChat and QQ excuse, so we failed to achieve this function.

2) Main interface :



When the user clicks log in, they will see the main interface.

When we were designing the main interface, we have considered whether we should use spots or lines to represent these "redefined"

paths. And last, we decided to use spots since they can help users find those interesting paths close to them more clearly and will not make the screen a mess.

And the rectangle on the left-hand side with several lines in it is the setting button. “+” is a button to create a new path. And the red heart is to select your interested kind of paths. There will be more specific description in the passage below.

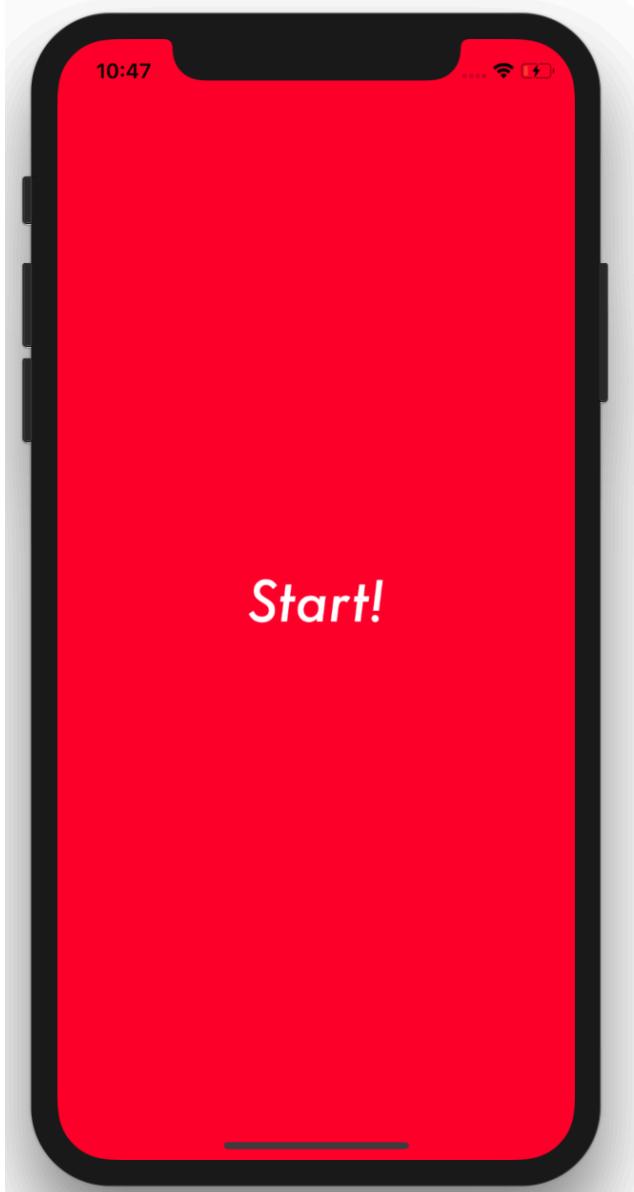
In the design of the main interface, we made adjustments to colors, icon sizes, and shapes. Compared with the initial design interface, the actual interface is more beautiful, and the user will find the function he wants to use more easily when he uses it.

3) Create a path



In the main interface there is a button with "+" on the right hand side. Press this button you will enter the page besides, it is "create" page.

Compared to the initial design, before the creation of the interface, we designed a "start" interface with a red background, which makes it easier for users to understand the purpose of the creation interface. At first, we design this page can obtain your location with the GPS sensor inside you phone and mark one the

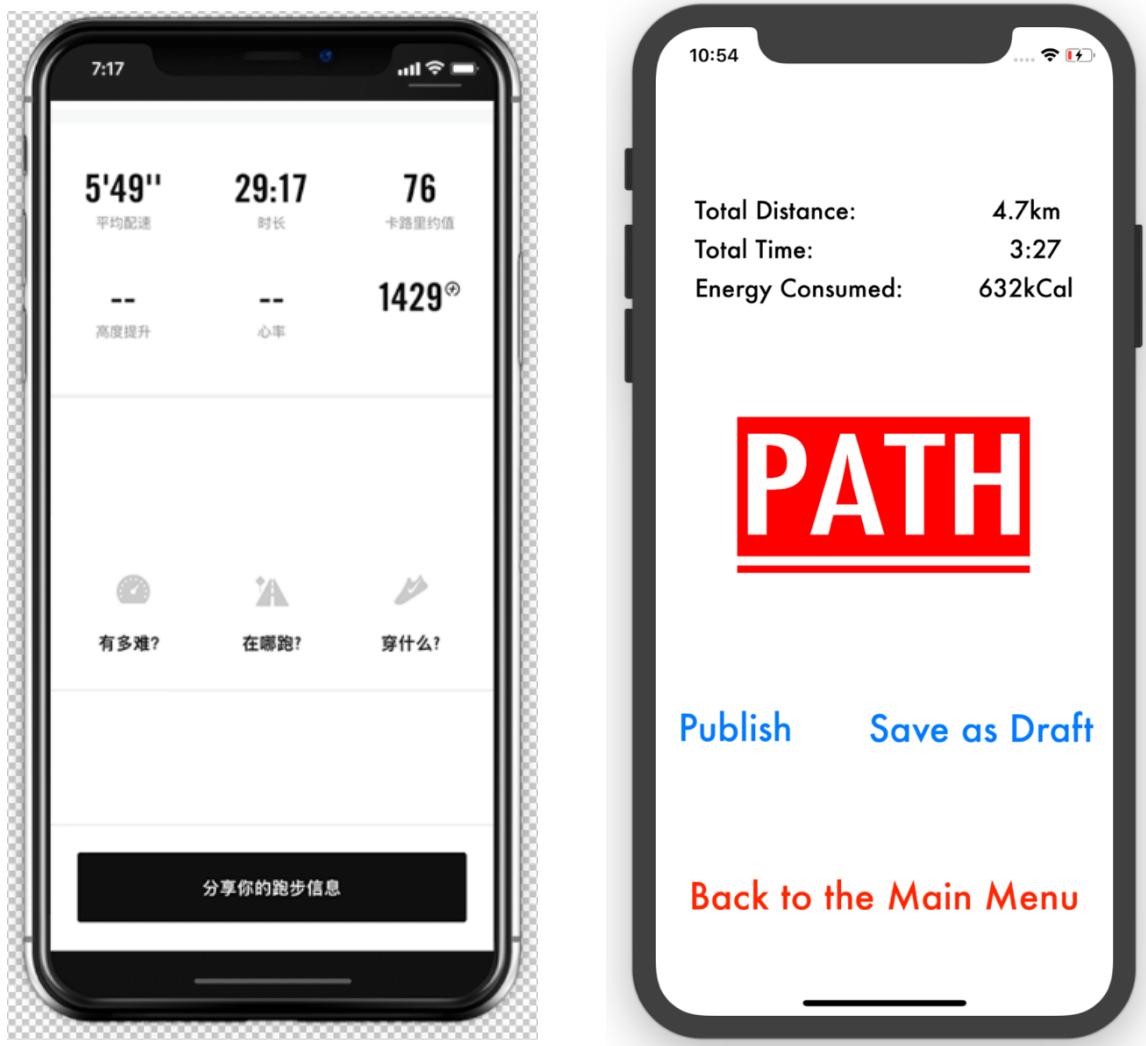


map, which is also the background of this page. At the bottom of this page there are three buttons, which are "end", "start/pause" and "tagged".

However, at present, we have only completed the positioning to the current position. Because there are some bugs, the user's path cannot be directly displayed in the interface, but is recorded

in the contents of the database. Compared to the initial design, the current interface can display the user's specific location coordinates, but cannot accurately record the complete route

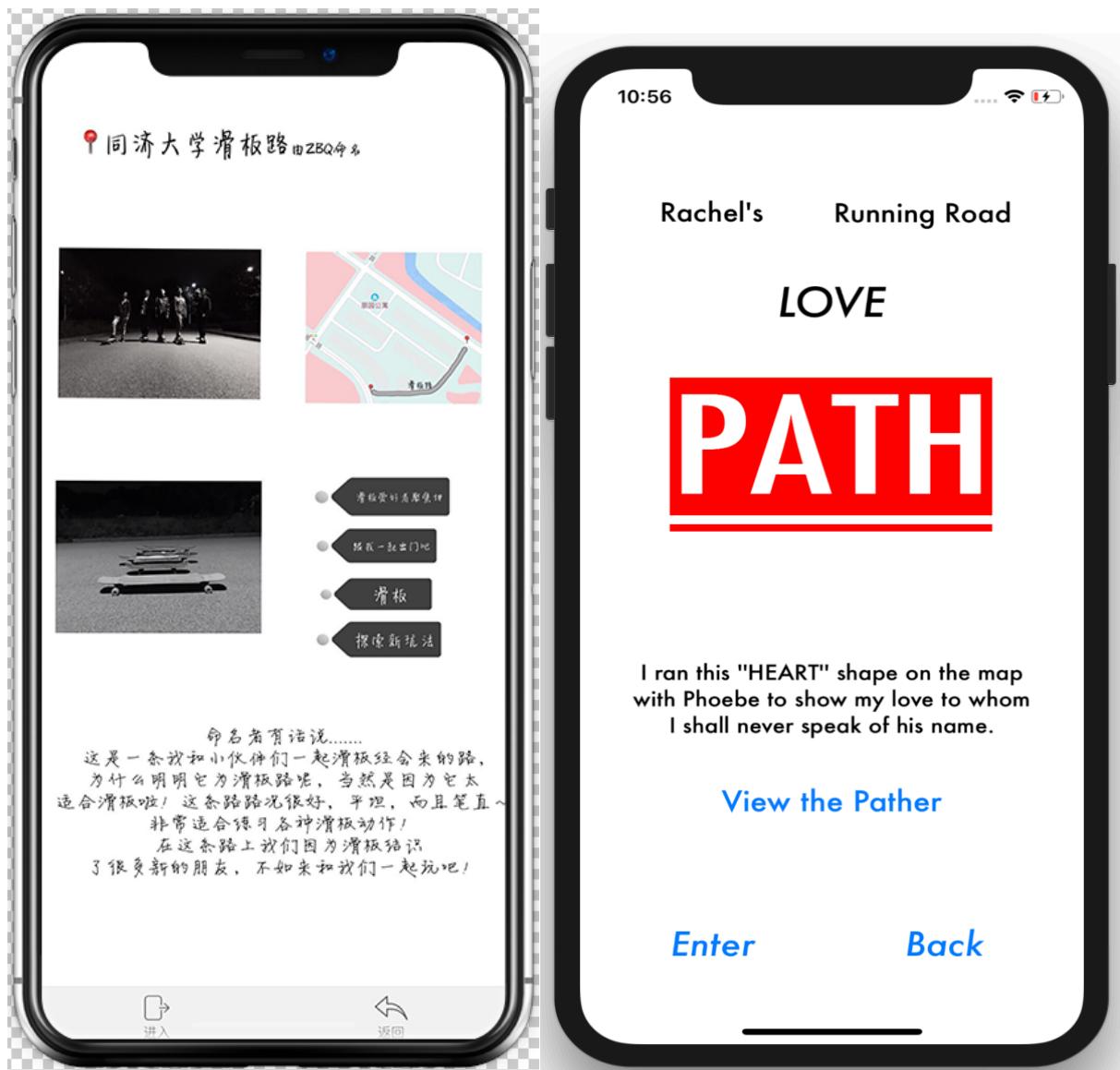
4) Publishing page



In this page, user can see some data about their trip, including time, distance, photos, written words and etc. User can also edit the name, the function of this path and add some interesting things here. After finishing editing, user can publish this path.

We have modified the content layout of the publishing interface

in the final version, which is simpler and straightforward.



5) Go Through a Path



When user press a spot on the map of main interface, a new page pop-up. In this page, it shows what the creator recorded, including the brief information of the creator, basic information of the path, pictures of this path and etc. Base on the words and pictures, user can have a brief idea of this path and decide whether to go through it or not.

Compared with the initial design, the current interface information

is more complete, and the user can better understand the specific information of the creator of the path and path before starting the path.

6) Analysis Interface



When the user clicks the "End" button, the user will enter the next analysis interface. After entering, the system will compare and analyze the data according to the original definer's route and the user's actual route. The analysis results include: matching degree, total distance, time spent, energy consumption, etc. The user can intuitively see the data in the experience process, through the data, users can learn more about this experience.

In order to be consistent with other interface styles, we modify the background color of this interface to be white.

In the final version, we also added a new feature. When the user clicks the chat, the user can interact with the creator of the road, and the user can get more contact with other people, more interesting things and more friend.

7) Preferences



After clicking "End", the user will return to the main interface and click the ❤ button to open the preference interface.

In the preference interface, the user can choose the type of road that he likes according to his needs. For example, Jack is a skateboarding enthusiast. In this interface, Jack can select the option of skateboarding, after he clicks the back button, on Jack's

map only the routes of the skateboard will be displayed. The existence of this interface provides convenience for the users to find preferred routes. Through the setting of the preference interface, the user can find the route that suits himself/herself faster and more accurately.

Return button: When the user clicks "Back", it returns to the main interface.

This interface is now more beautiful!

PART2

Object Oriented Design

1. Use case design

- Use case Analysis

Table 1

ACTOR	GOAL	USE CASE NAME
Creator & User	Log in app	Log in(UC-1)
Creator	Create a path	Create(UC-2)
Creator	Publish the path	Publish(UC-3)
User	Select one path and start trip	Select(UC-4)
User	End trip and see result and make comment	End trip(UC-5)

Table 2

REQ1	Show log in page
REQ2	Show map
REQ3	Jump page when press specific button
REQ4	Show specific functional button
REQ5	Display a pop-up window
REQ6	Record track
REQ7	Trace existing path
REQ8	Add new path to map

Table 3

Req't	UC1	UC2	UC3	UC4	UC5
REQ1	X				
REQ2		X		X	
REQ3	X	X	X	X	X
REQ4	X	X	X	X	X
REQ5	X			X	
REQ6		X		X	
REQ7					X
REQ8			X		

Use Case UC-1: Log in

Related Requirements:	REQ1, REQ3, REQ4, and REQ5 stated in Table 2
Initiating Actor:	Any of PATH user
Actor's Goal:	To log in the app.
Participating Actors:	Account input box, log in button, WeChat, QQ & Weibo log in button
Preconditions:	<ul style="list-style-type: none">The set of valid account stored in the system database is non-emptyLog in button has been press
Postconditions:	Account and password are correct.
Flow of Events for Main Success Scenario:	
→ 1.	Users (a)enter account and password (b)press WeChat, QQ or Weibo log in button, then pop-up a window and enter their account and password
2.	Press log in button
← 3.	System verify account and password, if correct jump to the main page, else stay in log in page

Use Case UC-2 Create a path

Related Requirements:	REQ12, REQ3, REQ4, and REQ6 stated in Table 2
Initiating Actor:	Path creator
Actor's Goal:	Create a new path
Participating Actors:	Map, pause button, end button flag button, edit page
Preconditions:	<ul style="list-style-type: none">have GPS signal and internet connection
Postconditions:	User press start record button
Flow of Events for Main Success Scenario:	
→ 1.	Users press “+” button in the main page
← 2.	Jump into “create” page
→ 3.	Press the “start” button
← 4.	System start to record the track you have been through

- | | | |
|---|----|--|
| → | 5 | Press the "tagged" button, |
| ← | 6 | Pop-up window appear, user can write down their feelings or upload photos of this position |
| → | 7 | User press the "start/pause" button |
| ← | 8 | System start/pause recording the track |
| → | 9 | User press "end" button |
| ← | 10 | Path record stop, a pop-window appear. And there are two button: "save" and "publish" |
| → | 11 | User press (a) save (b) publish |
| ← | 12 | (a) return to the main interface (b) jump into publishing page |

Use Case UC-3: Publish

Related Requirements: REQ3, REQ4, and REQ8 stated in Table 2

Initiating Actor: Path creator

Actor's Goal: To publish the recorded path

Participating Actors: Path name, path function and feeling input box, publish and save button

Preconditions: • A path was recorded but has not been published yet

Postconditions: The "publish" button was pressed

Flow of Events for Main Success Scenario:

- | | | |
|---|----|---|
| → | 1. | Users edit the name, the function of this path and add some interesting things in this page |
| | 2. | User press (a) "publish" button (b) "save" button |
| ← | 3. | (a) System upload this path and show this path on the map (b) save this path to the history |

Use Case UC-4: Select

Related Requirements: REQ2, REQ3, REQ4, REQ5, REQ5and REQ7 stated in Table 2

Initiating Actor: User (using the defined path)

Actor's Goal: Go through the defined path and experience what the creator did

Participating Actors: Path name, path function and feeling input box, publish and save button

Preconditions: • user select a path

Postconditions:

Flow of Events for Main Success Scenario:

- 1. User press on a path spot on the main interface
- 2. Pop-up the introduction of the path, and there are two button on the screen, "enter" and "leave"
- ← 3. User press the (a) leave button (b) enter button
- ← 4 (a) return to the main interface (b) enter the map of the path
 - After entering the map, system begin navigate automatically. When arriving a spot the creator tagged, system sent message to the user and pop-up the recorded information.
- 6 User press the "end" button
- ← 7 Trip over, jump into analysis interface

Use Case UC-5: End trip

Related Requirements: REQ3 and REQ4 stated in Table 2

Initiating Actor: User (using the defined path)

Actor's Goal: Read his/her analysis and comment on the creator

Participating Actors: Info and comment section

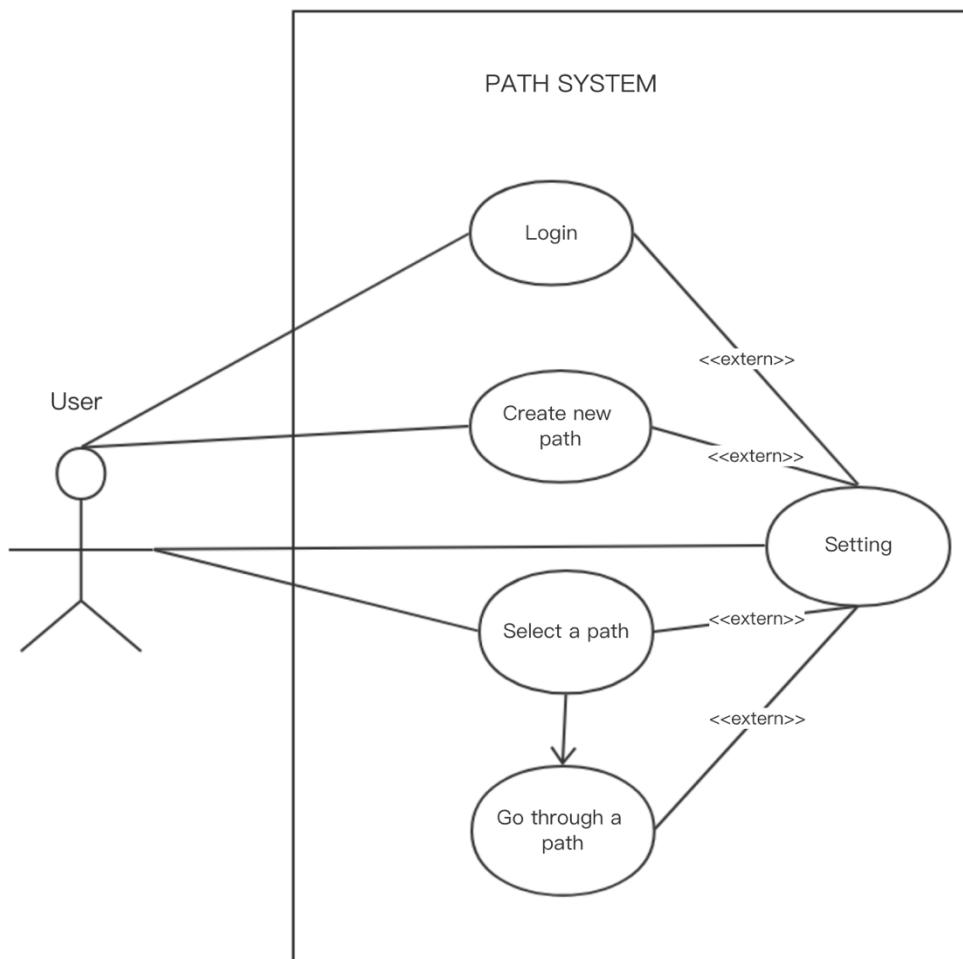
Preconditions: The user has introduced of route follow

Postconditions:

Flow of Events for Main Success Scenario:

- 2. Pops out the info of this journey, like matching degree, comment section and buttons, etc.
- ← 3. (a) input comment and hit send (b) hit back button
- ← 4 (a) publish a comment and return to the main user interface (b) back to the main user interface

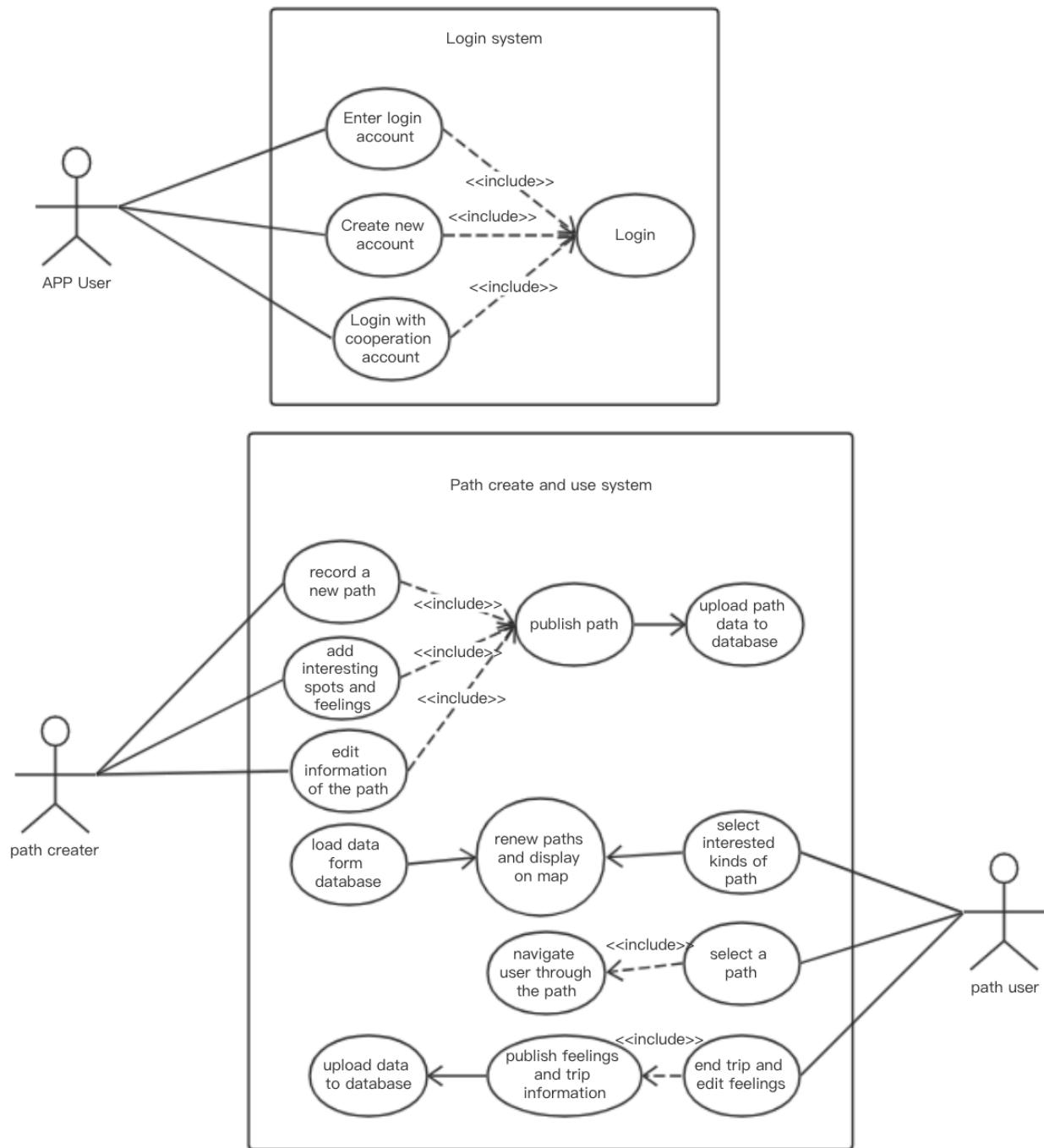
● Use Case Diagram



A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.

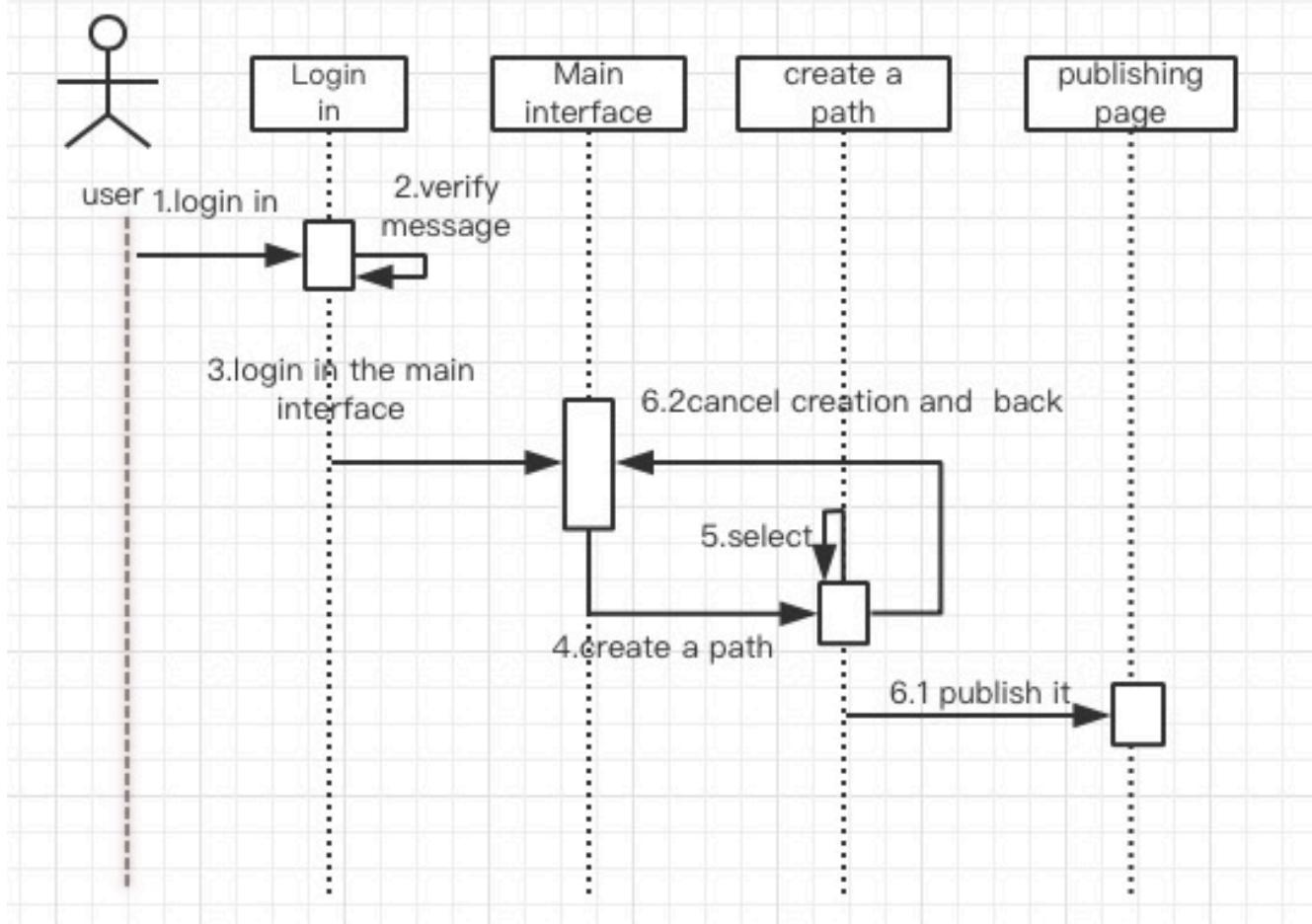
A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well.

● Use-Case Diagram (Full-Bodied)



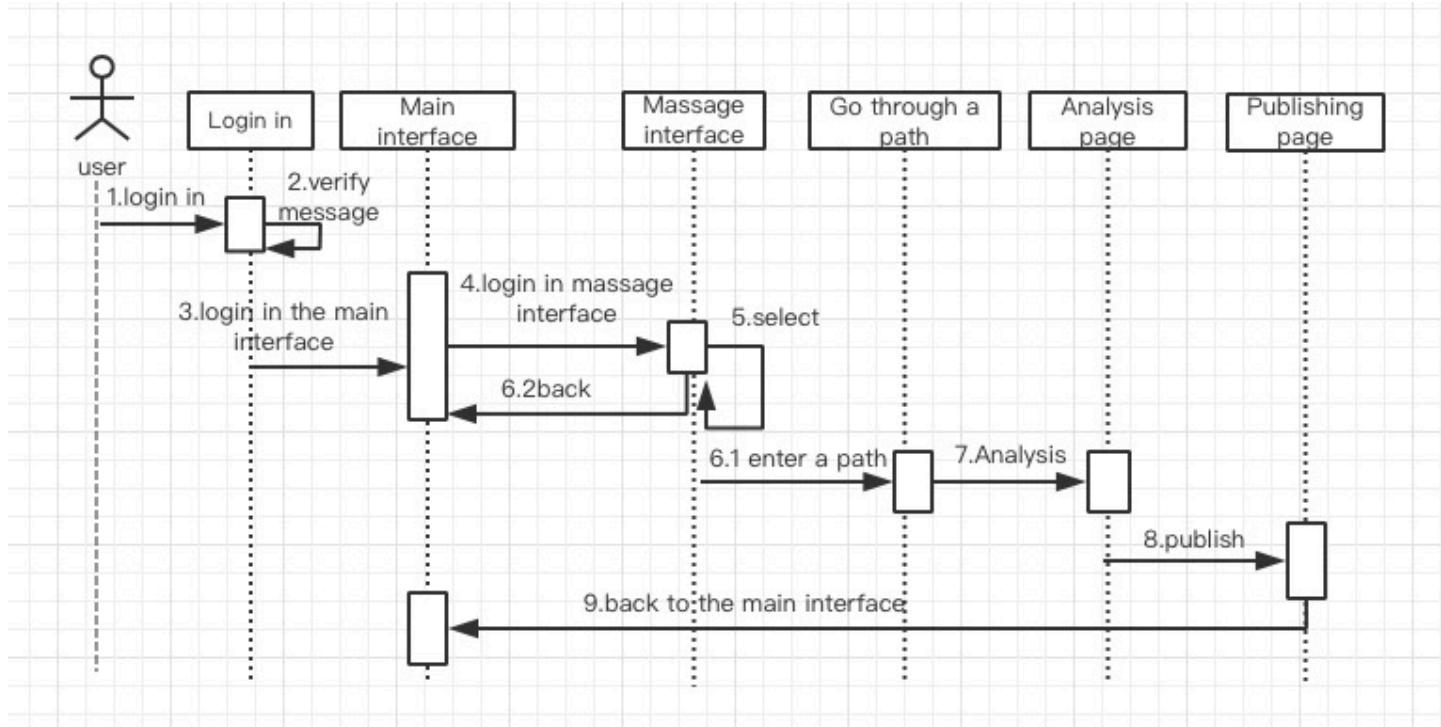
2. System Sequence Diagram

- Creating a Path



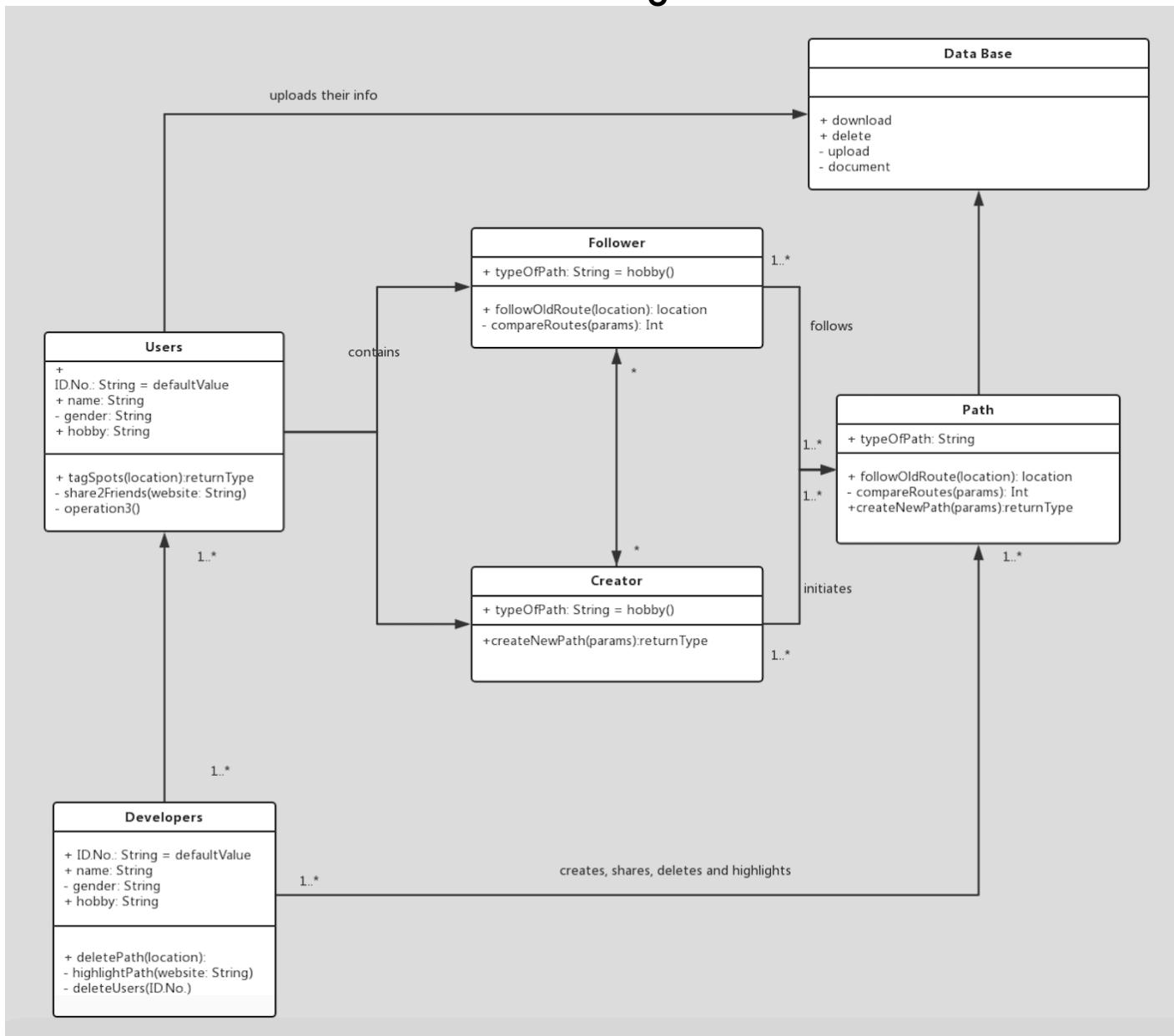
The sequence system describes the temporal order in which messages are sent between objects to show dynamic collaboration among multiple objects. It can represent the sequence of the use case behavior. When executing a use case behavior, each of these messages corresponds to a trigger event that causes a conversion in a class operation or state machine.

- Following a Path



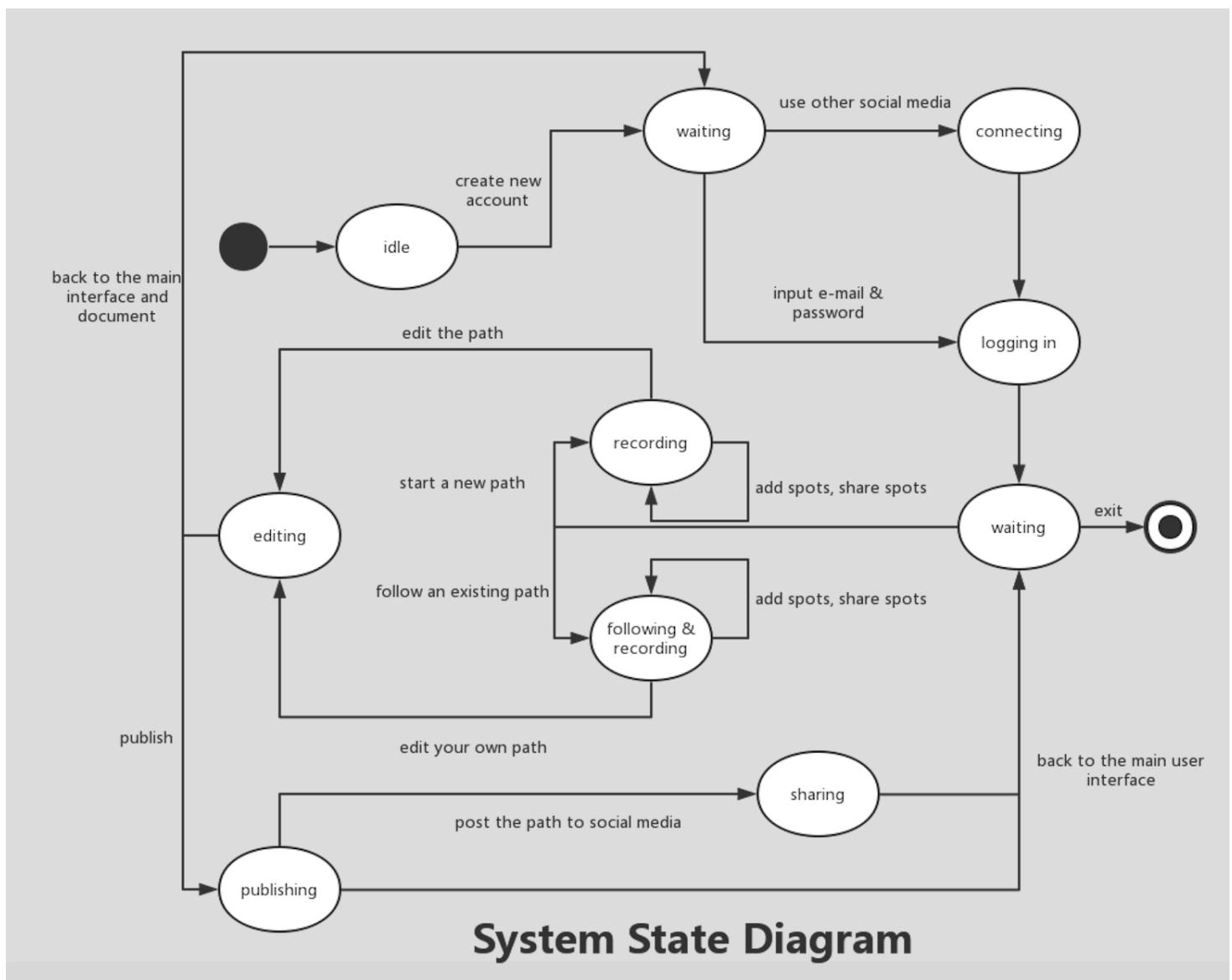
In our sequence diagram, we can see two different events that the user performed through the operation. One of them is: enter system-entry path-join path-analysis path, and the other is: enter system-create path-publish path.

3. Class Diagram



We think that the main classes can be divided into these parts, users, developers, paths and outer data base/cloud servers. And the users are composed of two parts, which are the followers and the creators. This diagram clearly shows the relationship between the six components interacting with each other.

4. State Diagram



When a user is first introduced to this app, the first thing to do is to either create a new account or log in to an existing account, after this step, the user is in the main user's interface, in which he can then choose to do the following, record a new route of his own or follow an existing route but at the same time, record his own. During this process, the user, whether be the definer or the

follower, can stop the recording at any given second and post and share his/her immediate emotion or tag a place that is very interesting or simply take a photo and then upload them to the route.

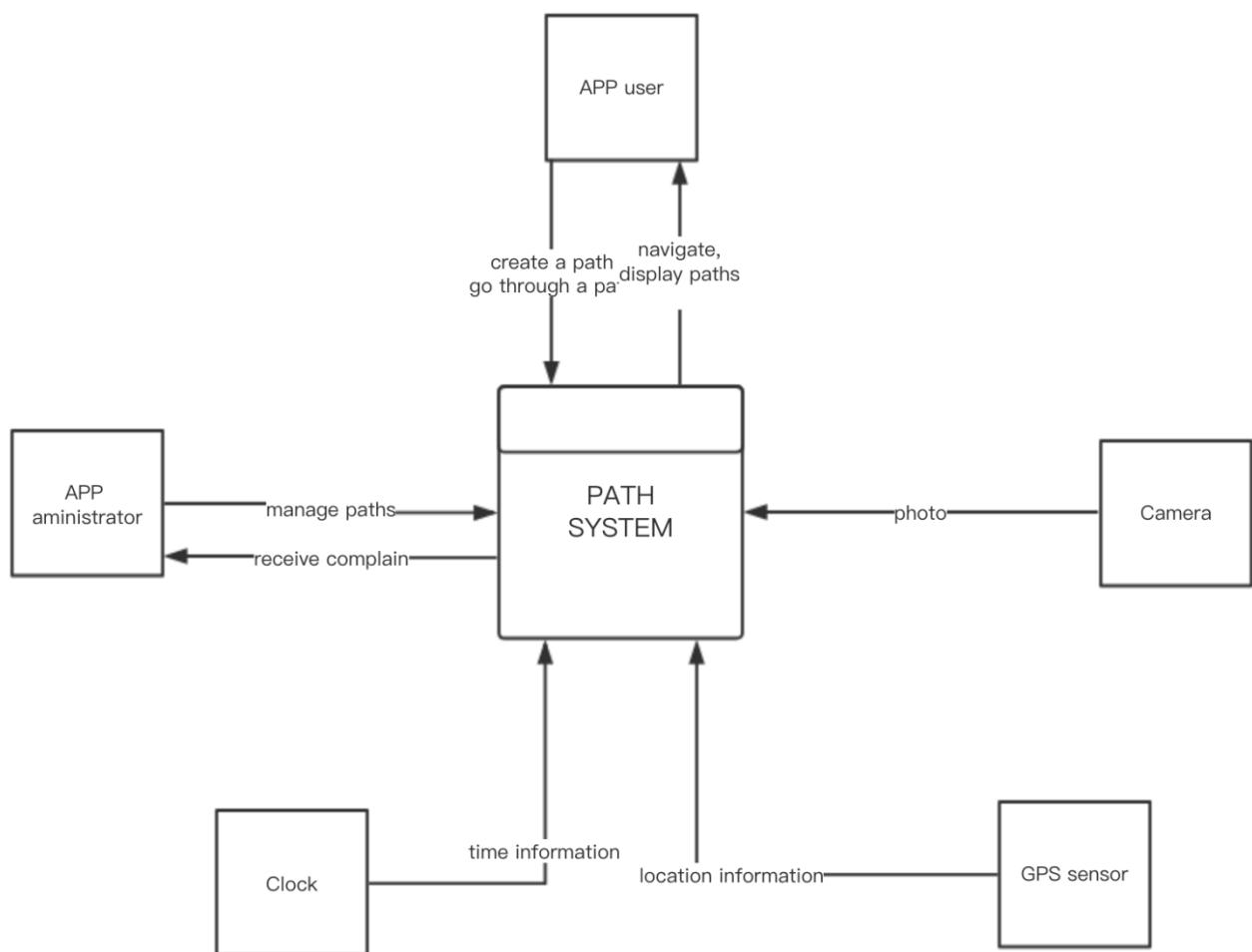
After finishing a route, one can easily edit the path and choose to either publish this path at the very instant or choose to save on the local drive.

When publishing, the user may also share the route to any other social media he/she likes, say, WeChat moments, Facebook or any other network.

PART3

Logical Design

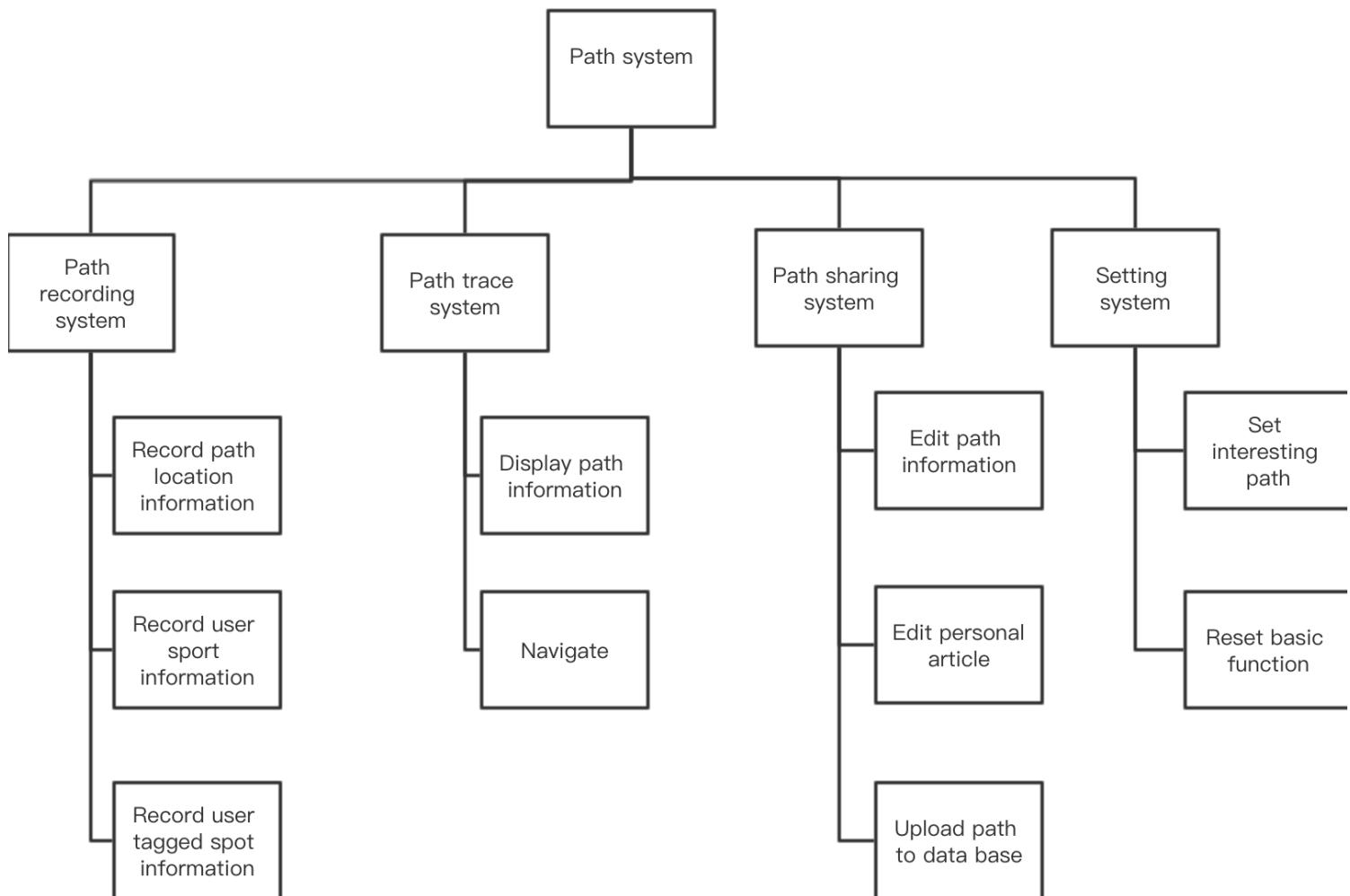
1. System Context Data Flow Diagram (Abstract)



A system context diagram in engineering is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram

is a high-level view of a system. It is similar to a block diagram. In this figure, we can see the relationship between entities and interactions.

2. Functional Decomposition Diagram

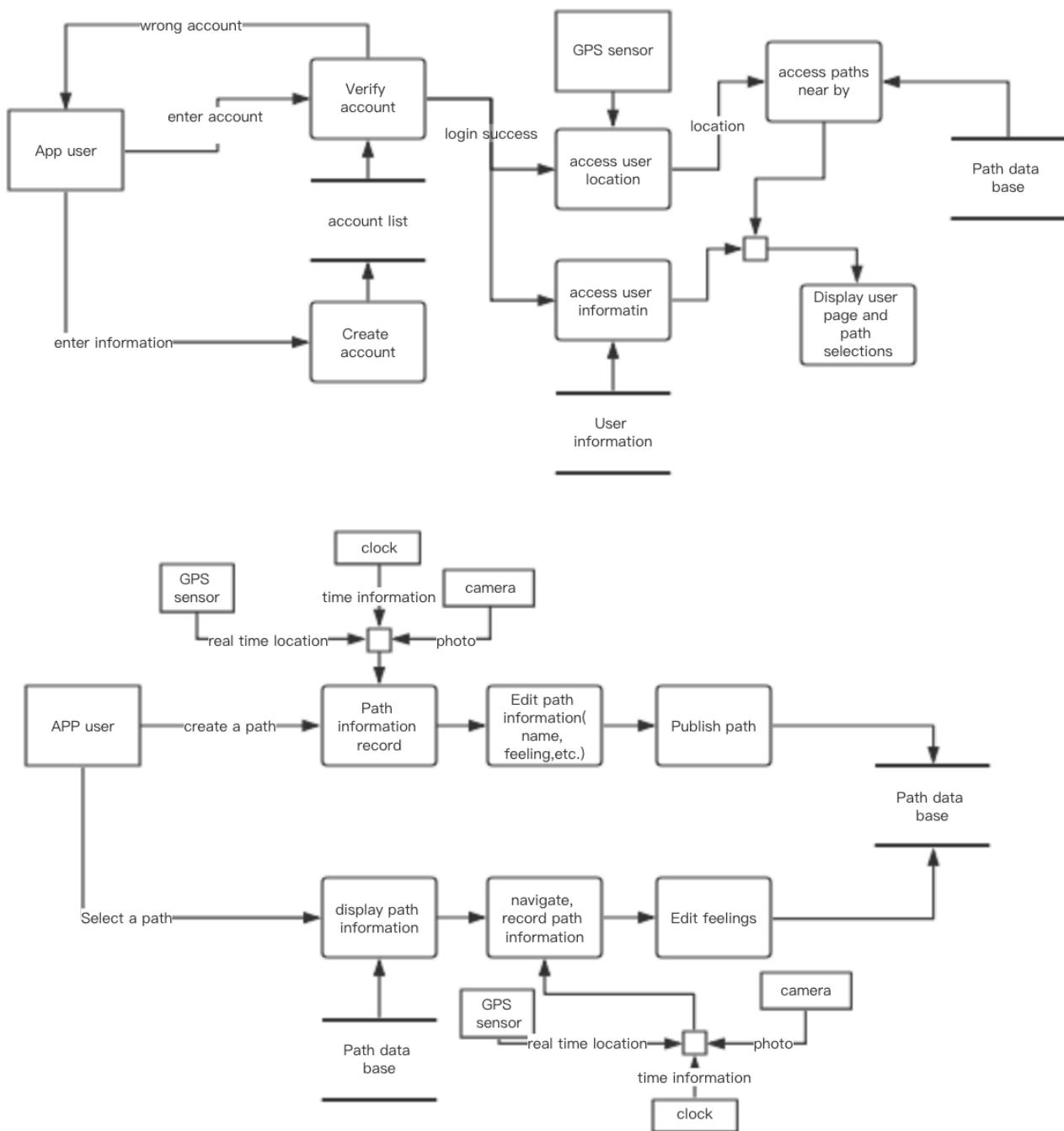


This process of decomposition may be undertaken to gain insight into the identity of the constituent components which may reflect individual physical processes of interest.

Interactions between the components are critical to the function of

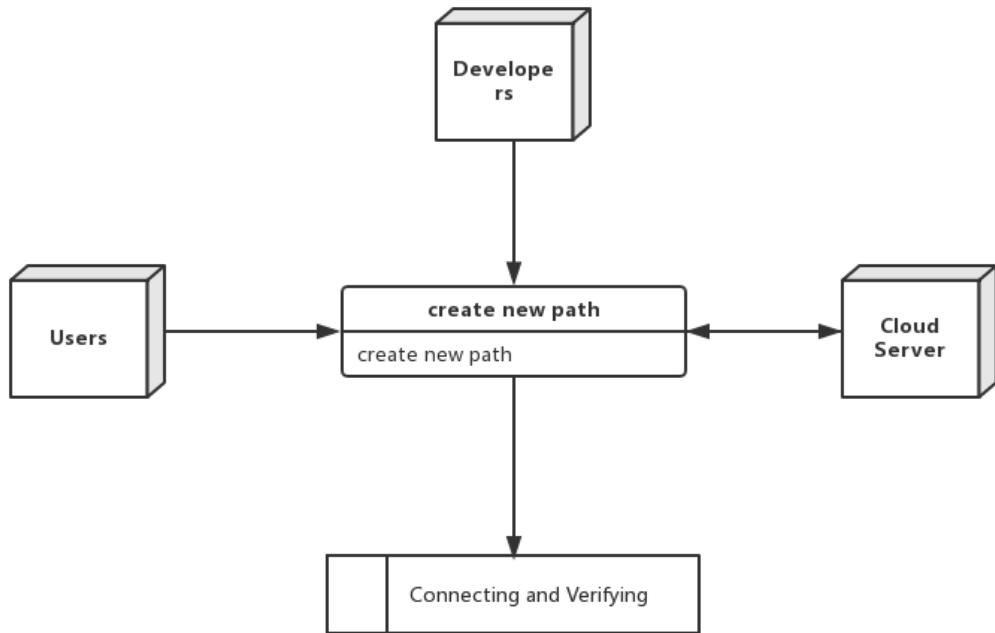
the collection. All interactions may not be observable, but possibly deduced through repetitive perception, synthesis, validation and verification of composite behavior.

3. System Context Data Flow Diagram (Full-Bodied)

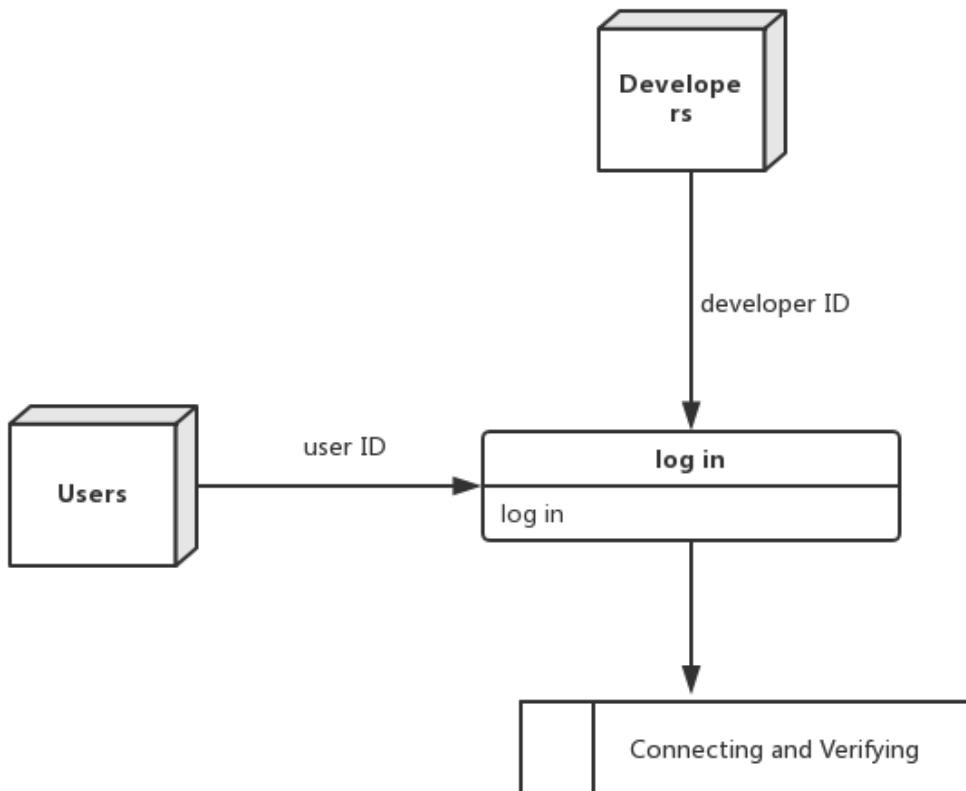


4. Event Diagram

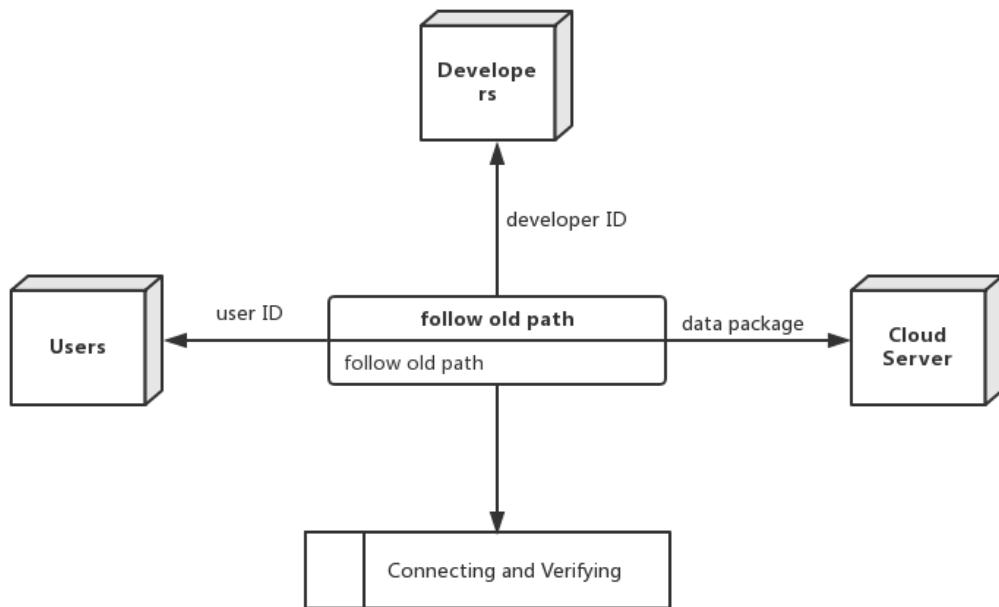
- Creating New Path



- Logging in

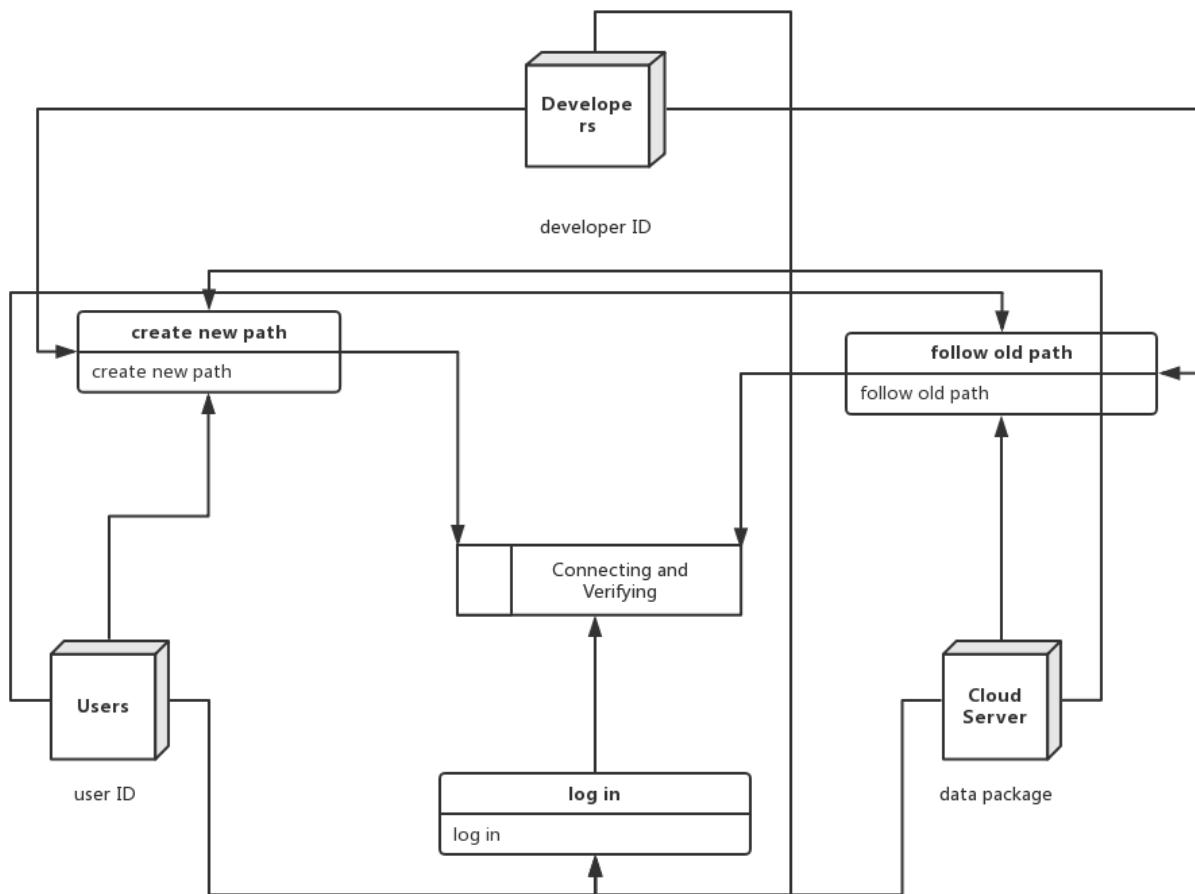


- Following old path



The event diagram shows only the event handler and the inputs and outputs for each other. One or more system diagrams are constructed by merging the event diagram. We can intuitively observe the relationship between events from the graph.

5. System Diagram



PART4

Database

1, Entities and Their Attributes

entity	attribute
pather	name
	location
	preference
	userID (PK)
	age
	gender
	socialMediaAccount
	e-mailAddress
	cell-phone
	distance
path	time
	energy
	compatibility
	type
	description
	coordinate
	pathID (PK)
path follower	compatibility
path definer	type

2, ER Model

PATHER(userID(PK), name, location, preference, age, gender,
socialMediaAccount, e-mailAddress, cell-phone)

PATH(pathID(PK), distance, time, energy, compatibility, type,
description, coordinate)

PATH_FOLLOWER(followerID(PK), compatibility)

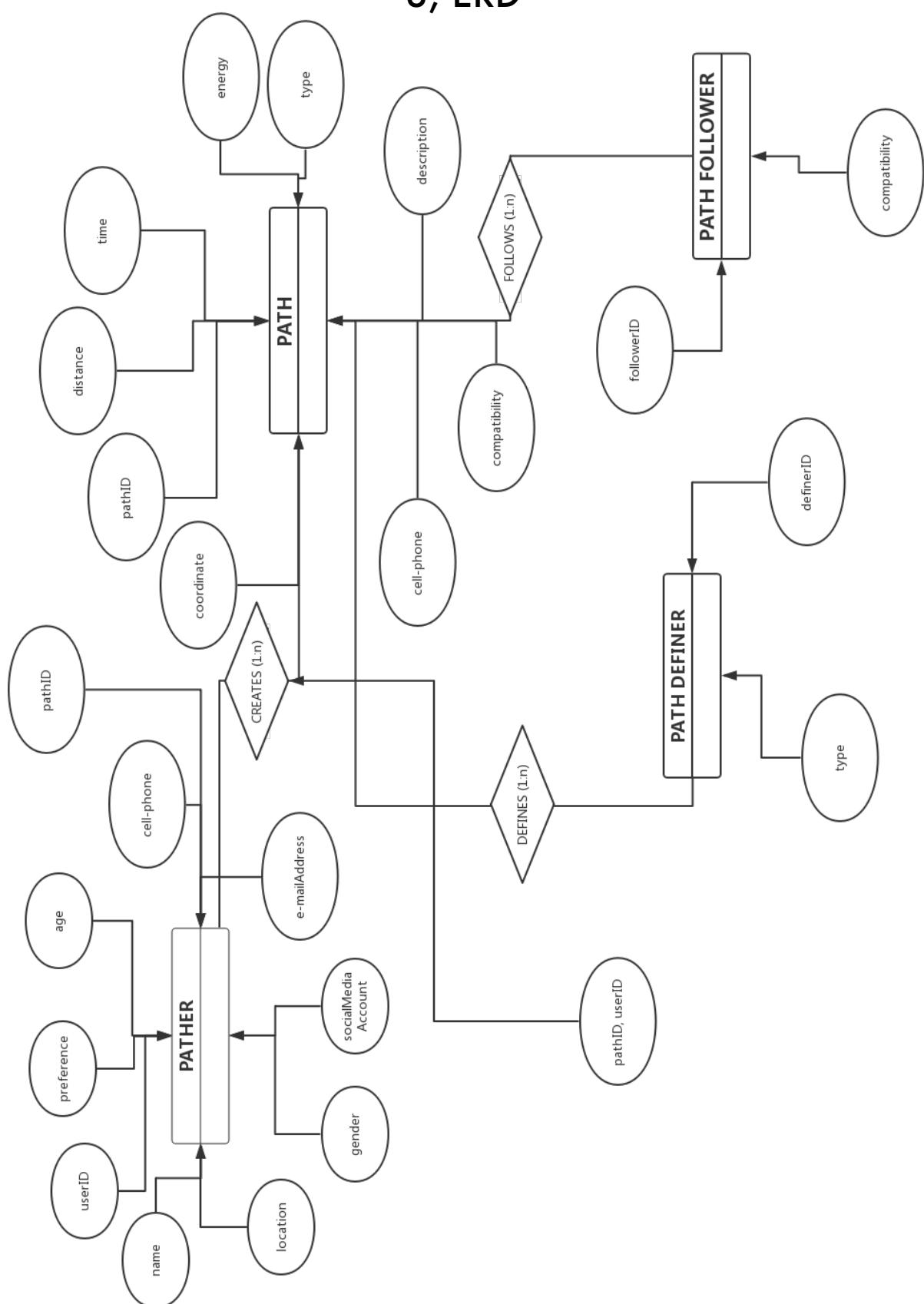
PATH_DEFINER(definderID(PK), type)

CREATES(userID, pathID)

DEFINES(definerID, pathID)

FOLLOWERS(followerID, pathID)

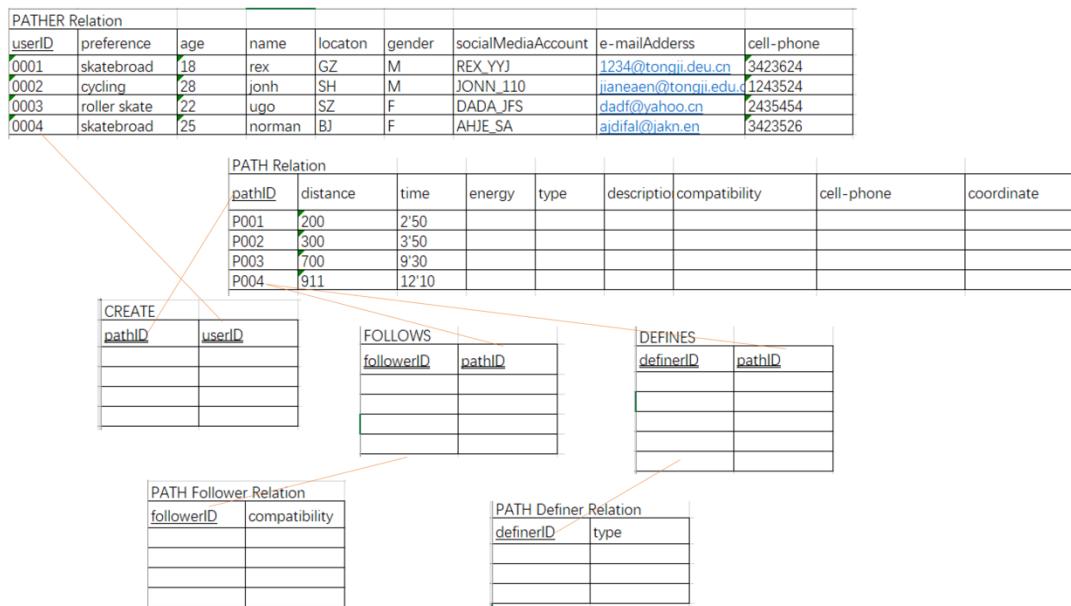
3, ERD



4, RD

PATHER Relation								
userID	preference	age	name	locaton	gender	socialMediaAccount	e-mailAdderss	cell-phone
0001	skatebroad	18	rex	GZ	M	REX YYJ	1234@tongji.deu.cn	3423624
0002	cycling	28	jonh	SH	M	JONN_110	jianeaeen@tongji.edu.cn	1243524
0003	roller skate	22	ugo	SZ	F	DADA_JFS	dadf@yahoo.cn	2435454
0004	skatebroad	25	norman	BJ	F	AHJE_SA	ajdifal@jakn.en	3423526

PATH Relation								
pathID	distance	time	energy	type	description	compatibility	cell-phone	coordinate
P001	200	2'50						
P002	300	3'50						
P003	700	9'30						
P004	911	12'10						



PATH Follower Relation	
<u>followerID</u>	compatibility
PATH Definer Relation	
<u>definerID</u>	type
CREATE	
<u>pathID</u>	<u>userID</u>
FOLLOWS	
<u>followerID</u>	<u>pathID</u>
DEFINES	
<u>definerID</u>	<u>pathID</u>

5, SQL

```
CREATE TABLE PATHER (
    userID      INT(20) NOT NULL,
    name        VARCHAR(200) NOT NULL,
    location    ENUM(longitude,latitude) NOT NULL,
    preference  VARCHAR2(200) NOT NULL,
    age         INT(5) NOT NULL,
    gender      CHAR(20) NOT NULL,
    cell-phone   INT(11) NOT NULL,
    e-mailAddress  VARCHAR(200) NOT NULL,
    socialMediaAccount  VARCHAR(200) NOT NULL,
    PRIMARY KEY (userID)
);
```

```
CREATE TABLE PATH (
    pathID      INT(20) NOT NULL,
    distance    INT(20) NOT NULL,
    time        TIMESTAMP() NOT NULL,
    energy      FLOAT(10,3) NOT NULL,
    compatibility  FLOAT(3,3) NOT NULL,
    type        CHAR(20) NOT NULL,
```

```
description  VARCHAR2(200) NOT NULL,  
coordinate    ENUM(longitude,latitude) NOT NULL,  
PRIMARY KEY (pathID)  
);
```

```
CREATE TABLE PATH_FOLLOWER (  
followerID      INT(20) NOT NULL,  
compatibility   FLOAT(10,3) NOT NULL,  
PRIMARY KEY (followerID)  
);
```

```
CREATE TABLE PATH_DEFINER (  
definerID      INT(20) NOT NULL,  
compatibility   FLOAT(10,3) NOT NULL,  
PRIMARY KEY (followerID)  
);
```

```
CREATE TABLE CREATES (  
userID  NUMBER REFERENCES PATHER,  
pathID   NUMBER REFERENCES PATH,  
PRIMARY KEY (userID, pathID)  
);
```

```
CREATE TABLE FOLLOWS (
    followerID    NUMBER REFERENCES PATHER,
    pathID        NUMBER REFERENCES PATH,
    PRIMARY KEY (followerID, pathID)
);
```

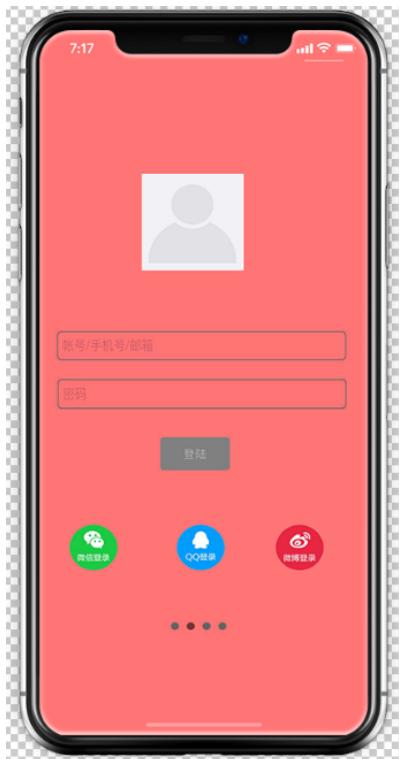
```
CREATE TABLE DEFINER (
    definerID    NUMBER REFERENCES PATHER,
    pathID        NUMBER REFERENCES PATH,
    PRIMARY KEY (definerID, pathID)
);
```

PART5

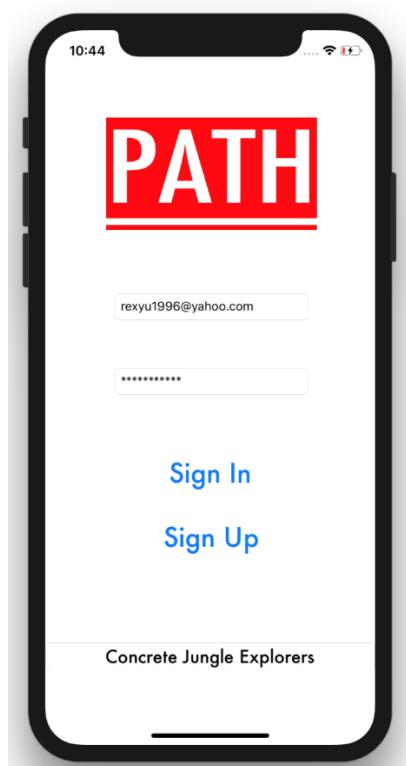
Final Achievement

UI Design & Logic Completion

1) Login Page :



(design version)



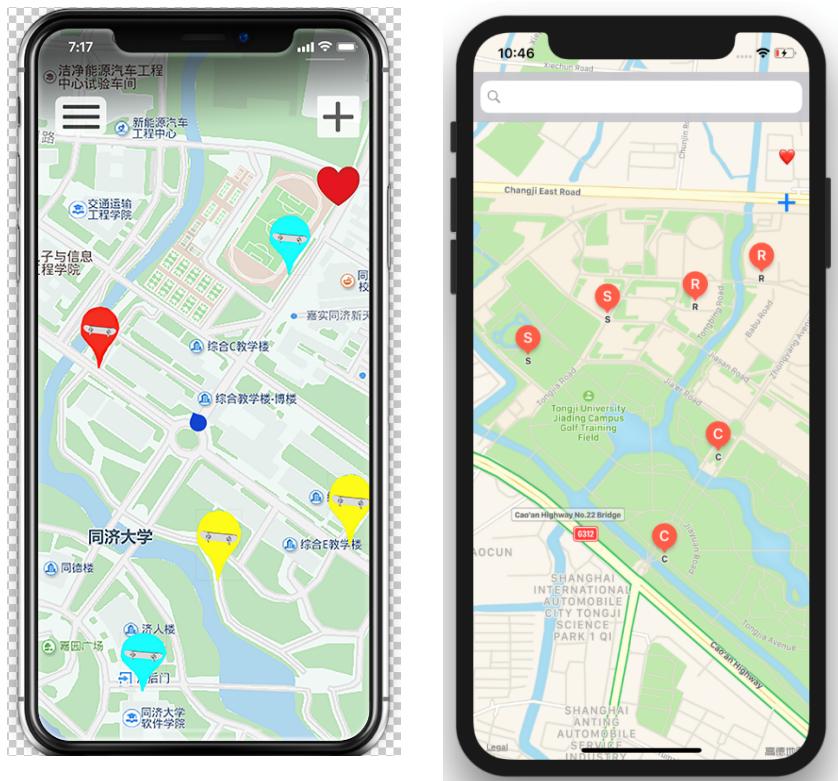
(final version)

PATH basically consist of red, black and white three colors.

The page on the left is the preview we designed at the beginning. The page on the right is the interface that will be displayed to the user. As you can see, compared with what we initially thought, we finally decided to use a simpler white

background. The final interface is simpler and clearer, giving users a better visual experience. At first, we wanted users can log in with normal PATH account as well as QQ, WeChat or Weibo account, which is convenient for everyone to use. However, due to time reasons, we did not connect our app the third-party API. So, for the time being, you can only log in with a Path account.

2) Main Interface



When the user clicks log in, they will see the main interface.

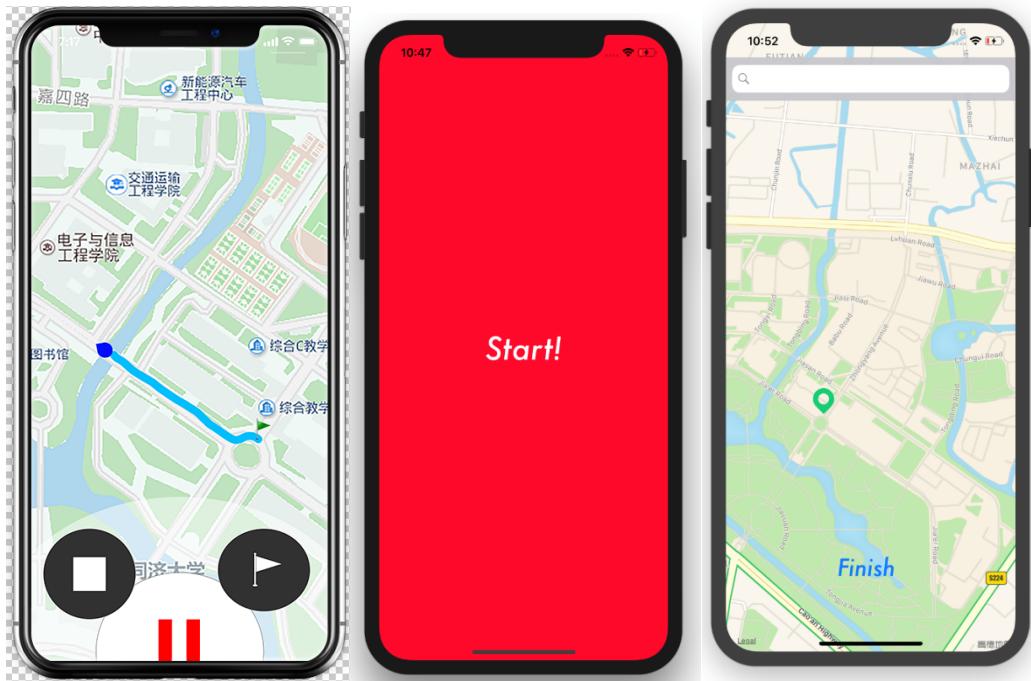
When we were designing the main interface, we have considered whether we should use spots or lines to represent these "redefined"

paths. And last we decided to use spots since they can help users find those interesting paths close to them more clearly and will not make the screen a mess. And when we were designing, we preferred to use pictures to represent the spots. But when we were actually coding, we found it difficult to turn these spots into picture. So, we use characters to represent different functions of the paths. "C" represents cycling paths, "S" represents skating paths and "R" represents roller skating paths.

And the rectangle on the left-hand side with several lines in it is the setting button. "+" is a button to create a new path. And the red heart is to select your interested kind of paths. There will be more specific description in the passage below.

In the design of the main interface, we made adjustments to colors, icon sizes, and shapes. Compared with the initial design interface, the actual interface is more beautiful, and the user will find the function he wants to use more easily when he uses it.

3) Create a Path



(design version)

(final version)

In the main interface, there is a button with “+” on the right-hand side. Press this button you will enter the page, beside it is “create” page.

Compared to the initial design, before the creation of the interface, we designed a "start" interface with a red background, which makes it easier for users to understand the purpose of the creation interface. At first, we design this page can obtain your location with the GPS sensor inside you phone and mark your trace on the map. At the bottom of this page there are three buttons, which are “end”, “start/pause” and “tagged”.

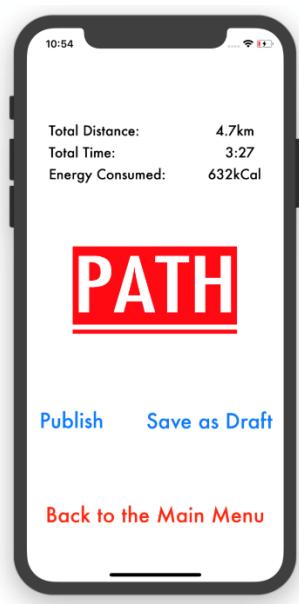
However, at present, we have only completed the positioning to the current position. Since there still remain some technical

problem, we can't show the moving target on the map to show user's location.

4) Publishing page



(design version)

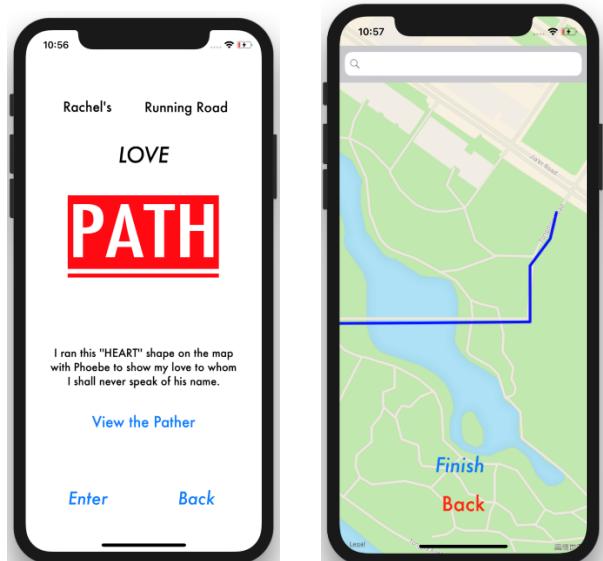


(final version)

In this page, user can see some data about their trip, including time, distance, photos, written words and etc. User can also edit the name, the function of this path and add some interesting things here. After finishing editing, user can publish this path.

We have modified the content layout of the publishing interface in the final version, which is more simple and straightforward.

5) Go through a path



When user press a spot on the map of main interface, a new page pop-up. In this page, it shows what the creator recorded, including the brief information of the creator, basic information of the path, pictures of this path and etc. Base on the words and pictures, user can have a brief idea of this path and decide whether to go through it or not.

Compared with the initial design, the current interface information

is more complete, and the user can better understand the specific information of the creator of the path and path before starting the path.

PART 6

Testing

Location testing

Target achievement:

Locate user's current location and set it as the center of map view and show a blue spot to visualize it.

Testing method:

Change the customer location of the simulator in Xcode and check the map view

Result:

App can locate user's location and set it as the center of the map view. But the blue spot cannot show on the map. Check the code of drawing spot but there has no error. So here remains an unsolved bug.

Path Type Selection Testing

Target achievement:

Map on the main page only shows the paths of the selected types.

Testing method:

Test all combination of the selected type and check the result

on the main page.

Result:

Fully function.

Segue Testing

Target achievement:

Pages of app can segue properly and can return to the main page finally.

Testing method:

Try every button on the screen and record all segue path.

Result:

Fully function.

Path information transmit testing

Target achievement:

When you click on the different path on the screen, you can see different path type and name and jump to a page with specific information of the path.

Testing method:

Create data packages of different paths and connect them to specific spots on the map. User click different spot and jump to the detail page to check the information in it.

Result:

Fully function.

Record Path Testing

Target achievement:

When you enter a recorded path, you can see it being plotted on the map and move when the map moves.

Testing method:

Extract the path information in a data package and plot it on the map and check the movement of path line and the map.

Result:

Fully function.

PART 7

Personal Experience and Growth

1. Yu Yanjia

As the captain of this project, I think I have learned a lot in this semester. At the very beginning, we spent a lot of time to discuss what we were going to do. It was hard to decide because everyone had their own idea. But after several times of discussion, we decided to make this path based social app. And the most important reason was that it was a totally new idea and there is few similar app in the app store. Though it also meant it would be difficult to finish, we were willing to try. I think this is one of the best parts of this course: we decide what we are going to do, and we decide what we are going to get.

During the process of the project, we have learnt the methods to run the project, to communicate with our sponsors and our work partners form the class. But we also have learnt how to use a new coding tool with a new coding language and how to deal with those uncountable errors which we have never been seen in the program. So, for me, this project not only gives me the experience

of creating a software, the improvement my coding skill, but also make me sure that I should be a HARDWARE engineer in the future.

2, Zhao Yun

As the course of software-engineering comes to an end, our project, PATH, also comes to its final processes. Just last week we've had out testing where we had our potential users and investors try out the latest version of our application.

Looking back, I can still clearly remember the first day when we three sat together and started brain-storming on our project. It was Yanjia who came up with this idea, which is a bit hard to understand, I confess.

In this whole process, I acted the part of partially a programmer, and partially a UI/UX designer. When this originally started, I was a little overwhelmed, it seemed the design and the programming, which are the two biggest parts of our project, have already been taken by my two teammates, I didn't know what to do, and I didn't know my position in the team, a bit like a nobody, but then after I had a good talk with my teammates and self-reflected and assessed my abilities, I decided to involve myself in a bit of both. Ergo, in report 2, I was able to complete both the report and the presentation without much of my teammates' help because they

were then occupied in other affairs, after that, I engaged myself to my challenging work such as the build-up of the data-base, and I volunteered to take over the visual design of our presentation, slides, application and report, which to my surprise, turns out pretty well after all.

Anyway, I guess the most valuable lesson I've learned from this project apart from the practical programming experiences is that you have to try, don't be afraid of failing, the biggest failure is that you never try.

3, Zhao Binqi

Through a semester of software engineering, I have learned a lot of surprises. Before I started learning this course, I thought it was a course of learning how to write programs in c or C++. In the first lesson, the teacher told us to let us make an app in groups. At that time, I thought it was a matter that was almost impossible to achieve. It was really difficult to make an app without a foundation, but it turned out that with the correct guidance of the teacher, we finally did it! In the beginning, we had no idea what we were doing. After the collision of the team's ideas, we finally decided that we wanted to do an app named "path".

Before report1, we have a lot of problems that need to be

resolved in each group discussion. However, we have not been overcome by difficulties. The problems have been solved by us one by one.

At the same time, we also have to prepare to officially start the app. At this time, our mood is very tense because we are all worried that we will not be able to finish it because of technical problems. The part I was responsible for was the creation of a large framework for UI design and page jumps. At the beginning, I learned a lot of ways to build a framework through code, but in the end, I found that we could build it through main storyboard in Xcode. This saves us a lot of time.

Before the report 2, we learned a lot of drawing methods of UML diagrams. Through these graphics, we have a clearer understanding of page jumps, page content, etc. At this point, there was a new problem with the app. When we used the initial map (Amap), we found that we couldn't directly display the location of the user on the page, and we couldn't implement the following path. My other two partners started to solve these problems through code.

At the same time, we prepared report 3, we are also preparing for the final demo show. At this time, our app already has a prototype and can be downloaded to a mobile phone. I can't

believe it! We did it!

Throughout the semester, I learned a lot of skills. I learned the whole process of an app from an idea to the final product, which is really amazing! I learned how to draw UML diagrams. This is the skills we will need in our professional studies. I learned the importance of teamwork, and many things can only be done by one's ability. I have learned to face difficulties and do not give up easily. Under our common efforts, we will definitely solve them! In this class I really learned a lot, not only about the professional knowledge of programming and developing apps, but also a lot of very important personal skills! It's really cool!