

Systems Analysis and Design

Instructor : Huang, Chuen-Min

Teamwork1 ver.2

Group 1

ID	Name
B10423002	Leon
B10423003	Kurumi
B10423009	Jerry
B10423015	Justin
B10423032	Kevin
B10423041	Dan
B10423045	Rong
W10423301	Ben
A10523050	Ian

Date 2017/11/27

Content

Introduction	1
Use case Diagram	2
Use case Description.....	3
1. Record Daily Life	3
2. Record Physical State	4
3. Manual notify emergency situation.....	5
4. Automatically notify emergency situation (the most important)	6
5. Notify emergency situation	8
Activity Diagram.....	9
1. Record Daily Life	9
2. Record Physical State	10
3. Manual notify emergency situation.....	11
4. Automatically notify emergency situation (the most important)	12
5. Notify emergency situation	13
Sequence Diagram	14
Class Diagram	16
Behavior State Machine.....	18
Participate In Assignments	20

Introduction

I think you may hear that xioami mobile wristband, which can record your daily life and medical health data, like calorie consuming, the distance of your walking, the health rate and so on. We think these product is very functional and portable because just wear it, so we want to try this concept; moreover, we supply another very innovative and still practical function called emergency notification. This function is our core function. When you encounter the dangerous situation, no matter is drowning, fire or mountain difficult, at that moment, you maybe are fearing and want to escape from that place, or maybe the phone is not on your hand; but don't worry, the system can help you locate the position and send SOS messages to rescue team. As a result, you don't need to worry that if you are in danger, but nobody aware it; our system will guarantee you still have the chance to be found by rescue team.

Use case Diagram

The survival wristband system consists of two main functions: record life state and rescue asking state.

In normal time, after user set the settings at the first time they use it, system will Record Daily Life State, like Body fatness (Calorie), Steps, sleeping time etc, and Record Physical State, such as pulse, temperature. These recorded data will be saved in medical history.

When users run into accidents, there will be two conditions: The first one is that when Record Physical State detects unusual physical data. It will perform the Automatically Notify Emergency Situation to identify the accident condition automatically.

No matter it is drowning, mountain accident or fire. After wristband system gets accident conditions, it sends messages to notify emergency situation to connect with the rescue team.

When Record Physical State do not detect unusual physical data by itself, and you are surely in an accident. The user can Manually Notify Emergency by pressing emergency button over 5 times, then it send message to emergency contact person to ask for help.

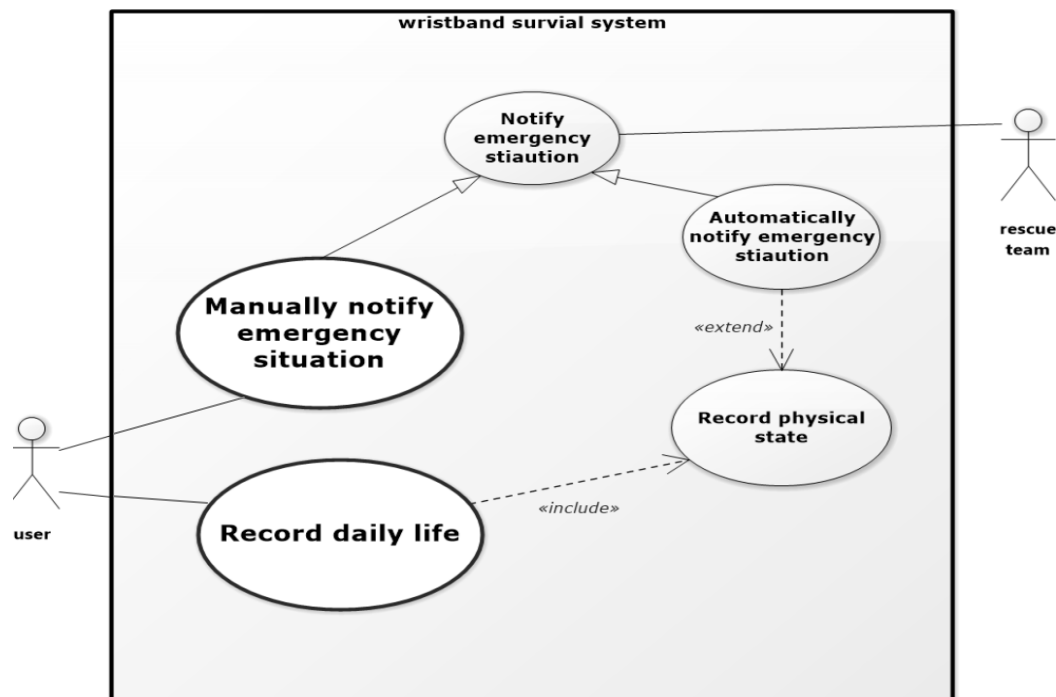


Figure 1 use case diagram

Use case Description

1. Record Daily Life

Use Case Name:	Record Daily Life	ID:	1	Importance Level:	High
Primary Actor:	User	Use Case Type:	Essential, Detail		
Stakeholders and Interest: User - wants to record daily states and medical history, have a crisis management process when he/she meets trouble. Rescue Team– when receive notification then execute rescue.					
Brief Description: Record user’s daily life, include sleep, distance, calorie, and updating medical history.					
Trigger:	Sign up new account and connecting with mobile device.				
Type:	Internal				
Relationship: Association: User Include: Record physical states Extend: Generalization:					
Normal Flow of Event: 1. Login the system If user has account, go to N-3. If user doesn’t have account, go to N-2. 2. Complete personal information form. 3. Connect to the mobile device. 4. System record daily states and execute Record Physical State (another use case) and system update the medical history of user, then synchronize to mobile in real-time.					
Sub Flow:					
Alternative / Exception Flow: 3-a: If connect to mobile device failure, prompt select option if cancel then exit use case, if retry then reconnect to the device. 4-a: If communication to mobile device failure, retry to communicate to mobile device.					

2. Record Physical State

Use Case Name:	Record Physical State	ID:	2	Importance Level:	High
Primary Actor:	User	Use Case Type:	Essential, Detail		
Stakeholders and Interest:					
User - Wants to record his/her physical state like pulse, temperature, medical history.					
Brief Description:					
Record user's physical states, such as pulse, and body temperature updating to medical history in real-time.					
Trigger:	After user complete the personal information form or system update data.				
Type:	Internal				
Relationship:					
Association:					
Include:	Record daily life				
Extend:					
Generalization:					
Normal Flow of Event:					
1. Record physical data.					
2. Storage each data by it's type like pulse, body temperature.					
3. Update physical data of user into medical history.					
4. Analysis each data and detect if it's normal or not					
If data is normal, execute S-1.					
If data is abnormal, execute S-2.					
Sub Flow:					
S-1: After analyzing, if data is in the normal range of Medical history then back to step1 for receiving more data.					
S-2: After analyzing, if data is out of the normal range of Medical history and it still out of average longer than 30 seconds then Execute Automatically notify emergency situation use case.					
Alternative / Exception Flow:					
5-a: If data is normal, but the system state is idle for too long time, then execute automatically notify emergency situation.					

3. Manual notify emergency situation

Use Case Name:	Manual notify emergency situation	ID: 3	Importance Level: High
Primary Actor:	User	Use Case Type: Essential, Detail	
Stakeholders and Interest: User - who ask for help. System - provides functions for user.			
Brief Description: User manual operates the system, to send the signal to rescue team in order to ask for help.			
Trigger:	When user is in dangerous situation, user presses button over 5 times.		
Type:	External		
Relationship: Association: User Include: Extend: Generalization: Notify emergency situation			
Normal Flow of Event: 1. The system will locate current position. 2. The system notifies rescue team set by user and send position message. 3. The system check rescue message be received or not. If system receive rescue team's return message, the process end. If system does not receive rescue team's return message, go back to step2.			
Sub Flow:			
Alternative / Exception Flow: 1-a: The system can't connect to the GPS server, it will retry until it successfully can connect it. 2-a: If the message can't be sent by system, it will retry until it successfully can be sent out.			

4. Automatically notify emergency situation (the most important)

Use Case Name:	Automatically notify emergency situation	ID: 4	Importance Level: High
Primary Actor:	User	Use Case Type:	Essential, Detail
Stakeholders and Interest: System - will send emergency notification to rescue team to help user. Rescue team - will receive the notification when the system sends emergency message.			
Brief Description: System sends notification automatically to rescue team when user encounters accident.			
Trigger:	After system analyzes the user's physical or daily state which is abnormal, then execute this use case.		
Type:	Internal		
Relationship: Association: Include: Extend: Record physical state Generalization: Notify emergency situation			
Normal Flow of Event: 1. System will locate current position. 2. The system will identify the danger situation type according the physical and daily state data. If hands shake frequently and then hands stop shake for one minute or hypothermia, do S2-1-1. If the system state is idle for long time, do S2-2-1. If the room temperature is over 150 Celsius, do S2-3-1.			
Sub Flow: S2-1-1: The system sends emergency text and current position message to lifeguard. S2-1-2: The system checks the message state. If a message is received by lifeguard, the process will end. If not, return S2-1-1. S2-2-1: The system sends emergency text and current position message to mountain rescue team. S2-2-2: The system checks the message state. If a message be received by mountain rescue team, the process will end.			

If not, return S2-2-1.

S2-3-1: The system sends emergency text and current position message to firefighters.

S2-3-2: The system checks the message state.

If a message be received by firefighter, the process will end.

If not, return S2-3-1.

Alternative / Exception Flow:

1-a: If the system can't connect to the GPS server, it will retry until successfully it connect to GPS.

2-1-1-a: If the message can't be sent by system, it will retry until it successfully can be sent out.

2-2-1-a: If the message can't be sent by system, it will retry until it successfully can be sent out.

2-3-1-a: If the message can't be sent by system, it will retry until it successfully can be sent out.

5. Notify emergency situation

Use Case Name:	Notify emergency situation	ID: 5	Importance Level: High
Primary Actor:	User	Use Case Type:	Essential, Detail
Stakeholders and Interest: System -- send the notification Rescue team -- receive the notification			
Brief Description: System sends the signal to rescue team			
Trigger:	Send the signal to rescue team when user in danger situation		
Type:	Internal		
Relationship: Association: Include: Record daily life Extend: Generalization: Manual notify emergency situation, Auto notify emergency situation			
Normal Flow of Event: 1. System locates current position, No matter trigger by auto mode or manual mode. 2. The system notifies the rescue team danger situation with position and emergency messages. 3. The system checks rescue message. If system receive rescue team message, exit this use case. If system do not receive message, go back to N-2.			
Sub Flow:			
Alternative / Exception Flow: 1-a: The system can't connect to the GPS server. 2-a: The system can't connect emergency call.			

Activity Diagram

1. Record Daily Life

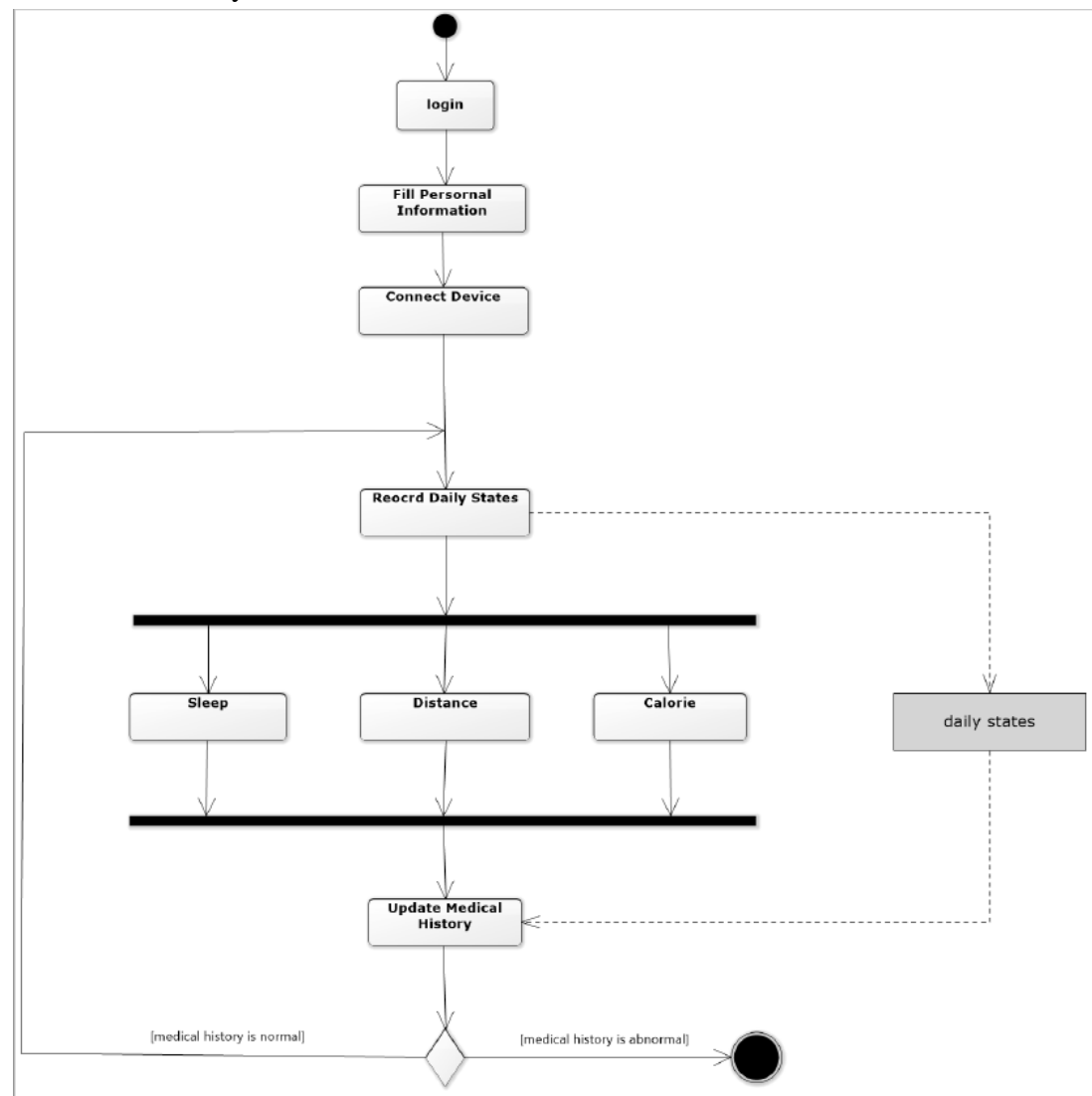


Figure 2 activity diagram - Record Daily Life

2. Record Physical State

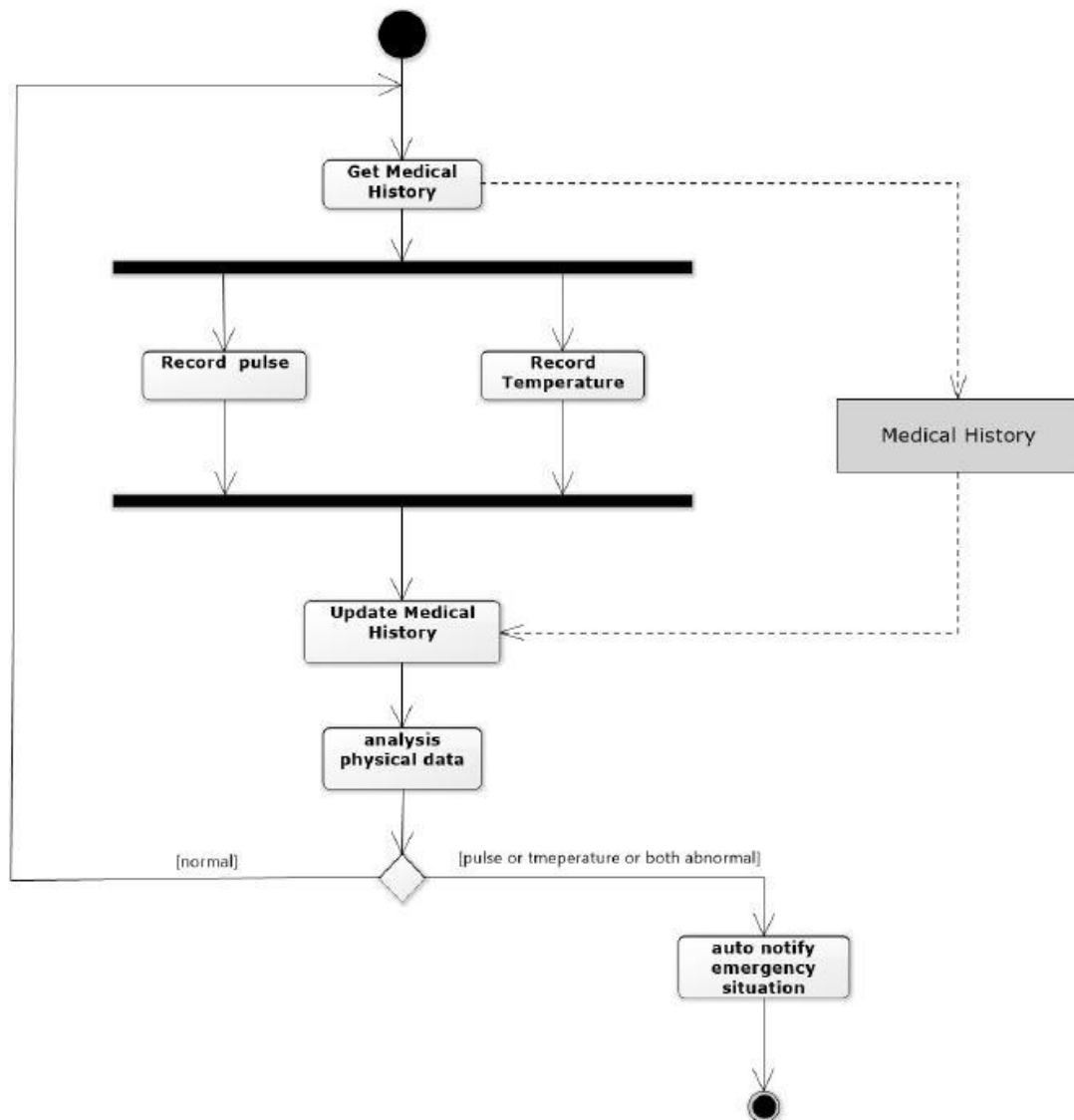


Figure 3 activity diagram – Record Physical State

3. Manual notify emergency situation

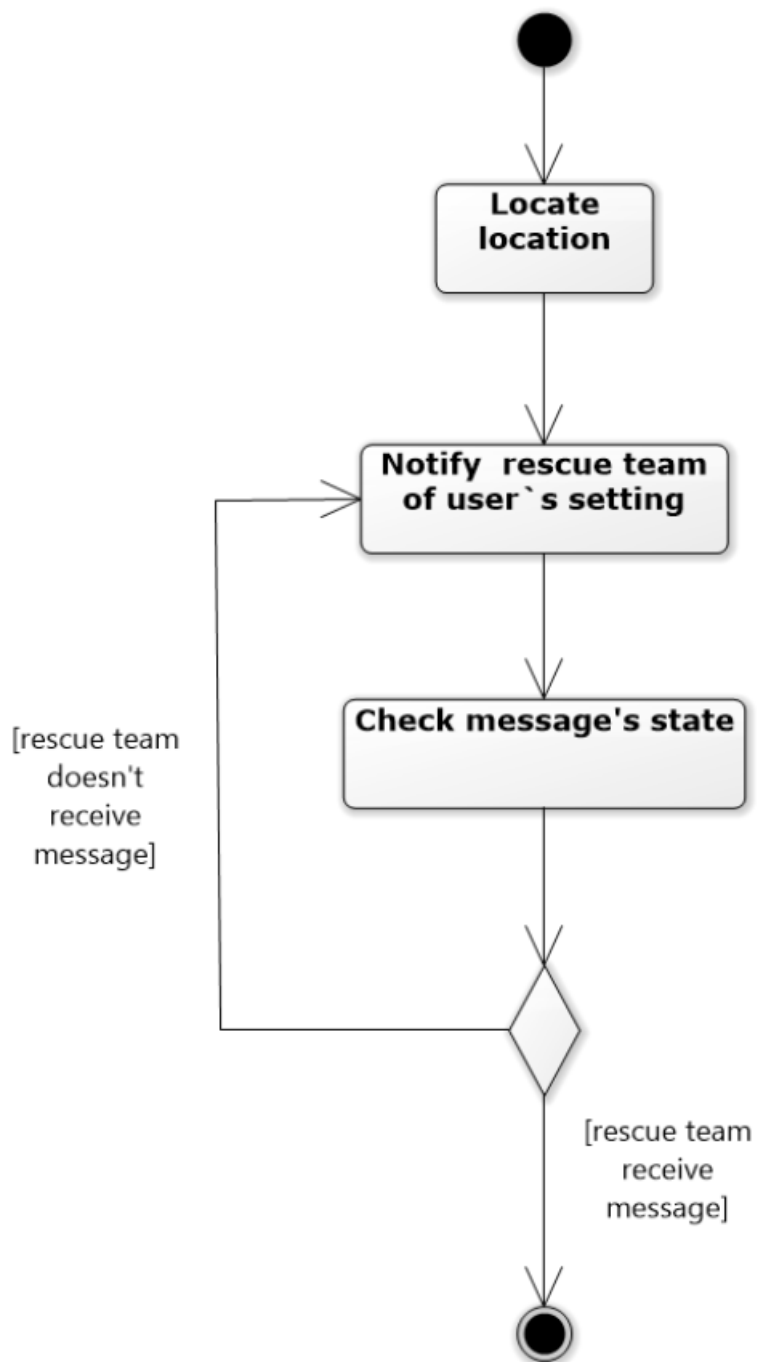


Figure 4 activity diagram – Manual notify emergency situation

4. Automatically notify emergency situation (the most important)

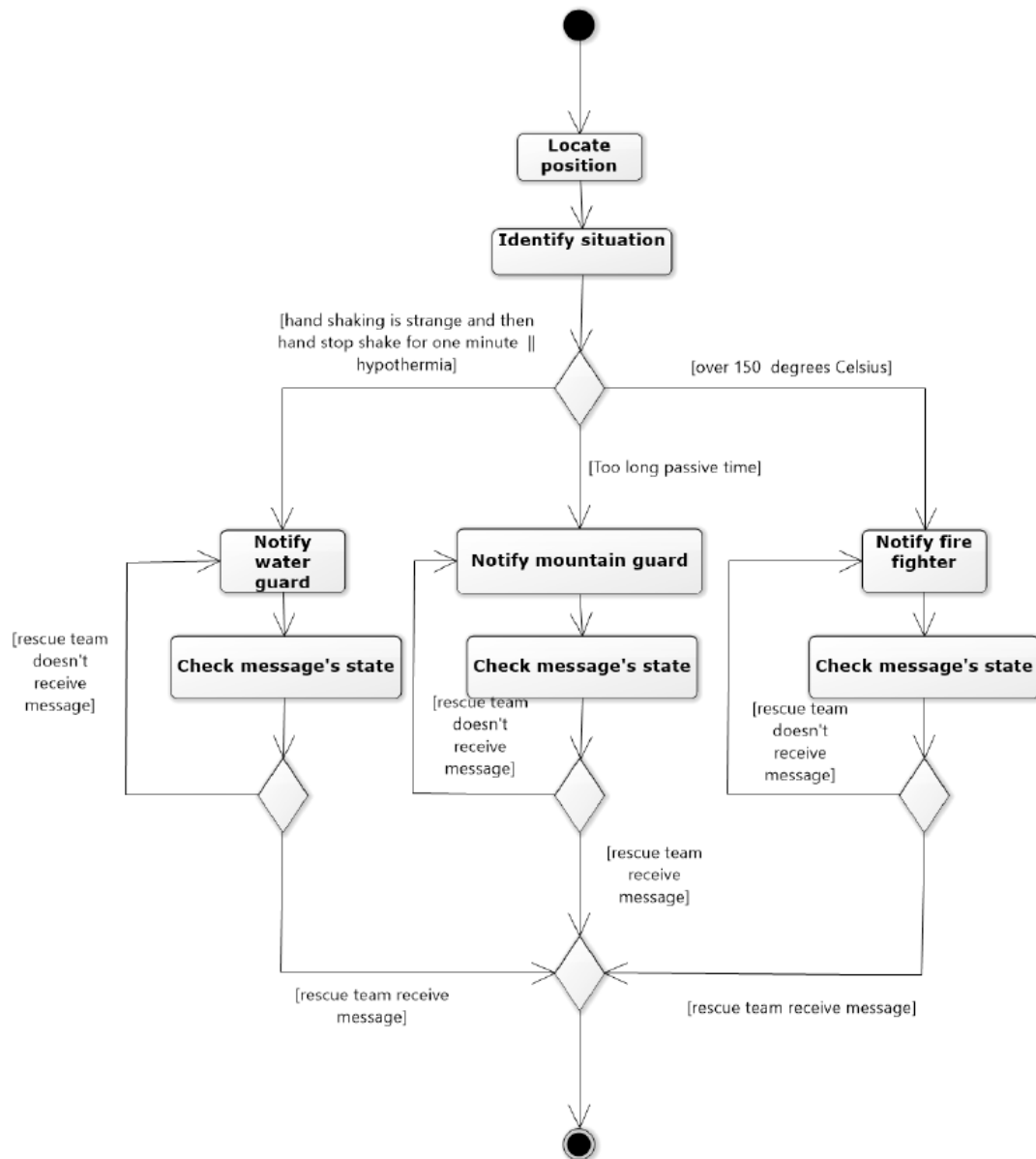


Figure 5 activity diagram - automatically notify emergency situation

5. Notify emergency situation

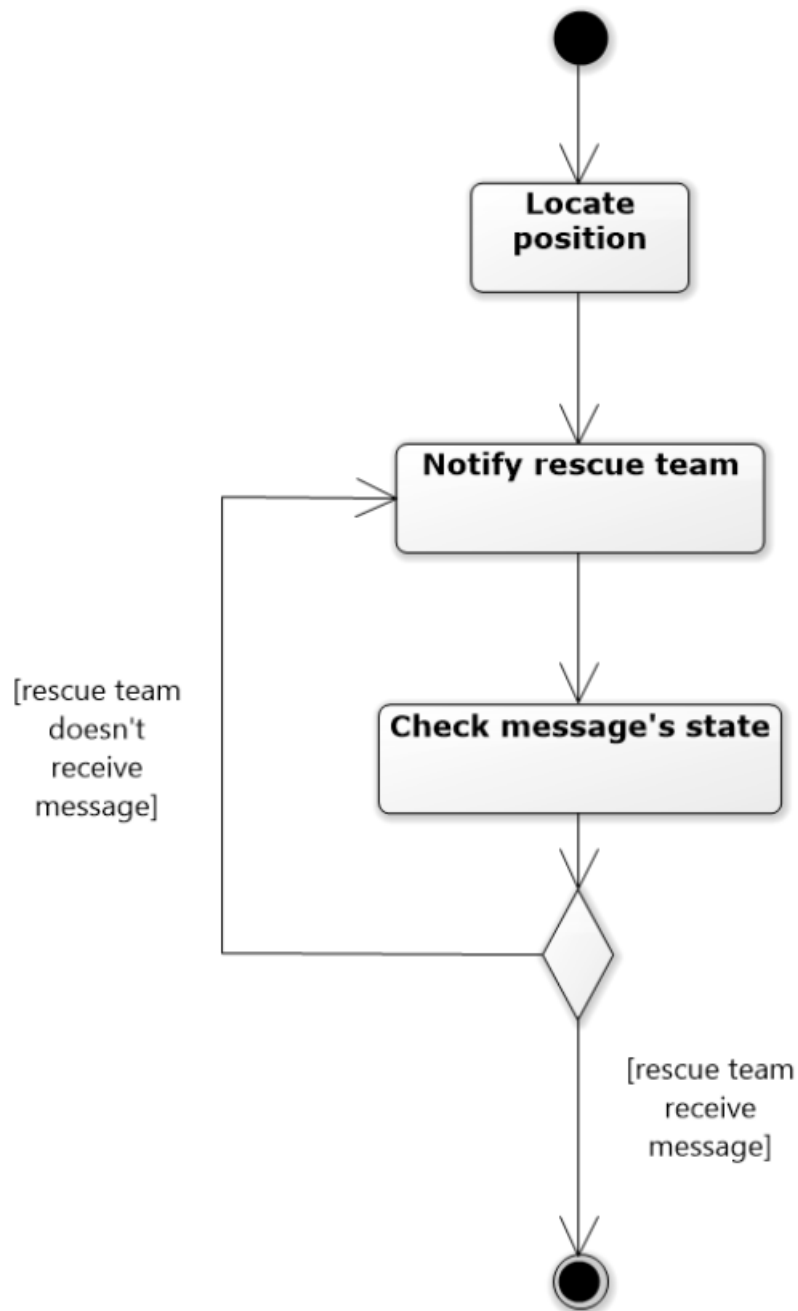


Figure 6 activity diagram – Notify emergency situation

Sequence Diagram

Previous scenario, when user encounter an accident, the medical history detect abnormal states from daily or physical states.

First, wristband system call GPS to locate the user current position, when GPS return the location, system call Rescue Team to set user position.

Second, wristband system call Dangerous Determiner to identify Emergency Situation by the data of temperature, pulse and idle time.

Third, if Dangerous Determiner identify user in drowning dangerous by the condition of [hand shaking is strange and then hand stop shake for one minutes, or hypothermia], then wristband system set Emergency Situation is drowning.

Forth, wristband system start the loop process whose discriminant condition is notifySuccessfulorNot attribute whether be false. After entering the loop, system call Rescue team class to notify Emergency, then the rescue team class will call rescue team server to check message whether be received. If the message be received, the recieveSuccessfulorNot message will be true and back to rescue team class, then assign notifySuccessfulorNot message is true and return to system, then leave the loop; if the message is not be received, recieveSuccessfulorNot will be false and notifySuccessfulorNot also be false, so the loop will execute again.

The other emergency condition deal the process with same approach by 3-4 step. However, use the different condition to identify different emergent situation.

i.e. firing dangerous – [over 150 degree Celsius]

mountain accident – [too long passive time]

After finishing the selection block, the system will display the message successfully be received to user.

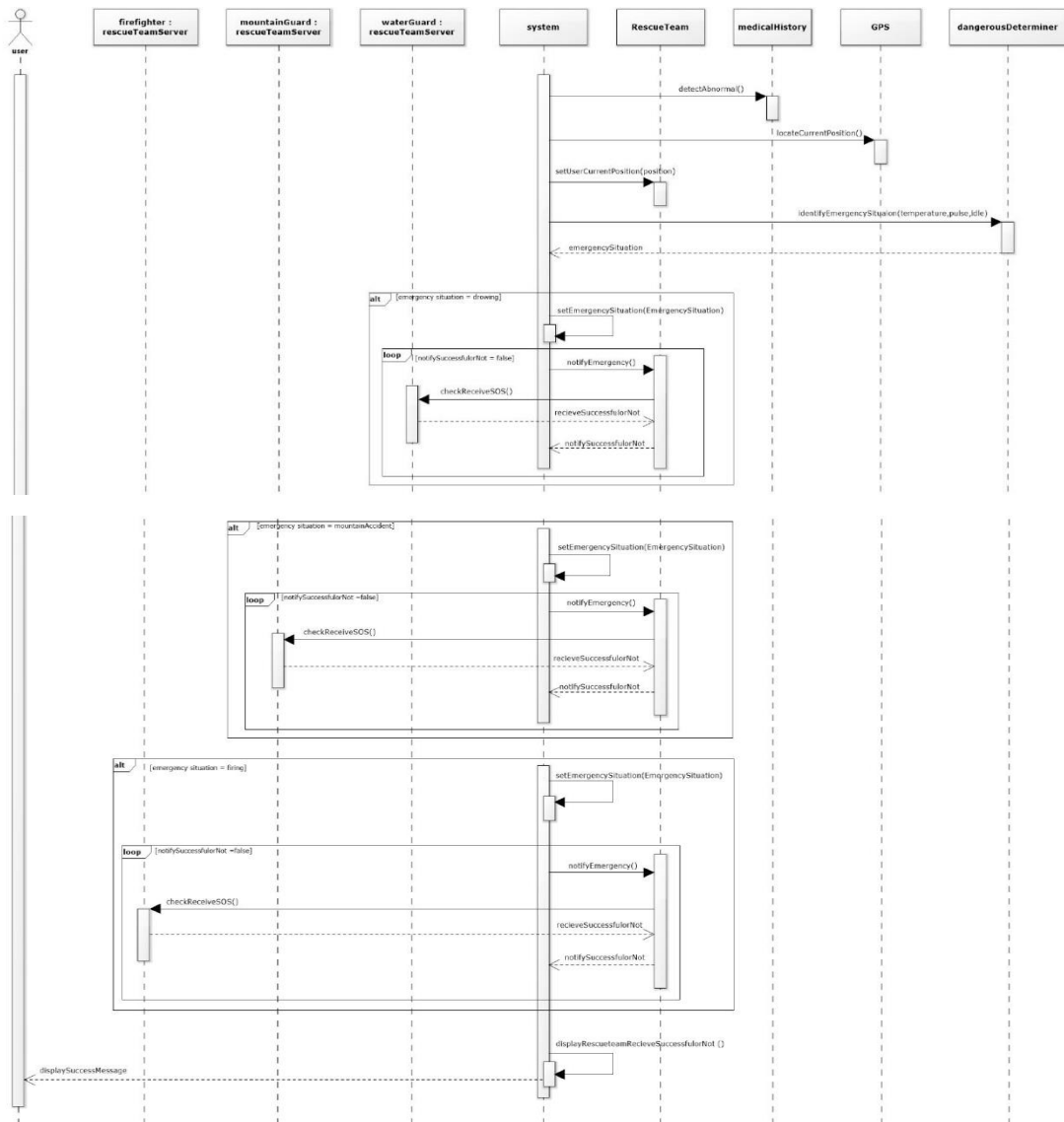


Figure 7 sequence diagram - Automatically notify emergency

Class Diagram

When use the wristband system, user need to sign up or log in an account through the Application page <UI>. When successfully login, the application will connect with the wristband system, then the system started tracking the personal states. While the medical history detect abnormal states by daily states and physical states, the wristband system will call Dangerous Determiner to identify what the emergent situation is user encounter. When Dangerous Determiner return the emergency message to wristband system, then wristband system let rescue team know user current position and call them to notify emergency to fire fighter, mountain guard or water guard. The rescue team class will call server to check message whether be received or not. If not, do again, if it is successful, then wristband will display rescue team received message successfully.

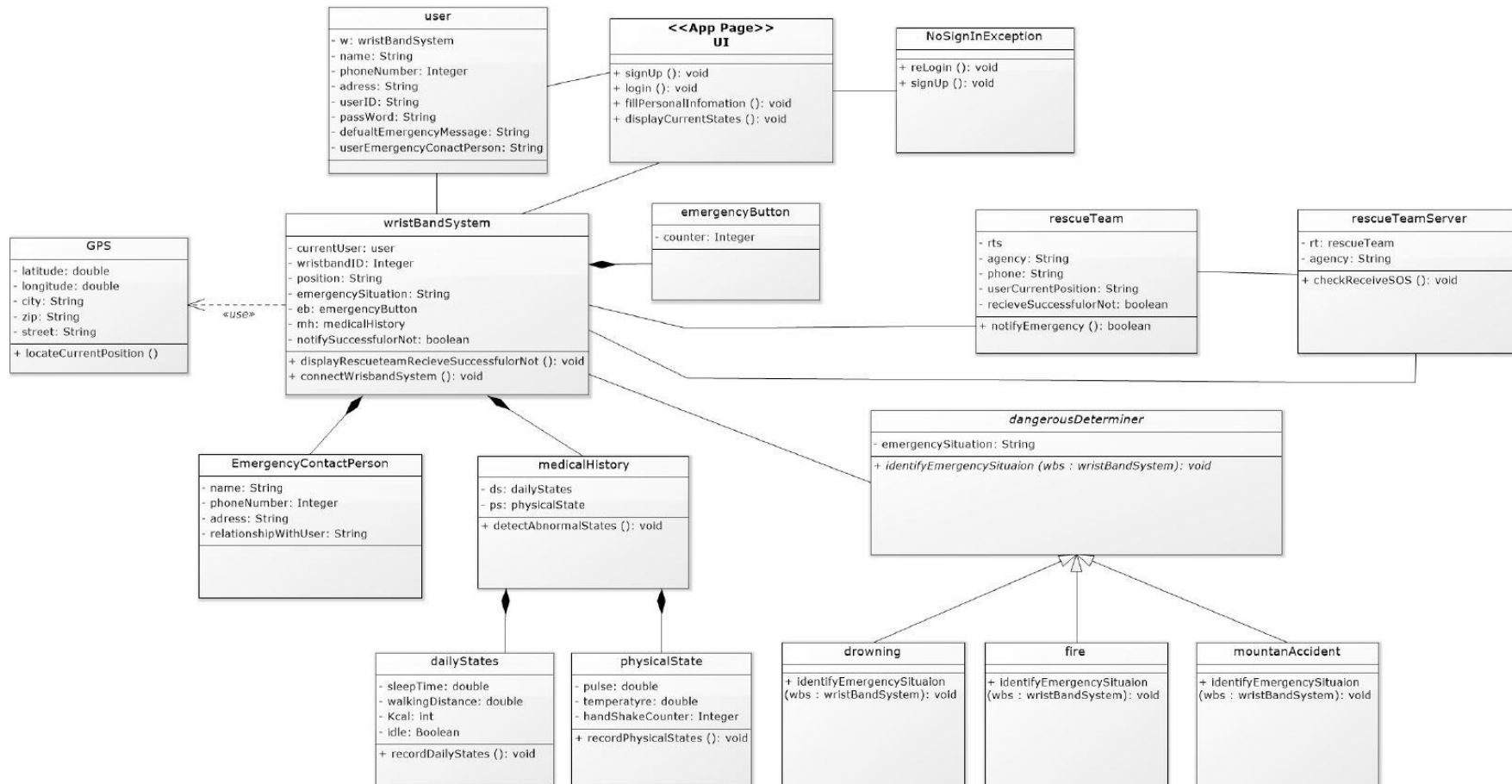


Figure 8 Class diagram – wristband system

Behavior State Machine

The behavior state machine is showing how wristband change state. The initial trigger is turn on and it will enter the standby state, then the user login the system, the system will enter recording state. In this state, the system track the personal states and medical state data whether is normal, if is normal, it will keep tracking; if not, the system will enter emergency state. In this state, the system notify the rescue team and check whether message be received or not, if not, keep notifying and checking process, if message be received, the state will end.

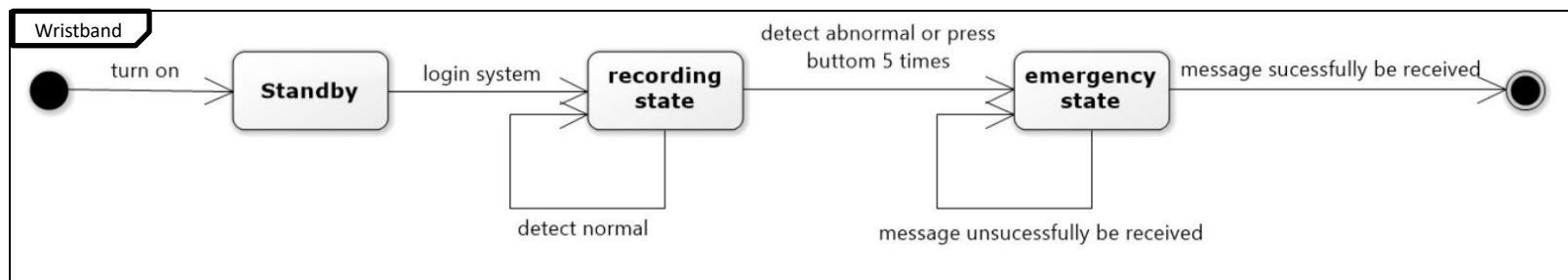


Figure 9 Behavior state machine - wristband

Participate In Assignments

ID	Name	Participate	Responsibility
B10423002	Leon	100%	use case diagram use case description activity diagram detailed sequence diagram class diagram behavior state machine check file
B10423003	Kurumi	100%	use case diagram use case description activity diagram Word & PPT check file
B10423009	Jerry	100%	use case diagram use case description activity diagram detailed sequence diagram class diagram behavior state machine
B10423015	Justin	100%	use case diagram use case description activity diagram detailed sequence diagram class diagram behavior state machine check file
B10423032	Kevin	100%	use case diagram use case description activity diagram detailed sequence diagram class diagram behavior state machine
B10423041	Dan	100%	use case diagram use case description activity diagram Word & PPT
B10423045	Rong	100%	use case diagram

			use case description activity diagram class diagram behavior state machine check file
W10423301	Ben	80%	check file
A10523050	Ian	0%	