1. Introduction:
2. description

The project is going to implement a gun game which contains 2 modes: Making different gun sounds and gun fighting against another user. The mode 1 is just emulate different gun sounds. And about mode 2, It is a round-based game and 2 users use 2 phones to run this game to have a gun fighting against each other. Also, every user can only take one action in each round, shoot or load a bullet or shield (initially there is no bullet in neither gun and the users need to use the load instruction in some round to load it and the bullet can be accumulated). The winning rule of the game is very simple: one user shoots the other while the other is loading bullet or either of the user can load 5 bullets totally to make a “super shoot”, which cannot be shielded.

1. Goal

Most of the related apps in the market can only provide several types of gun sounds tediously. Therefore, I will like to make this to be a most interesting game. My game not only provide the same types of gun sound but also provide an interesting way for 2 users to fight with each other.

(3) Problems

When I was doing the project, I encounter so many problems.

1.I do not have an smart phone which runs on Android operating system so it is difficult for me to do the test, but the emulator somehow help me a lot.

2.The sensor simulator reference parameter cannot be read from the simulator’s controller because there is pretty much deviation between the value loaded into the program and the read value from the controller. Besides, my app requires pretty accurate sensor feedback.

3.I want to realize the message deliver between two users, however, unfortunately I am not familiar with the communication technology so I cannot realize the Bluetooth connection setup and multiuser mode.

4. There are pretty much bugs exist in my app because I am just a noob for android programming and the time is not enough.

5.It is really difficult to test the program about Bluetooth because the available sample code can only support 4.0.3 API and it cannot be test on emulator.

1. Design and implementation

Mode 1: Single player mode

In this mode, user can choose one of the three guns to make simulate the corresponding gun shoot.

For this part, the difficulty is to design the sensor algorithm to let the sensor sense the phone shake properly and Algorithm is descripted below:

Phone shaking sensor algorithm:

1. I have a flag for identifying whether the sensor value not is for the beginning of the shake or the end of the shake and I set 1 for the end and 0 for the beginning and it is 0 at the beginning.
2. When the phone reach a beginning range(-5<pitch<5 && flag==0), get a starting value of pitch, which is the starting point of the shake) and set the flag to be 1 then begin to continuous get the pitch value.
3. If the difference between the later pitch value and the beginning pitch value is larger than some particular value, 30, then the sensor recognize the shake and make a gun shoot.

Mode 2: Multiple Player

Firstly, every 2 actions, which are made by the 2 users respectively in the same round, have to be finished simultaneously. This rule is going to be implemented by using a sensor to make sure that the time difference between the time when one user makes the action and the time the same user receives the other user’s action is less than some suitable value.

I am going to use Bluetooth to realize the message exchange between two users to determine who wins. The mechanism is simple. When user activate shoot, it sends “1” to the other phone, “2” for load and “3” for shield. The user will lose only when he is doing a reload action and receive a “1”. And after one users detects he loses, he will send the other user the message “win”.

Then let’s discuss how to implement these 3 actions by the users during the game:

1. Shoot: user just shakes the gun only once.
2. Load: right shake the phone
3. Shield: click the shield button on the screen.

Also, It is pretty hard to guarantee the mutual exclusiveness among this three actions especial between the two shaking action, shoot and reload.

Here I also use the previous flag to realize the mutual exclusiveness. The mechanism is just as long as the sensor detects a effective shake no matter up shaking or right shaking, it will automatically set the flag to be zero and do not sense the end point of the shaking anymore. Instead, it waits the sensor to be put back to the proper starting region and do another action.

The data calculation and screen update part is very simple, so service is not needed in this application.

The isn’t that much shared data between 2 different activities, so content provider is not needed.

Here is the block diagram of the activities in the application:

pistol

Shotgun

Mode 1(making different kinds of gun sounds)/activity

sniper

Game/application

Shoot/activity

Mode 2(2 users fighting)/activiy

load/activity

shield/activity

lose/activity

3.Testing and Evaluation

Mostly I just use the emulator the test my app and it is pretty ok with it. When I need to use the real phone to test it, there is some problem with API level but It is still quite easy to solve. However, when it comes to the testing for Bluetooth setup. It is almost impossible because the Bluetooth testing cannot be implement on the emulator and it can only be supported on 4.0.3 API and such a high level API is really rare in real cell phone.

4.Conclusion

I put pretty much expectation before I really do this project, however, I encountered so much problems when I actually start to do it. The problems are really hard to be solved like the problems related to sensor and Bluetooth.

5.Reference

Mostly from the lecture notes, like how to store the sound I am going to use and how the sensor performs.

The gun sounds is come from http://soundbible.com/tags-gun.html