Software Requirements Specification

CS684 Projects

Controlling FB5 using Android Phone over Bluetooth

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1 Introduction

An application will be developed on the Android phone which will sense the tilt and acceleration of the device and send this data over Bluetooth to FB5. Depending on the direction of the tilt the FB5 will move in the corresponding direction. FB5 currently does not have a Bluetooth support, so adding it will further enhance FB5 capabilities.

1.1 Definitions, Acronyms and Abbreviations

Controlling Console : Graphic User Interface built on Android phone

SDK : Software Development Kit

FB5 : Fire Bird 5

1.2 References

Android SDK : http://developer.android.com/sdk/
Bluetooth modules : http://bluetoothserialmodules.com/

2 Overall Description

Product Perspective :

A FB5 controlling application which controls FB5 wirelessly over Bluetooth. The controlling console is an Android based phone. This phone runs an application which according to the orientation of phone sends a corresponding signal which will control the motion of FB5 in different directions.

Product Functions :

- *Provide a User Interface for controlling FB5 on phone.*
- *Communication over Bluetooth to FB5.*
- *Receive signals over FB5 and interpret various commands.*
- *Sense user gestures (tilting of phone in different directions).*

Constraints :

- *Gestures that can be recognized are only tilt in 4 directions (in 1st version)*
- *Bluetooth 2.1 (no support for Bluetooth 3.0)*
- *Bluetooth range depending on module used*

Assumptions:

- *User aware with basic operation of mobile application*
- *Range is smaller than the supported range.*

Dependencies :

- *Android OS 2.1 compatible phone*
- *3 axis accelerometer*
- *Bluetooth Version 2.1*

Requirements Subsets:

- *FB5*
- *Bluetooth 2.1 module*
- *Android Phone with 3 axis accelerometer and Bluetooth 2.1*

3 Details

3.1 Functionality

- *Application on phone will give a controlling console for FB5.*
- *Tilting gestures in 4 directions will be sensed by this application and corresponding signals sent on Bluetooth to FB5.*
- *FB5 upon receiving commands over Bluetooth from controlling console, will move in appropriate direction.*

3.2 Supportability

- *Different classes will be implemented for each gesture, communication module (BT).*
- *FB5 code for Bluetooth will act as a different layer, which will act as a different layer, which provides standard operations like reading and writing as though it was a file.*
- *Modular coding and commenting of code will be done for maintainability and readability.*

3.3 Design Constraints

- *Memory requirement in Android phone for application development is limited.*
- *Bluetooth module cost should not make FB5 too costly as it would be used for educational purposes.*

3.4 On-line User Documentation and Help System Requirements

Help file in Android Application explaining "How to operate".

3.5 Interfaces

3.5.1 User Interfaces

We will be developing an user interface app on the mobile platform which can be accessed by user to use this application.

3.5.2 Hardware Interfaces

Bluetooth module will be interfaced with FB5 which will basically communicate with other Bluetooth module.

3.5.3 Software Interfaces

- *The application on the controlling console will interface with accelerometer and Bluetooth hardware via Android OS.*
- *Bluetooth layer will interact with software for serial port for basic Bluetooth transfer.*

3.5.4 Communications Interfaces

Bluetooth communication will be established between these two communicating modules (FB5 and Mobile phone).