CS223

Software Requirements Specification

PROJECT-2

Landslide simulation

GROUP 8

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1. Introduction

This SRS aims at developing a Android App which provides the user an immersive experience of landslide in Virtual Reality. The user will be able to experience the harsh phenomenon which take place at the time of landslide.

1.1 Purpose

We specify the software requirements and specifications for the mobile application named as "Landslide Simulator" in this SRS document. This document gives us a insight on the requirements for the app.This SRS gives us all the information about the software required to give the user such experience This app is being developed as a software project for the software engineering course of Indian Institute of Technology Guwahati under guidance of **Dr. Samit Bhattacharya.**

1.2 Document conventions:

The IEEE format was followed while creating this document.The font used is **'Cambria'**.The headings are written in **"bold**" and bullet points are used wherever required.

1.3 Definitions, Acronyms, and Abbreviations.

The basic and used keywords in this document is as follows:

- **SDK** : Software Development Kit
- **HMD** :Head mounted display
- **VR** : Virtual Reality
- **API** : Application Programming Interface
- **API level** : A measure of the version of Android device being used.
  API level 19 ~ Android 4.4 (Kitkat)

1.4 Product Scope

This app will be used to get a first hand experience of landslide using HMD(Head Mount Devices). The user will be able to move around whenever there is head movement at a certain angle.Special effects like sounds and vibrations can be experienced by using headphones .This app will be usable by all users who can operate an Android Application efficiently.

1.5 References

- IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.
- Roger S Pressman :Software Engineering: A practitioner's approach:6th edition , Mcgraw hill,1992
- Unity Documentation, www.unity3D.com /Manual
- www.Youtube.com : Unity Tutorials

2. Overall description:

2.1 Product Perspective

This is a self contained and independent project.The goal of this app is to provide an immersive experience of a landslide in virtual world.

2.2 Product Functions

Functions included in the final product will be as follows:

1.User view in virtual world
2.Special effects
3.Start menu
4.Movement
5.Virtual menu

2.3 User Characteristics

For a user to use this app they should have the following characteristics:

- Should use an Android device above the API level(4.4 KitKat)
- Should have Head mount device as it is vr app
- Should have a basic understanding of how to use a Head mount device
- Should be able to understand the English Language to understand the instructions
- For better experience headphones are also a requirement
- Should be able to understand the functioning and operation of the working of the app on a basic level.

2.4 Assumptions and Dependencies

Assumptions:

- OS used on the device :- Android 4.4 or higher / API level 19 or higher
- Device should have sufficient memory(around 100MB) for storing the app

Dependencies

- Google cardboard app

2.5 Apportioning of Requirements

We are implementing a feature where when we look at a particular object the sound associated with that object gets amplified with respect to the other sounds. We are also going to implement a virtual menu which will have restart option which will play the video again from the start and resume option which will continue the video. These are secondary features which may not be present in the first version of the design .These features won't affect the functionality of the application. They will just make it more user friendly.

3. External Interface Requirements

3.1 User Interfaces

There would be a user friendly interface .The software will be GUI accessible and will use the touch screen interface of the android device to communicate with the user.

- There would be a opening window which will have the start option,Instruction manual .
- The Instruction manual section gives the user instructions about app usage(about the movements in virtual world using HMD) and also the devices to be used for better experience.
- The main window displays the video in full screen.

3.2 Hardware Interfaces

- An Android phone with a screen size ranging from 4 to 6.5 inches(depending on the HMD available) and should also have basic necessities like TouchScreen.
- Head Mount Device and earphones are also recommended.

3.3 Software Interfaces

- An Android phone with API level 19 or Android 4.4(KitKat) or above

4.0 Functional requirements

4.1 Functions:

This section will describe in detail all the features in the previous section.

1.0 Head tracking:

Input: User rotates his head.
Output: User view in virtual world also changes accordingly.
Description: User can see in different orientations by rotating his head as he does in real world.

2.0 Special effects:

2.1 Sound:

2.1.1 Sound sources:

Input: Time at which simulation starts
Output: Sound is played through the user headphones.
Description: User needs to hear different sounds like birds, Chirping, river flowing,landslide e.t.c in the course of time.

2.1.2 Amplify sound:

***Input*:** user is looking at particular object.
***Output*:** Sound made by particular object he is oriented toward should amplify.
***Description*:** The sound made by object that user is looking at Should amplify and when he turns away from object it should fade away.

2.2 Vibrations:

Input: Time at which Landslide occurs
Output: The smartphone user is using in head mount device should vibrate
Description: At the time of landslide the user smartphone should vibrate giving him an immersive

Experience of Landslide.

2.3 Shaking view:

Input: Time at which Landslide occurs

Output: The view of the user in virtual world should shake a little bit to give him some immersive Experience.

Description: User view should shake slightly when the landslide occurs

3.0 Start menu:

3.1 Start:

Input: User selects the start button from menu

Output: Simulation should start

Description: Selecting this option from menu should start the simulation

3.2 Instruction manual:

Input: User selects the Instructions option from menu

Output: Instruction manual should be displayed

Description: Selecting this option from menu should open instruction manual

4.0 User movement in virtual world:

Input: User looks downwards in real world .

Output: User view moves forward at some constant speed

Description: User will be able to move in virtual world by looking down at an angle greater than some fixed value with horizontal in real world

5.0 Virtual menu:

Input: User selects the virtual menu

Output: A virtual menu is displayed across the screen

Description: User can select the options given among the virtual menu

5.1 Restart:

Input: User selects the restart option from virtual menu

Output: Simulation should start from first.

Description: User can restart simulation by selecting this option in pause menu

5.2 Resume:

Input: User selects the resume option from virtual menu

Output: Simulation should continue from where it had Stopped.

Description: user can exit from pause menu and resume the Simulation

5. Nonfunctional Requirements

This section will describe in detail all the non functional requirements in the previous section.

5.1 Reliability and Performance Requirements

The performance of the product shall depend on the hardware components of the client's device .App would run smoothly on high end phones. Presence of other apps in the background may slow down the app.

5.2 Contextual Enquiry

Contextual enquiry is a semi-structured interview method to obtain information about the context of use, where users are asked a set of standard questions and then observed and questioned while they work in their own environments.

In this project passive type of contextual inquiry is followed.

1.Interview

1.1 Question- Would you like to have movements in the virtual world using head movements or through the input button on the HMD device.

User1:Using head movements is preferable.
User2:Both are acceptable.

1.2 Question- Would you like the sound of an object to get amplified when you see in that particular direction.

User1:Yes,it would give a more immersive experience .
User2: No,I would like the sounds to be natural.

1.3 Question- Would you like to a have a restart option as an input?
User1: Yes, it would be quite easy to restart the video.

User2: Yes,it makes things easier.

5.3 Availability

This is available for all age groups. It can be used 24/7 without any need for internet connection.

5.4 Maintainability

Thereis no major maintainability criteria of the app as there is no database to handle once the app is launched. Any updates for the app can be downloaded from software patches available through the Google Play Store.As the coding will be done according to the coding standards of IEEE any developer can resolve the inconsistencies of the application.

5.5 Portability

The application and the software dependency requirements(Google Cardboard) will be easily installed in any Android device. They can be installed on an Android using the same method as any other Android App via the Android App Manager. The app can be shared between the android phones.

5.6 Other requirements

Basic knowledge about the android phones is required. Free space of around 100MB is also essential.