SOFTWARE REQUIREMENTS SPECIFICATION

for

INTERACTIVE MAJULI RIVER ISLAND VIRTUAL TOUR

Version 1.0
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Contents

Revision History

Sno.	Date	Reason For Changes	Version
1	5/2/23	Original	1.0

Introduction

2.1 Purpose

The purpose of the interactive virtual tour of Majuli river island project is to provide an immersive, multimedia-rich experience that showcases the ecological, cultural, and architectural heritage of the island. The purpose of this virtual tour is to give users an in-depth look at the Auniati, Kamalabari temples, and Jangraimukh tribal village, encompassing its location, ecology, daily activities, and significant events. The tour provides a comprehensive experience of premises of the mentioned landmarks and its daily rituals.

2.2 Document Conventions

Term	Definition
DESC	Description
IMP Location	Important but easily overlooked locations and locations with ambient sounds (e.g. river, birds chirping)
UNIMP Location	Locations other than IMP Locations
Input key(s)	Keyboard/Joystick/Emulator key(s)

2.3 Project Scope

The project is meant to reach a diverse audience with an interest in the cultural and architectural heritage of the Majuli river island, including tourists, students, researchers, cultural enthusiasts, and individuals seeking knowledge of the island's unique features and significance. The project provides a virtual experience, making it accessible to a wider audience, including those who cannot visit in person.

Overall Description

3.1 Product Perspective

This software is used for interactive virtual tour of the Majuli River Island that highlights the ecological and cultural heritage of the island. Multimedia such as audio voice overs, video, text descriptions and ambient noices are also projected on to the user for a much better visual tour of the island. The main responsibility of the proposed system is to provide an interactive virtual tour of the island that caters to a wide range of audiences, including those who are interested in the island's heritage and those who cannot physically visit the island.

3.2 Product Functions

The product uses eye-tracking sensors (Oculography sensor) and head motion sensors in the user's device to determine factors such as the position of the eyes relative to the VR headset and head movements, which allows the system to adjust the user's 3D view accordingly.

The application should allow the user to interact with the virtual tour, providing features such as listening to ambient noises when close to specific places (e.g. rivers, birds), obtaining multimedia information (such as videos, audio, and text descriptions) about crucial locations either upon request or automatically if it is important and easily overlooked, and controlling multimedia (e.g. skipping videos, disabling audio, closing pop-ups) for a tailored experience.

3.3 Design and Operating Constraints

The virtual tour must be compatible with different types of multimedia files, including images, audio, and video, to provide a rich user experience. The application should be designed to conserve power, as it could consume a significant amount of battery life on the user's device.

It should also have an efficient storage mechanism for all multimedia content, such as images, videos, audio files, and text descriptions. The system should also comply with data protection regulations and ethical considerations, such as respecting intellectual property rights.

Interface Issues

4.1 Usability Requirements

The interactive virtual tour of the Majuli river island should offer an engaging, multimedia-enhanced 3D-view experience that showcases the island's ecological, cultural, and architectural heritage.

The application should also enable the user to interact with the virtual tour, including features such as hearing ambient sounds when close to certain locations (e.g. rivers, birds), should give an option to access multimedia information (such as videos, audio and text descriptions) of specific locations. It should also have a function of automatically activating the multimedia if the location is proned to be overlooked and the location is of significant importance.

It should also have the ability to give user the control of multimedia (e.g. skipping videos, turning off audio, closing pop-ups) for a much better personalised experience. It should have the ability such that the user has location awareness and the ability to teleport such that users can navigate through the tour and explore different parts of the island. The virtual tour should also have an intuitive and user-friendly interface such that it is accessible to users of all ages and technical abilities.

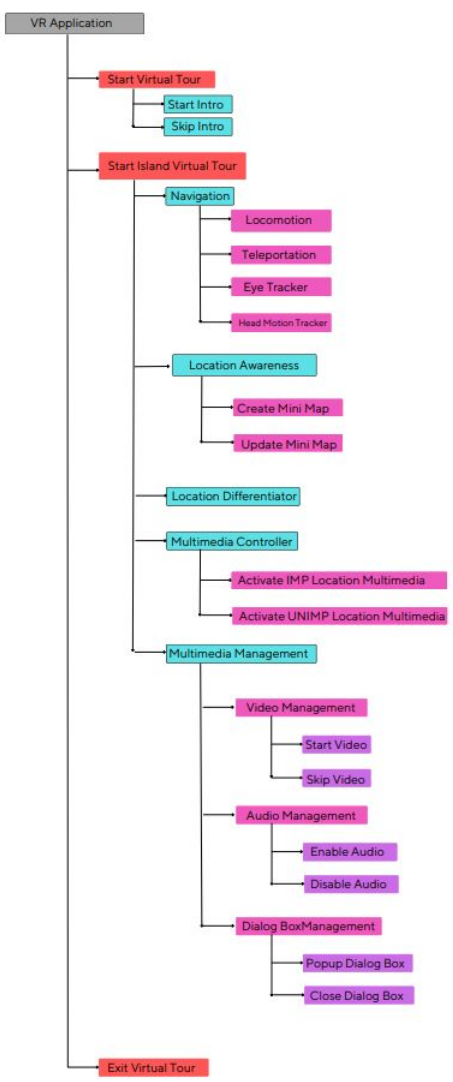
4.2 Hardware interfaces

In order to fully experience the virtual tour of the Majuli river island, it is important to ensure that the devices used have the minimum necessary hardware components such as devices with eye-tracking and head motion sensors, a computer or gaming system with sufficient processing power and graphics card. The hardware should also include speakers and input devices such as a keyboard or hand controllers. Additionally, it is recommended that the devices have a minimum screen resolution in order to enhance the overall experience of the tour.
It is also crucial that the devices have high performance capabilities, ample storage space, and operating system compatibility in order to effectively run the software.

4.3 Software interfaces

Software requirements may include a VR platform such as Oculus VR, Steam VR, or Google VR, a compatible operating system such as Windows, macOS, or Linux, and any necessary drivers or software to support the VR headset or device. The connection method between VR platform and the hand controllers may be Wifi, bluetooth or some wired connection. The virtual tour may require high bandwidth for optimal performance, which might pose a challenge for users with limited or slow internet connections.

Functional Requirements Hierarchy.



figureFunctional Hierarchy

Functional Requirements

6.1 Start Virtual Tour

- **Input** : Input key(s)
- **Output** : Visual Effects / Island Virtual Tour Start Screen
- **DESC** : Displays the visual effects or skips it based on the input keys

6.1.1 Start Intro

- **Input** : Input key(s)
- **Output** : Visual Effects and Geographical Description
- **DESC** : Displays visual effects such as globe rotation and gives a multimedial description (video/audio/image) on the location, geography, ecology, important places and daily life on the river island

6.1.2 Skip Intro

- **Input** : Input key(s)
- **Output** : Island Virtual Tour start screen
- **DESC** : Skips the introduction video and displays the start screen of Majuli Island virtual tour

6.2 Start Island Virtual Tour

- **Input** : Location Landmark (Kamalabari temple / Auniati temple / Jangraimukh tribal village)
- **Output** : VR Tour
- **DESC** : Starts the island's virtual tour based on the input location landmark

6.2.1 Navigation

- **Input** : Location/ Input key/ Sensor's data
- **Output** : 3D-view

6.2.1.1 Locomotion

- **Input** : Input key
- **Output** : 3D-view
- **DESC** : 3D-view based on stepwise movement (right/left/front/back) of the user

6.2.1.2 Teleportation

- **Input** : Location
- **Output** : 3D-view of teleported location

6.2.1.3 Eye Tracker

- **Input** : Eye tracker sensor's data
- **Output** : 3D-view of user's current field of view

6.2.1.4 Head Motion Tracker

- **Input** : Head Motion tracker sensor's data
- **Output** : 3D-view of user's current field of view

6.2.2 Location Awareness

- **Input** : Location Landmark / Location
- **Output** : Mini Map

6.2.2.1 Create Mini Map

- **Input** : Location Landmark
- **Output** : Mini Map
- **DESC** : Creates a mini map based on the chosen landmark

6.2.2.2 Update Mini Map

- **Input** : Location
- **Output** : Mini Map
- **DESC** : Updates the mini map based on real-time tracking of user's location

6.2.3 Location Differentiator

- **Input** : Location
- **Output** : Location Importance
- **DESC** : Decides whether a location is IMP or UNIMP

6.2.4 Multimedia Controller

- **Input** : Location
- **Output** : Multimedia / Choice Popup
- **DESC** : Automatically activates multimedia if the location is IMP, else gives user a choice for triggering multimedia

6.2.4.1 Activate IMP Location Multimedia

- **Input** : IMP Location
- **Output** : Multimedia
- **DESC** : Automatically activates the multimedia (audio/video/text description) of the location

6.2.4.2 Activate UNIMP Location Multimedia

- **Input** : UNIMP Location
- **Output** : Choice Popup
- **DESC** : Offers the option for the user to enable multimedia or not. If the user opts to activate it, then it will be played, otherwise, there will be no alteration

6.2.5 Multimedia Management

- **Input** : Multimedia Name
- **Output** : Multimedia/3D-view
- **DESC** : Multimedia is activated or deactivated appropriately based on user's action

6.2.5.1 Video Management

- **Input** : Video Name
- **Output** : Video/3D-view
- **DESC** : Video is played or skipped appropriately based on user's action

6.2.5.1.1 Start Video

- **Input** : Video Name
- **Output** : Video
- **DESC** : Plays the video description of that location

6.2.5.1.2 Skip Video

- **Input** : Video Name
- **Output** : 3D-view of that location
- **DESC** : Skips the video description of that location

6.2.5.2 Audio Management

- **Input** : Audio Name
- **Output** : Audio/3D-view/Silent Video
- **DESC** : Audio is enabled or disabled appropriately based on user's action

6.2.5.2.1 Enable Audio

- **Input** : Audio Name
- **Output** : Audio
- **DESC** : Enables the audio description of that location

6.2.5.2.2 Disable Audio

- **Input** : Audio Name
- **Output** : 3D-view/Silent Video
- **DESC** : Disables the audio description of that location

6.2.5.3 Dialog Box Management

- **Input** : Dialog Box Name
- **Output** : Dialog Box/3D-view
- **DESC** : Dialog Box is popped up or closed appropriately based on user's action

6.2.5.3.1 Popup Dialog Box

- **Input** : Dialog Box Name
- **Output** : Dialog Box
- **DESC** : Pops up a dialog box which contains the textual description of that location

6.2.5.3.2 Close Dialog Box

- **Input** : Dialog Box Name
- **Output** : 3D-view of that location
- **DESC** : Closes the corresponding dialog box of that location

6.3 Exit Virtual Tour

- **Input** : Input key(s)
- **Output** : Globe
- **DESC** : Exits the virtual tour to the start of the application i.e., to the "Start Virtual Tour"

Other Non-Functional Requirement

7.1 Performance Requirement

1. Fast load time for all multimedia elements
2. Real-time navigation with minimal lag
3. Responsive design for different screen sizes

7.2 Security Requirements

1. Secure storage and transfer of multimedia elements
2. Data protection for user information

7.3 Network Requirements

1. High-speed, stable internet connection may be necessary to ensure a smooth and seamless experience for the user.