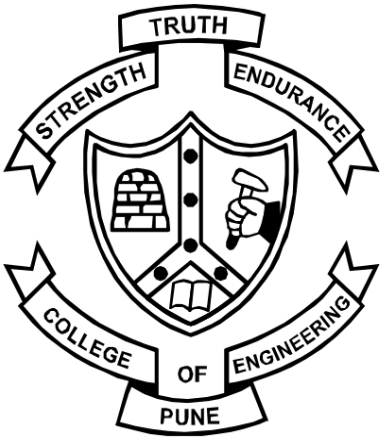
REPORT

ON

SPACE SHOOTING AUGMENTED REALITY GAME



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SYNOPSIS

Space Shooting Game by using

Augmented Reality

Problem Statement:

Developing a classic space shooting game where a user can shoot flying UFOs in Augmented space.

Abstract:

Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are "augmented" by computer-generated or extracted real-world sensory input such as sound, video, graphics, or GPS data. It is related to a more general concept called computer-mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. Augmented reality enhances one's current perception of reality.

Our aim is to create the space shooting game. It's a highly immersive, photorealistic, binaural, AUGMENTED REALITY survival shooting game for mobile devices. Gameplay takes place at home, office, open space wherever you want.

Problem with existing system:

Every industry has an evolution with the change of time, and gaming industry is not an exception to it. Virtual and Augmented Reality are the two technologies that are rapidly advancing. They have led the progress and rapid growth of many industries from gaming enhancements.

As VR implies the artificial simulation of real-life plot and surroundings, so when you engage yourself with a VR game, you feel a part of the gaming process. With the usage of special three-dimensional glasses, gaming consoles, gloves, one can experience VR at its best. Virtual Reality actually makes the gaming process more engaging and thrilling. Augmented Reality generally uses computer-generated objects, and tries to implement them into real-life situations. Through this process, the AR games become more interactive, as one can relate them to the computer-

generated characters. This makes the gaming experience of AR games more realistic than VR. Many business professionals and industry experts feel that AR is the far more profitable investment in the gaming world as compared to VR. Augmented Reality has the capacity to change the perception of the real world, and this perhaps makes it stand out from the crowd.

Augmented Reality, Virtual Reality, and Mixed Reality are very closely related terms in the tech world. Though they have most of the things in common, but the difference between AR and VR lies mostly in the purpose of their application. VR creates a computer-generated environment, whereas AR uses virtual elements like digital sensations, graphics and other such objects in a real-life environment, enhancing the way a user interacts with its own real world.

Another major difference between AR and VR lies in the way they are used. To experience VR one needs to wear VR headsets or 3D glasses, but in AR user experiences it through the app installed on their mobile or tablets. So it makes simpler for the user to experience AR. Also Augmented Reality (AR) games generally need a Virtual environment to be implemented as in Mixed Reality (MR), whereas Virtual Reality (VR) Games are in general self-sufficient with its own virtual world.

Language:

C#, JavaScript

Software requirements:

Unity 3D Game Engine, Android Studio.

Platform:

Operating System: Android or IOS

Physical Memory: 256 MB

Processor: Snapdragon or higher

Internal Free Space: 100 MB

Scope of Project:

The developed system can be modelled to handle more complex shooting process. We can also create the multiplayer games where multiple users can enter into an arena and play. We can also add the feature to play with online friends and those are connected with various social networking platforms such as Twitter and Facebook.

SOFTWARE REQUIREMENTS SPECIFICATION

1.0. Introduction

1.1. Purpose

The purpose of this document is to present a detailed description of the Space Shooting in Augmented Reality. It will contain information about the features and the user interface of the project and how the end user will benefit from it.

1.2. Scope of Project

Through project, an application on Android platform is going to be coded, in the name of the game to be produced. These application developed using augmented reality like Pokémon Go game. This game will entertain all the user. This game connects user with augmented reality world.

1.3. Definitions acronyms and abbreviations:

Term	Definition
AR	Augmented Reality
GUI	Graphical User Interface
API	Application Programming Interface
SDK	Software Development Kit
XML	Extensible Markup Language
IDE	Integrated Development Environment

1.4. References

1. Understand Augmented Reality: Concepts and Applications by Alan B. Craig.
2. Augmented Reality: An Emerging Technologies Guide to AR by Joseph Rampolla, Gregory Kipper.

1.5. Overview of Document

The rest of SRS examines the specifications of the Space Shooter Game in detail. Section 2 of the SRS presents the description about use cases, system environment, functional requirements and project constrains. Section 3 outlines the detailed,

specific functional, performance, system and other related requirements, system requirements of the Space Shooter Game.

2.0. Overall Description

This section includes the general description of Space Shooting game and context in which it will operate. Diagrams are provided to model the system context, features and related concepts.

2.1 Product perspective

This Every industry has an evolution with the change of time, and gaming industry is not an exception to it. Virtual and Augmented Reality are the two technologies that are rapidly advancing. They have led the progress and rapid growth of many industries from gaming enhancements.

Our aim is to create the space shooting game. It's a highly immersive, photorealistic, binaural, AUGMENTED REALITY survival shooting game for mobile devices. Gameplay takes place at home, office, and open space wherever you want.

2.2 Product Features

The Space Shooting game will have following features:

- Graphics
- Augmented Reality
- 3D Scenes in the Background.
- Multiplayer Environment.

2.3 User Classes and Characteristics

Expected users are anyone having Android mobile with a desire to play the games and more specially those interest in playing the games. Our game will require some general knowledge about handling of these game but will include a tutorials to make it accessible to most users easily.

2.4 Operating Environment

Our game will be developed using Android Studio and Android mobiles in C# and

JavaScript. Our game should be playable on any android mobile phone.

2.5 Design and Implementation Constraints

These game will be written in Java with the Android Studio for development and it also uses different libraries for graphics and user interface. We will design it so that the game will consume minimum memory so that it can run at a high speed.

2.6 User Documentation.

There will be option in game tutorial that the user can select to know the basics of the game mechanics in a safe area before begin the game. In addition to these there will be manual include with .apk file and a “help” option in the toolbar to assist the player which will explain the game specific mechanics.

2.7 Assumption and Dependencies

We assume that the user has the ability to install the apk file in android mobile and required basic knowledge about playing games. We assume that the user’s mobile have camera facility to provide augmented reality view in game.

Also assumed that the user understand English since all text contain in he can understand easily.

3. System Features

3.1 Touch Input

3.1.1 Description and Priority – Many touch on the screen will be utilized to control the interaction between the player and the game. This is extremely high priority.

3.1.2 Stimulus/Response Sequences – When the user touch on the screen the appropriate action will be performed (e.g. when we touch on the screen the gun will shoot the UFO). The basic information related to these will provided in game manual.

3.1.3 Functional Requirements –

- When the player touch on screen the game shall consistently carry out the appropriate action.
- The game shall provide the player with the opportunity to learn the action associated with game.

3.2 Camera Functionality

3.2.1 Description Priority

The camera functionality will have highest priority for the game.

3.2.2 Stimulus Response System

The camera feature will used when the game is started. These is used for displaying the augmented world of space.

3.2.3 Functional Requirements

The 3D world of space shall displayed on the mobile screen and UFO will around in it. The player will shoot UFO by touching on it.

4. External Interface Requirements

The game not uses any external interfaces. These game uses the built in facilities like camera, GPS, touch events.

5. Other Non-functional Requirements

5.1 Performance Requirements

5.1.1. Processing Power:

Requirement: Space shooting game will require a 20 MHz processor to run smoothly.
Justification: Space shooting game will not require much processing power.

5.1.2. In-game Load Times:

Requirement: Space Shooting game load time between levels will be near instantaneous
Justification: Space shooting game is graphically minimalistic so loading new levels will not be time consuming.

5.1.3. Launch Time:

Requirement: The time to reach the main menu upon launching the game will not exceed 10 seconds.
Justification: Since Space shooting game size is required to be small and launch time will be quick.

5.2 Safety Requirements

5.2.1 External System Integrity:

Requirement: The game will not be able to open, create, edit, or delete any non-game related files and will run in isolation to other unrelated processes that are operating concurrently.
Justification: This will help to prevent Space shooting game from causing any damage to the mobile phone or its internal components.

5.2.2 Save File Integrity:

Requirement: Upon a game crash, user's progress will be reverted to the earliest save prior the crash.
Justification: This will minimize the loss of user's data that occurs after a crash and the implementation of auto-saves additionally aid to minimize data loss.

5.3 Security Requirements

5.3.1 Preventing Save File Manipulation:

Requirement: Save files used in the game will be compressed so they become illegible to users.
Justification: To essentially create a black-box which prevents users or other parties from manipulating save files to prevent possible cheating.

5.4 Software Quality Attributes

5.4.1 Save Files

Attribute: The user will be able to load their previous save files.

Reasoning: This adds replay ability, as it allows the player to resume a previously played session, a feature that many players would prefer.
Attribute: The user will be able to save the game during any point of play.
Reasoning: Flexibility is added since Space shooting is allowing players to leave the game and come back to it at any time, which is something the player will be looking for.

REQUIREMENT ENGINEERING

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
1	**Introduction**							
1.1	Purpose The purpose of this document is to present a detailed description of the Space Shooting in Augmented Reality. It will contain information about the features and the user interface of the project and how the end user will benefit from it.	High		1	-	Started	-	1

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
1.2	Intended Audience and Reading Suggestions Expected users are anyone having Android mobile with a desire to play the games and more specially those interest in playing the games. Our game will require some general knowledge about handling of these game but will include a tutorials to make it accessible to most users easily.	High	-	-	-	-	-	1
2	**User Roles**							
2.1	Player: Player is the human entity whose plays the game.	High	-	-	-	-	-	1
3	**User Stories**							

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
3.1.1	Project Structure It helps to separate definition of project requirements, tests, and risks. It is dependent on the individual. Player should create the new as user in the game.	High	-	-	-	-	-	1
3.1.2	Object Attribute It helps us to store additional information in project documents.	High	-	-	-	-	-	1
3.1.3	Document Templates Ability to preserve consistency.	Medium	-	-	-	-	-	1
3.1.4	Project Templates This application helps us to relate with the existing system.	Medium	-	-	-	-	-	1

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
3.2	Requirements Definition This system has more of advantages like: ->This Game Will entertain all the user. ->This Game connectes user to Augmented world.	Medium	-	-	-	-	-	1
3.3	Intégration	High	-	-	-	-	-	1
	3.3.1 Import We can be able to import saved game file from other devices. 3.3.2 Export We can be able to export saved game to other devices.	High	-	-	-	-	-	1
4	**Contraints**							1

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
4.1	Startup Time Startup Time includes the time required for the application to get loaded on mobile phone.	Medium	-	-	-	-	-	1
4.2	Importing / Exporting Time Time required for Importing / Exporting saved game from other devices.	Low	-	-	-	-	-	1

ID	DESCRIPTION	PRIORITY	ASSIGNED TO	TARGET ITERATION	ESTIM-ATION OF SIZE	STATUS	DATE	VERSION
4.3	Security Application will be following zero bug strategy and will try to have no bugs at all this will help the user to feel more secure and also will not affect the database of the system.	High	-	-	-	-	-	1

LITERATURE SUMMARY

References used for this project are mentioned below:

Understand Augmented Reality:

Concepts and Application by Alan B. Craig.

Augmented Reality:

An emerging Technologies Guide to AR by Joseph Rampolla, Gregory kipper.

Using Unity 3D facilitate mobile augmented reality game development

Link: http://ieeexplore.ieee.org/document/6803110/

An augmented reality setup with an omnidirectional camera based on multiple object direction

Link: http://ieeexplore.ieee.org/document/5597181/