Purge – First Person Shooting (FPS) Game

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Abstract - In various researches it has been found that there is a correlation between playing first-person shooter video game and having enhanced mental tenacity. This is because while playing fps games the players need to react very rapidly to the fast-moving events and visuals taking place in the game. First Person Shooter is a genre which is usually 3D is very popular due to the variety of game types available. The most popular element of this genre is action or combat centered purpose. Other types of FPS games categories are role playing games, survival games etc. Role playing appeals to users because there is a purpose to serve or a storyline to follow. One of the most popular FPS games is a battle royale type one, in which multiple players battle it out on a map till there is only one remaining or a winning criterion is met by a player. The driving force behind such a large participation in FPS games is to prove that you are best player of them all. Hence, the game sessions can get very competitive and can also boost one's confidence or will to push himself/herself to accomplish the goals they set out to achieve.

Key Words: FPS(First Person Shooter), Game, Multiplayer.

1. INTRODUCTION

In First-person shooter the player experiences the action through the eyes of the in game character. The genre has similarity with other shooter games, which makes it fall under the heading action game.

They are unlike third-person shooter games in which the player is able to see the character they are controlling. The primary design element is combat, which mostly involves weapons like guns.

FPS games allow users to interact with the environment and also with other players. Players can play with anyone around the world and it gives them a unique experience because of the virtual world they can interact with.

Unity3D is a powerful cross-platform development tool and a user friendly development environment. The Unity editor runs on Windows and MAC OS.

It provides numerous tools and assets to the game developer which makes it easy to develop their game as importing tools is not necessary, also, the unity assets store provides excellent free game assets for the developer to use. Unity3D uses C# for scripting and building logic of the game.

2. RELATED WORK

In research done by[1] Jan Kruse, Ricardo Sosa, Andy M. Connor, they studied how urban environments can be developed and partially automated. From this we learned how to build terrain, buildings etc. for map designing. Increasing use of prefabs makes the map designing task effortless and also streamlined as all the assets come into one place to get used in the map.

In research done by[2] Christian Guttler, Troels Degn Johansson, they explore how a multiplayer fps game like Counter Strike was built and the idea behind the mechanics and working of the game. It is important to make levels with elements that depict real life objects or functions, which will allow players to interact more with the environment. Strategic points are also important while developing levels as it facilitates team play and strategy formation amongst players which makes the player feel more involved in the game. There should be a clear objective to play the game which will get the players to return to the game time after time.

## 3. TOOLS UTILIZED

3.1 Unity3D

Unity3D is powerful, developer friendly gaming engine which allows developer to develop very complex video games in very short time span[3][4]. Unity3D is cross-platform toll which supports game development for not only Desktop and mobile but for modern consoles like Playstation and Xbox.

Physics engine of Unity3D is a very powerful tool capable of simulating real world physics in virtual world very effectively.

Another advantage of Unity3D is its very effective terrain tools which allows developer to create terrain which helps in level design and environment development. Terrain tool also allows addition plants and trees to level to make it more realistic.

Unity3D also provides tools to create basic animations for player character. Another advantage of Unity3D is that developer can create interactive user interface very easily and very fast.

Unity3D uses C# for scripting purpose. C# is a general-purpose object oriented language.
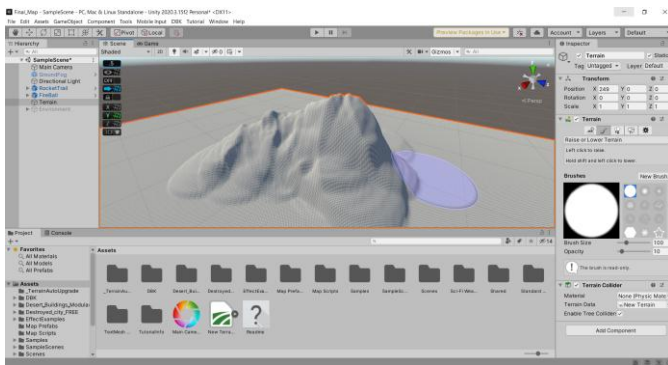
The above screenshot shows unity editor window with unity terrain tool.

3.2 Photon Multiplayer Engine

Photon is one of the most popular multiplayer gaming engine which is used by more than 6,00,000 studios around the world. Photon is a cross platform multiplayer game backend as Service. Photon provides support for multiple gaming engines including Unity gaming engine, Unreal gaming engine and Cocos2D gaming engine. Photon also provides documentation for the each of the mentioned engine to help the developer with development.

Photon has servers around the world to reduce the ping and improve the gaming experience of the players.

Photon provides function for services such as lobby creation, random matchmaking, matchmaking with friends and rank system.

For developer the photon provides analytics tab which allows developers to see data about games such as total number of hours that game is played and number of players from each region of the world.

Photon follows pay as you go model but for starters the photon also provides free service for 20 CCP (Concurrent Players)

3.3 Mixamo

Mixamo is a web-based service for three dimensional character animations. Mixamo uses advanced artificial intelligence and machine learning algorithm to create unique animations. For user created character Mixamo supports characters from Adobe Fuse CC or user can choose one from Mixamo library.
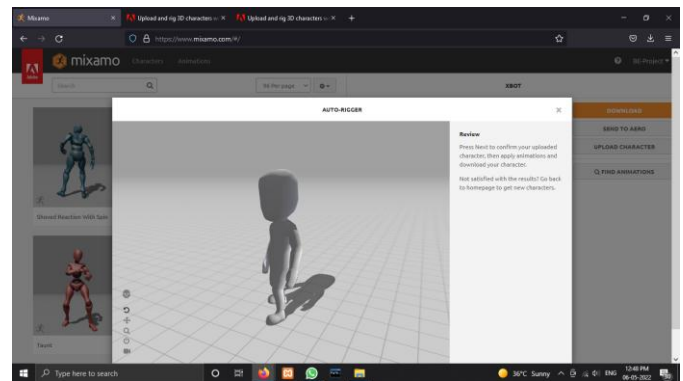

4. FLOW OF GAME

The first step in the flow of the game is to check whether there is a stable internet connection or not, if not, the game won't go ahead.

Next, the player has to enter his/her preferred username which will be used to denote the player while playing the game. After selecting username, a menu is displayed with options:- 1.Create room, 2.Find Room, 3.Quit Game.

The first option is when the player wants to create a custom room. Room name has to be entered and the map to be played has to be selected. Upon the creation of room the player will be in a lobby where he/she will wait for other players to join and eventually start the game.
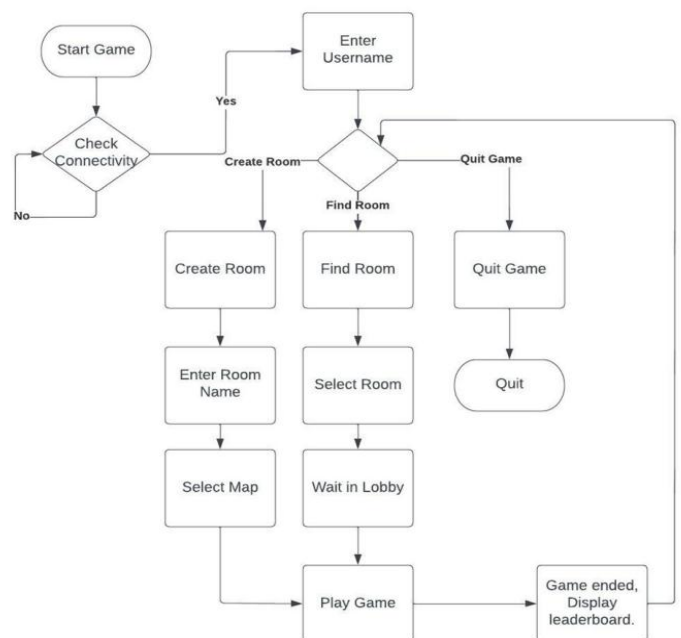
The second option is for when the player wants to join a pre made room, the player has to select from the list of room names displayed, after selecting a room, the player will go in the wating lobby until the game is started by the creator of the room.
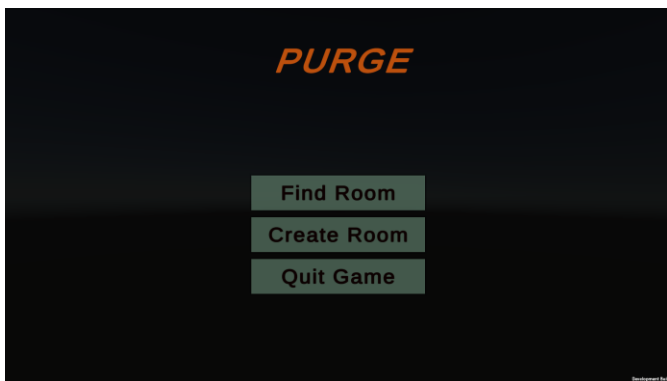
The third option is for when the player wants to quit the game.

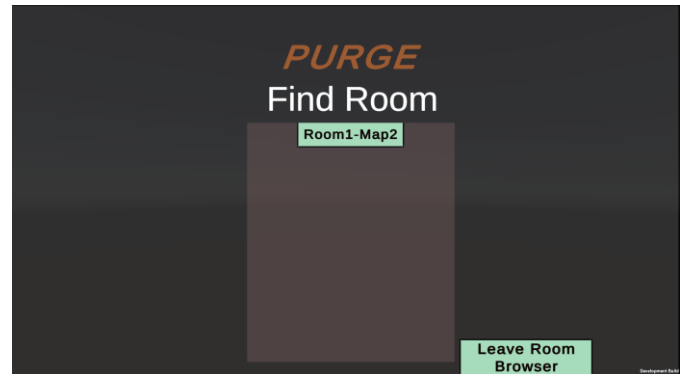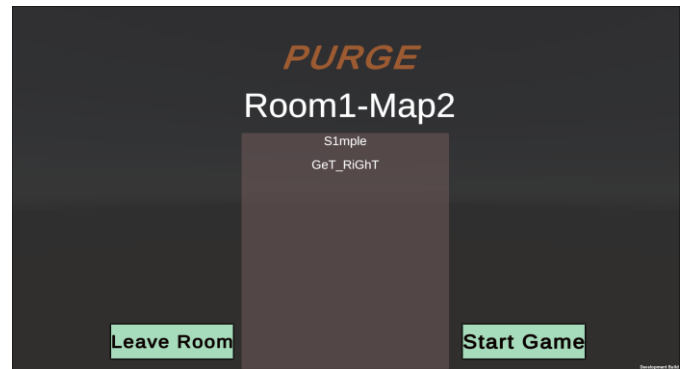## 5. GAMEPLAY SCREENSHOTS

5.1 Username

5.2 Main menu

5.3 Create room
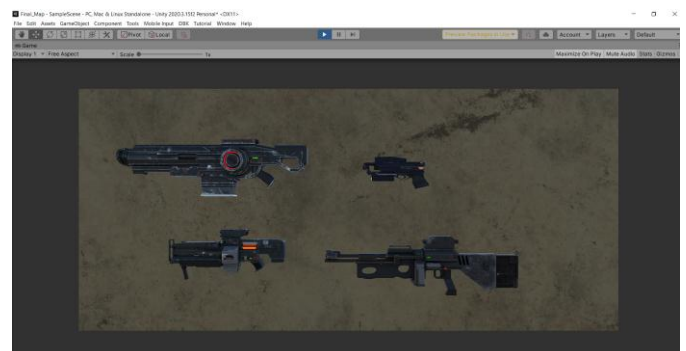

5.4 Find room

5.5 Lobby

5.6 Gameplay

5.7 Weapons

5.8 Leaderboard

This is the screen that is shown at the end of match with names of all players in the ascending order of their kills this screen will be shown for five seconds after the five seconds the player returns to main menu screen.

6. MAPS IN GAME

6.1 Map 1: Riverside

The map is inspired from a riverside military camp.

Establishments are on either side of the river and the two landforms are connected via a bridge. On one side there is a military camp and on the other there is a village.

There are multiple cover points like sandbags, tanks etc.

6.2 Map 2: Untitled

This is a maze type map small map which is inspired the untitled map in Counter Strike: Global Offensive and is specially designed for close and dynamic combat. It has several strategic points across it which allows players to gain advantage if the capture these points[2].
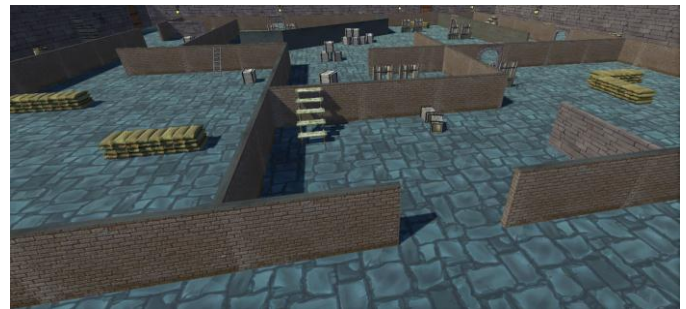
6.3 Map 3: City

This map is inspired from a war torn city. This map contains interior of apartments and houses to allow close quarter combat and open spaces to allow user to play using weapons like sniper. This maps also contains strategic choke points and sniper points which player can hold to gain strategic advantage[2]. This map uses unity particle pack to simulate the smoke and fire effects to make the player experience more immersive.
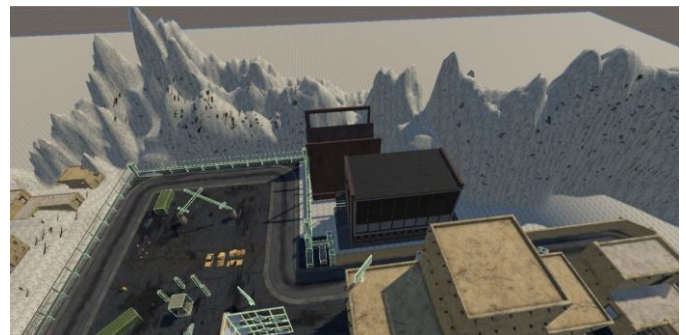
6.4 Map 4: Desert1.0

In map4 we have shown a virtual Desert environment. In this desert map we can see houses, rusted cars , sandbags , trees and many more object . We also shown sand flow effect in this map. Player has more chances to defeat with opponent and score more points.

7. ADDITIONAL DETAILS

7.1 Sound

The addition of sound to any games makes the entire gaming experience more enjoyable for player. According to a

research paper sound in video games not only gives message but also makes user experience more immersive[5].

This game contains sound for every action which can make sound in real world this ranges from obvious sounds found in any shooter games like firing of gun to sounds like enemy taking damage. All sounds for these game are taken from https://www.fesliyanstudios.com/ which proves royalty free music for all kinds of projects.

7.2 Weapons

This game has 3 weapons each with different fire rate, different amount of ammunition and different damage. Some weapons are automatic while others are semi automatic. Users can choose to reload cartridge at any moment.

7.3 Health and Respawning

Each player has hundred points of health after receiving damage from other player the health decreases and after the health reaches zero the player is respawned at one of predefined spawn points in the map

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