

ALPHA ARENA (GDD)

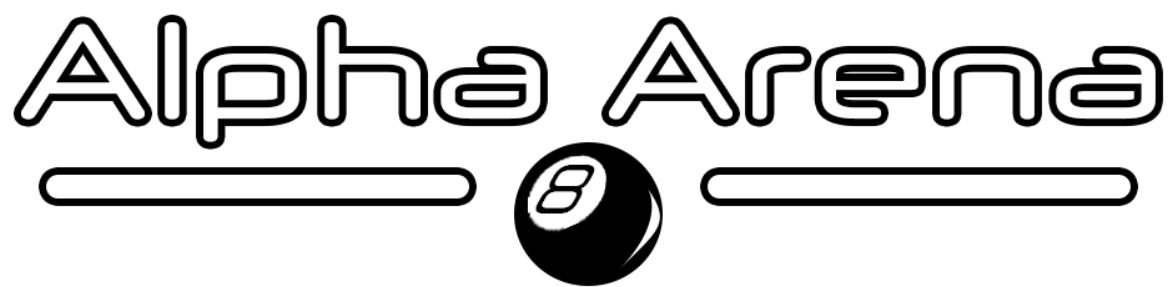


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Game Development Team Members

- PRODUCER
Team 8 Ball
- PRODUCTION MANAGER
Team 8 Ball
- PRODUCTION COORDINATOR
Team 8 Ball
- GAME DESIGNERS
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda
- SYSTEMS/IT COORDINATOR
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda
- PROGRAMMERS
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda
- TECHNICAL ARTISTS
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda
- AUDIO ENGINEERS
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda
- UX TESTERS
John Davey, Aldrin Basa,
Feng Lin, Roswell James
Castaneda

1 Game Overview

Title: ALPHA ARENA

Platform: PC Standalone

Genre: Arena FPS

Rating: (18+) ESRB

Target:

Challengers

FPS Players

Achievement Hunters

Release date: May 4, 2021

Publisher: Team 8 Ball

Description:

Alpha Arena is a multiplayer Arena FPS game where contestants are faced against each other in order to become the number one challenger in the arena. Challengers can pick up weapons such as pistols or rifles to use as tools to eliminate others in a deathmatch. At the same time challengers are able to receive buffs they can take back to the arena upon completion of quick training minigames such as an obstacle course and bird aim trainer.

2 High Concept

Upon creating a room, players can join the host to play Alpha Arena. The players in the room are given starting weapons, and can pick up new ones from weapon spawners. Players are also able to receive some buffs during gameplay by going to a buff machine and playing a mini game such as a boid aim trainer or obstacle course. The deathmatch has a time limit, and the person who kills the most opponents is the top player of the room.

3 Unique Selling Points

- Games within games! Alpha Arena gives a new take to the Arena FPS Genre.
- 2 Arenas! One Arena utilizes procedurally generated terrain.
- Multiplayer Network Capabilities. Utilizes the Photon Network utility to host and create games.

4 Platform Minimum Requirements

PC and MAC Stand Alone

OS: Windows 10

Processor: 2GHz Dual Core Processor

Memory: 8GB

Graphics: Direct X Compatible Card or other basic integrated graphics such as the Intel HD Integrated Graphics.

Disk Space: 150mb

5 Competitors / Similar Titles

- Apex Legends
- Quake
- Doom Eternal
- Call of Duty

6 Synopsis

You are a challenger of the Alpha Arena. Defeat your foes with the vast weaponry given to you! Be careful, as your foes come from across the nation, and everyone in the Arena is not as they seem. Ultimately, your goal is to become the champion of the arena!

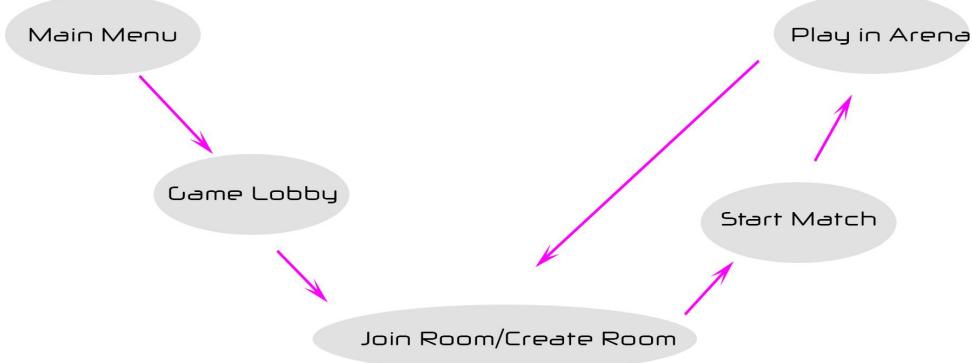
7 Game Objectives

- There is a time limit of 5 minutes for each match.
- The person with the most kills is the winner of the room!
- Aim to be the top player within the time limit.
- Eliminate your opponents.

8 Game Rules

- There is a time limit of 5 minutes for each match.
- The person with the most kills is the winner of the room.
- 3rd Party Software may not be used.
- Cheating in any form is not allowed.

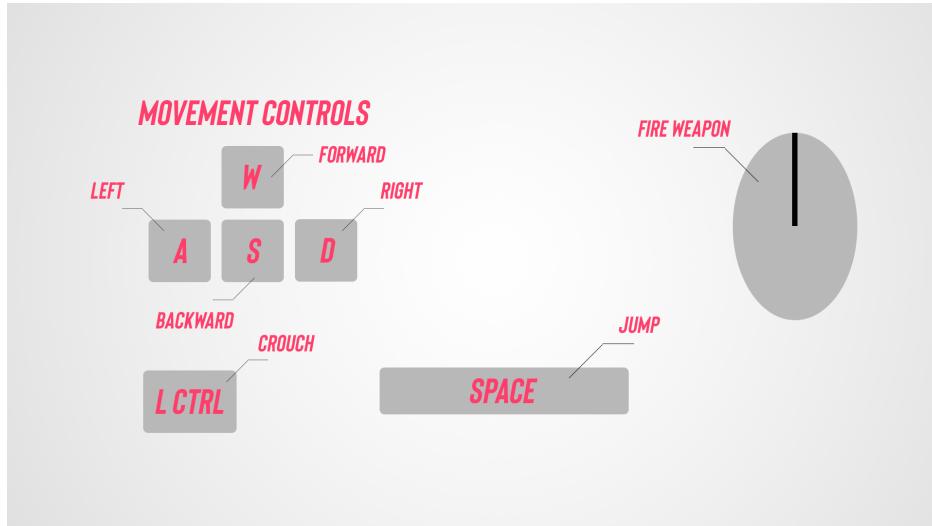
9 Game Structure



Alpha Arena has a looped gameplay structure. As the Player reaches the main menu, they have a choice to enter and connect to the game lobby. As soon as they do so, they then have a choice to host a room or to join an existing room. In this room, the host waits for other players to join in the room, then they choose a map, and then they have the option to start the game whenever they feel the room is full. Afterwards, the players in the room play in the Arena and duke it out for five minutes. As soon as the five minutes are finished, the players are then returned back into the lobby, where they can join another room or create another one to play again.

10 Game Play

10.1 Game Controls



The number keys or scroll wheel can be used to swap to different weapons.

10.2 Movement

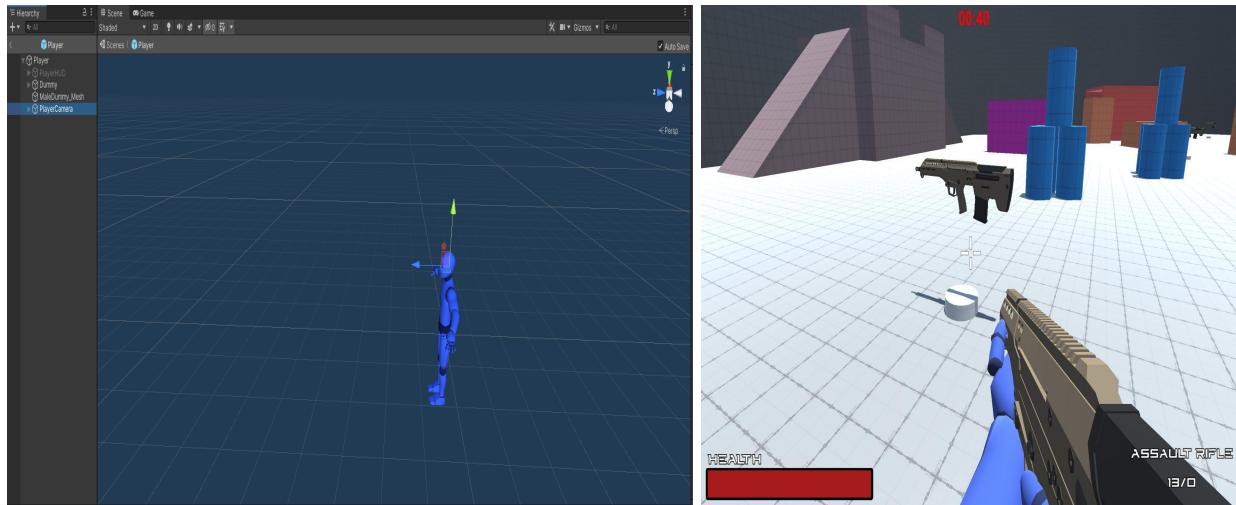
Alpha Arena movement system utilizes Unity's character controller with scripts that takes inspiration from Quake's movement system. This means every player has a velocity direction, and they are able to bunny hop to gain momentum to move around the map.



In order to perform the bunny hop, a player simply must keep pressing the spacebar to jump in a rhythm. However, in order for the player to increase their velocity as they bunny hop, they must move their mouse in the direction they are bunny hopping. In technical terms, as the player rhythmically presses the Space Bar and holds W to move forward, they must then move their mouse right as they do this as well as the D key as they move right.

10.3 Game Camera

10.3.1 Player Camera



Within the Player Prefab of Unity, we have a camera placed horizontally on top of the player's head. This makes it so that the view is from a first person perspective. In order to look around, we have a mouse look script which allows the camera to move around based on the mouse inputs. At the same time, the area where the camera looks also makes the player model face that direction.

10.3.2 UI

Main Menu UI



Upon loading up the game the player is met with the main menu screen. The main menu screen layout is basic. The player has the choice of starting the game to enter the network lobby, a basic how to play screen, and the ability to just quit the game.

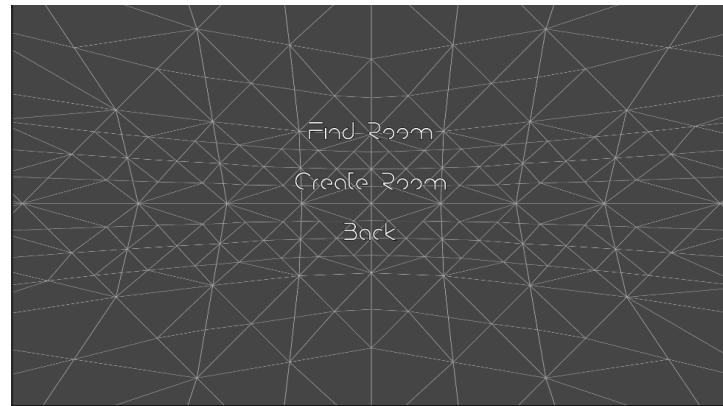
Launcher UI

Enter Name



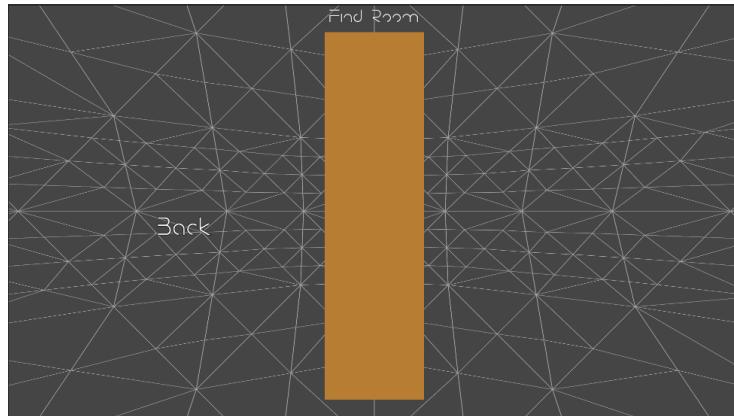
As soon as the player presses the start game button, a loading screen will pop up. After the loading screen, the player must enter their name into a text input bar, where the name will be used to indicate who you are to other players online.

Lobby Menu



After entering their name, the player is met with another basic menu layout. The player has the choice to find a room, create a room, or to go back to the main menu.

Find Room



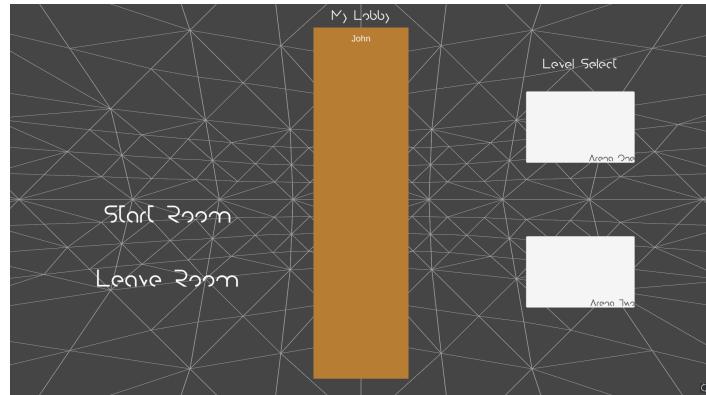
The find room UI is fairly basic, there is a bronze bar where button prefabs will show with the name of the rooms. Upon clicking these buttons, the player can then join into the room. The back button returns the player back to the lobby menu.

Create Room



When the player clicks on the create room button, they are greeted with an input text bar. The player must input the name of the room they want to create, and afterwards hit the create room button. The back button returns the player back to the lobby menu.

Room Menu



The room menu is similar to the find room menu, however, with a few more functionalities. At the top of the menu, the name of the room will be shown as inputted by the host. The host is able to select the level of the room, as well as the ability to start the game. Players who are not the host are unable to see these functions, however, they may leave the room from the leave room button.

In-Game HUD

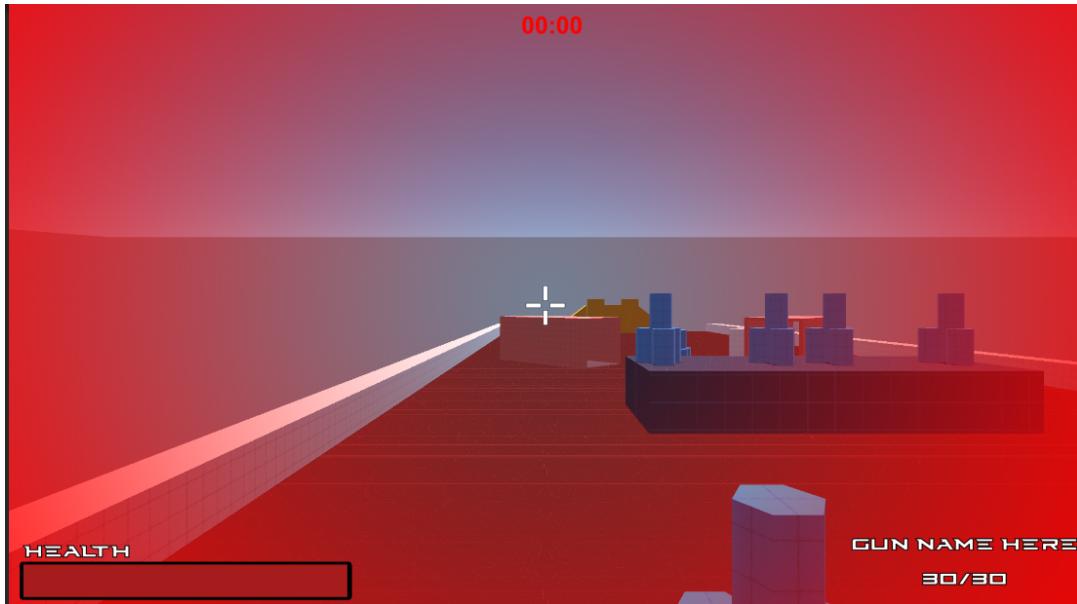
Alive View



As the player enters the game, they will see this first person HUD. On the bottom left is a red health bar. This indicates to the player the amount of health resource they have left. As the player takes damage, the amount of red fill will deplete in proportion to the damage they take. As soon as that health bar reaches zero, the player will go into a death state. On the bottom right is the Gun UI. The Gun UI will showcase the name of the currently held weapon as well as the amount of ammo in the clip (as indicated by the left number), and the reserve ammo (as indicated by the right number). In the middle of the screen is a crosshair. The player uses the

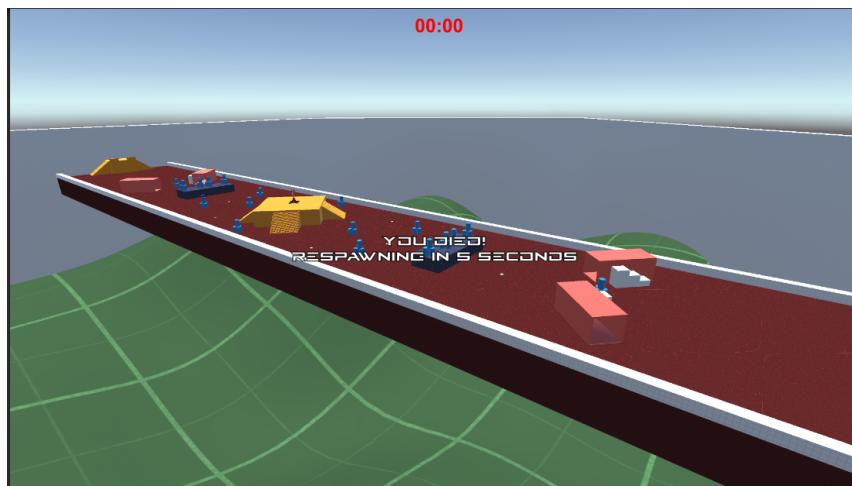
crosshair to help aim their gun. If the player is able to hit another player, a hitmarker will pop out indicating to the player that they have successfully hit their enemy.

Damage Received



Upon receiving damage by another player, the main player will receive a dark red gradient bordered on their screen. This helps to indicate to the player that they have received damage without having to look at the health bar.

Player Death



Upon reaching zero health, the player will be in the death state. Their camera will switch to the death camera which is just an overview of the map. Furthermore, they will be met with a death text stating they have died and will respawn in five seconds.

Player Mini Game



To enter a mini game, a player must move towards an Obelisk first. Upon entering the range of the Obelisk, the player will be met with some text UI to enter the minigame by pressing the E key.

Player Mini Game: Boid HUD



There is only one mini-game implemented at the moment, the boid bird hunt minigame. Upon entering this minigame, the player HUD will have more UI elements added on to it. On the top left, there will be a score counter and a time indicator. The numbers on the top of the time left indicator shows the player how many birds they have hunted (number to the left) and total

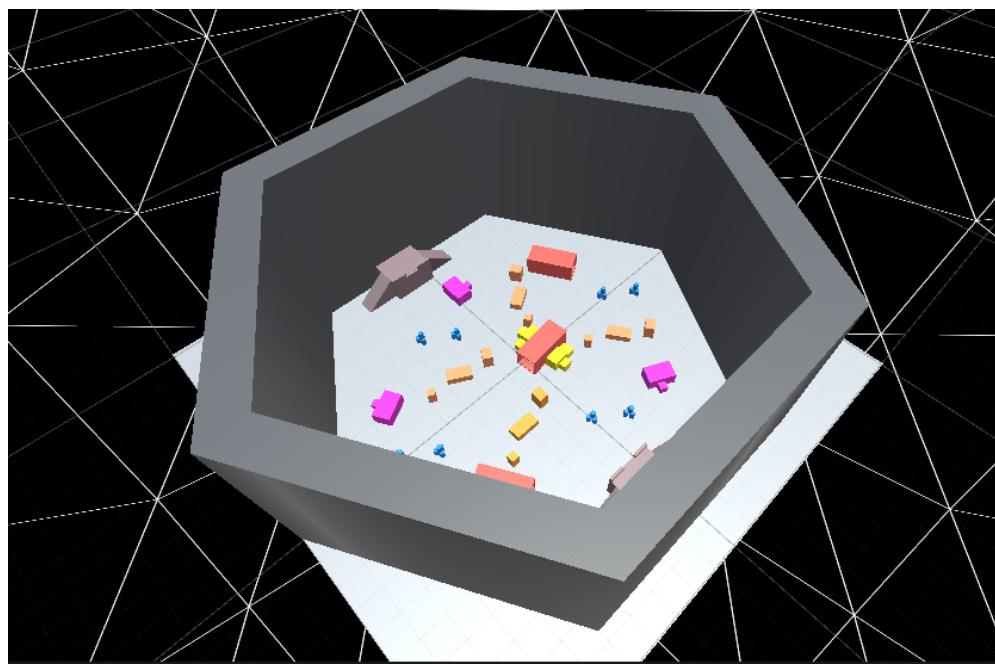
amount they have to hunt (number to the right.). The time left indicator just tells the player the remaining time left they have to complete the minigame.



As soon as the timer reaches zero, or the boid score reaches the max score. The player will respawn and will be given UI text to indicate they have either completed or failed the minigame.

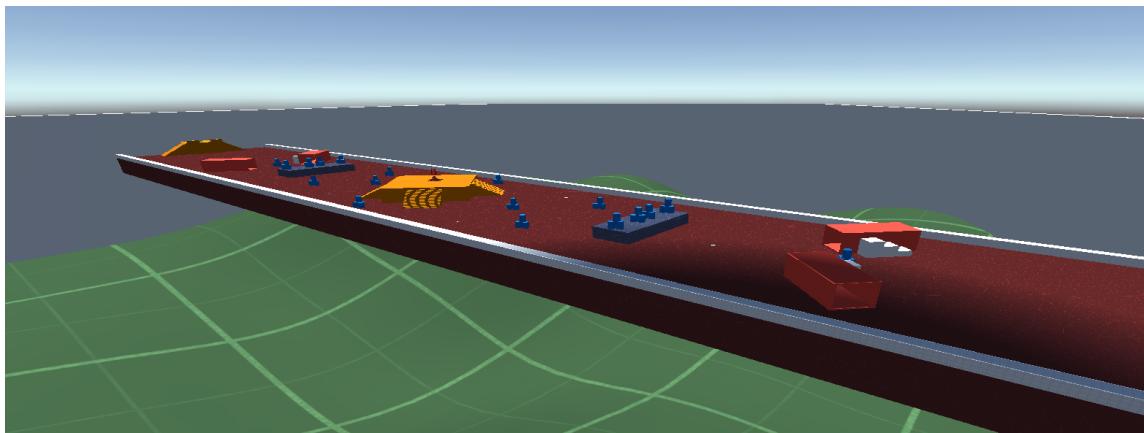
10.4 Maps

10.4.1 Arena One



Arena One is our basic implementation of an arena. This map is enclosed in an octagon to indicate to the player that they are bound to fight each other. Sniper Rifles can be found up the ramps at the edges of the map, while Assault Rifles can be found all around the map.

10.4.2 Arena Two

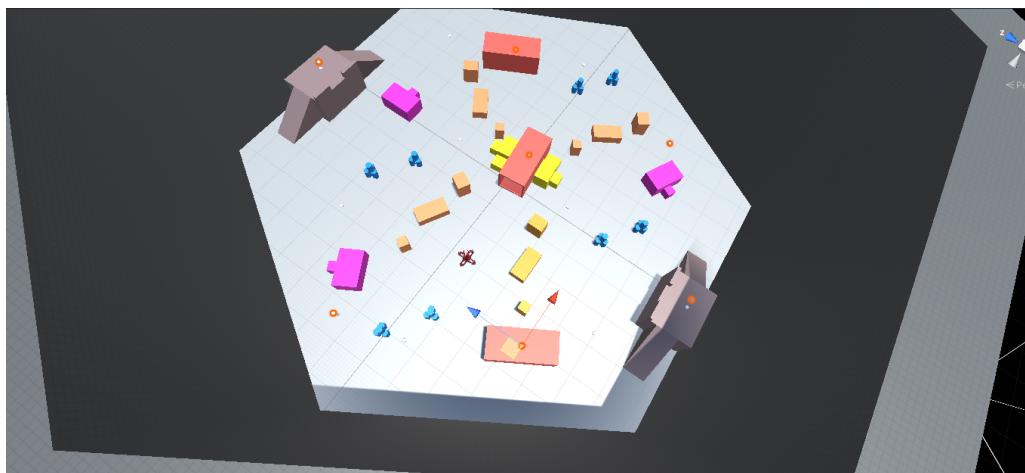


Arena Two takes place on a large bridge with procedurally generated terrain below it. Jumping onto the terrain below allows players to bounce off of it, letting them surprise opponents or relocate. Similar to Arena One, Assault Rifles can be found all around the map, while the ends of the bridge have Sniper Rifles.

10.5 Game Manager

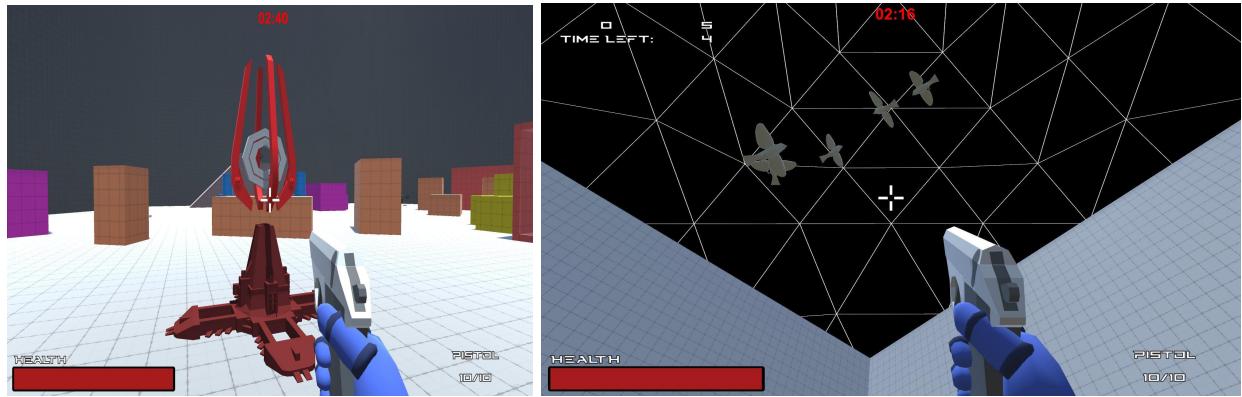
The game manager is a singleton object within our game. This handles all gameplay features, such as player spawning, player management, Mini game management, and network synchronization of these managers.

10.5.1 Spawn Manager



On each map, there is a group of invisible spawn points placed around. The spawn manager script takes all these spawn points and stores them in a list. The spawners themselves have scripts which have a delay timer and a ready or not ready state. When a player needs to respawn, the Spawn Manager grabs the position of one of the spawn points that is in the ready state, turns the chosen point into the not ready state, and sets the player's position to the position of the spawn point. Each spawner has a delay timer of 5 seconds to prevent another player from spawning from the same spawn point and back-stabbing another player who has just respawned.

10.5.2 Mini-Games



Mini game challenges are a mechanic that is implemented into the game. To enter a mini game, a player must go around and find a red obelisk looking model. Upon entering the range of the obelisk the player will be indicated to press E to enter the mini game challenge. Currently, there is only one mini game that could be played, the boid bird hunter mini game. In this mini game, the player must hunt all birds in the flock within ten seconds. The timer for this mini game is short in order to keep the action of the main game going, the FPS arena portion of the game. Upon completing the mini game, the player will respawn with a 50 health buff. The player will not be able to receive another buff until the Obelisk recharges again via a delay timer of 30 seconds.

10.5.3 Game Timer



Within the top of the player HUD, is a red timer. The Red timer indicates the amount of time left before the match ends. When the timer reaches zero, the room closes, then players are returned to the lobby menu where they can join another room and play again.

10.6 Other Mechanics

10.6.1 Weapon Pickups



Scattered around each map are small white plates on the ground. These plates are weapon spawners. By walking into the floating weapon, players can either pick up the weapon or pick up ammo for the weapon if it is already in their inventory. Once a player has picked up a weapon, it is unavailable for others to pick up until it respawns. Map designers can manually set the type of weapon and respawn time for each spawner. There are currently three weapons available as pickups: The Pistol, Assault Rifle, and Sniper Rifle.

11 Players

11.1 Metrics

Health: Health is the amount of life a player has. When a player's health reaches zero they turn into the death state.

Clip Ammo: Clip ammo is the amount of ammunition the player currently has with their current gun equipped.

Reserve Ammo: Reserve ammo is the amount of ammunition in inventory the player currently has with their current weapon equipped.

11.2 States

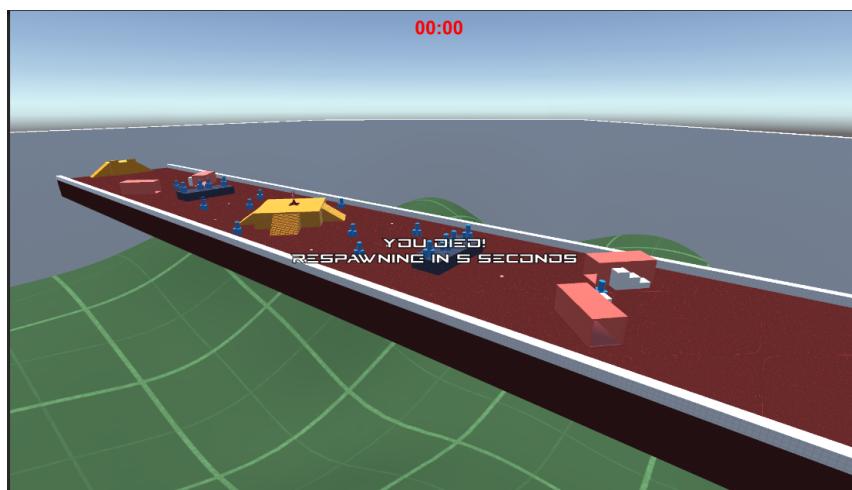
Idle

An idle animation loops while the player is not currently moving.

Move

While the player is moving, a running animation is played.

Dead



Upon reaching zero health, the player will be in a dead state. In this state, there will be a delay for respawning and a death screen with the time left to respawn. As mentioned, the player will respawn in five seconds, and will view the death camera for that time.

12 Networking



To handle all multiplayer related features and syncing, alpha one utilizes the free version of Photon Pun2 Networking. In order for the game to be multiplayer compatible with this API, all scripts of Alpha Arena must be of the MonoBehaviourPun or MonoBehaviourPunCallbacks inherited class. If any scripts will utilize data that must be sent to all players, these functions must be called using the PUNRPC definitions.

Furthermore, to design a multiplayer game, we had to change the way we think about development. A multiplayer game, in essence, is a single player game where things are synchronized together. This means that only one player camera must exist and only one player movement and look script must exist for each client. Every other thing such as model position, transform view, and animations are to be synced using the PUN2 Photon View, Transform View, and Animator View script APIs.

13 Art

13.1 Direction

Fonts and Logo Design



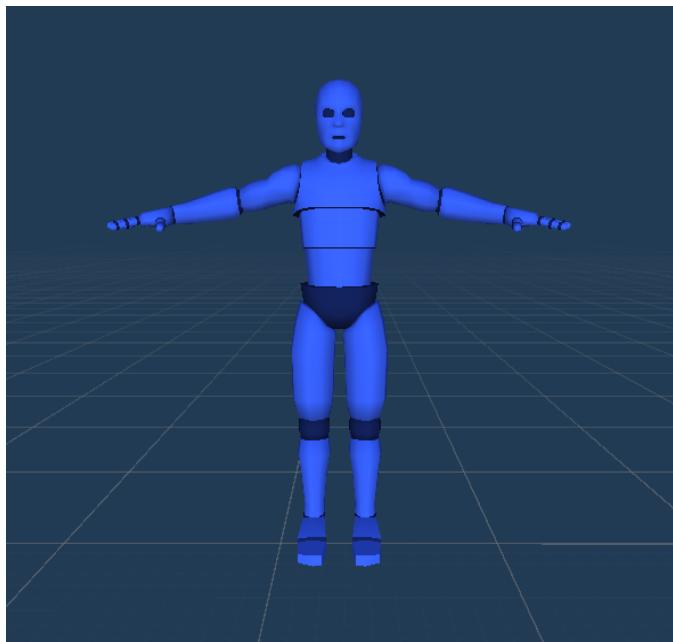
Overall, the direction our team wanted to go for when producing our game was a futuristic/modern look. In order to emit this feeling within our game, we chose to have modern looking Fonts. These fonts are very linear, minimal, and curve and break when needed to distinguish the text. These fonts add to the modern aesthetic where minimalism is key.

Furthermore, we incorporated this font style within our game logo. Again, we do this to add this modern aesthetic to the game and also to bring out that ambience when the product is on the shelves. We also incorporated our Team 8 Logo to let consumers know where the product is produced from.

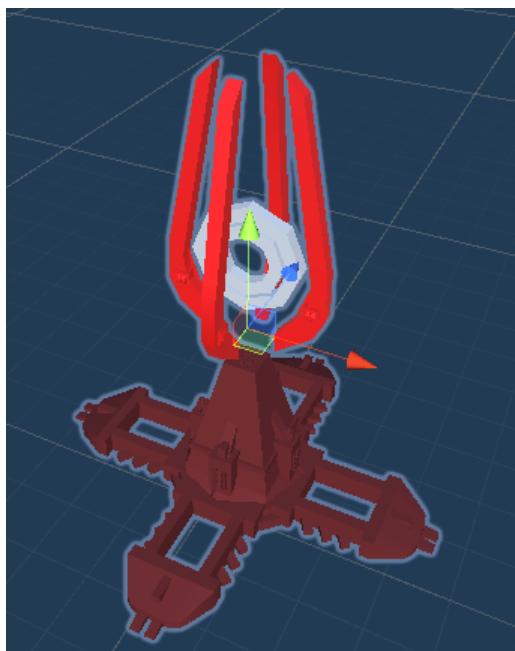
Models

With a direction going towards a modern aesthetic, our models needed to be the same also. This means our player model needs to look minimal, the weapons needed to look modern, and the maps needed to look modern also.

Player Model



Obelisk



Bird



Pistol



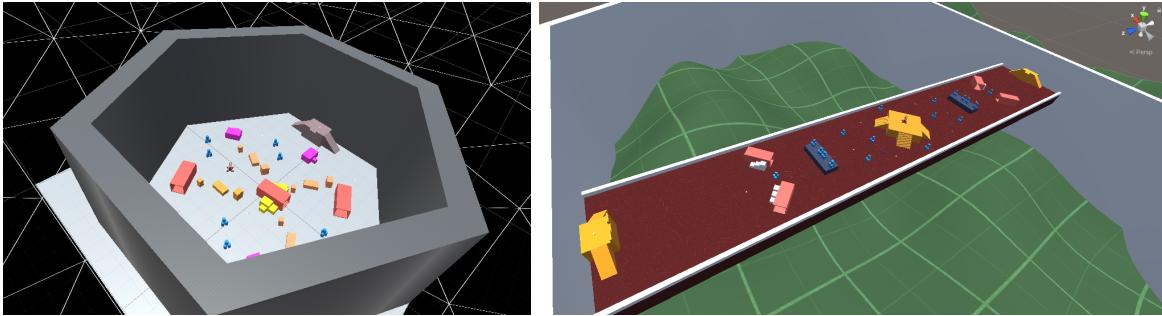
Assault Rifle



Sniper Rifle



13.2 Map Design



Being an arena style FPS game, players need to feel as if they are in an arena. To do this, Maps are enclosed within an hexagon. These hexagon walls are very tall, to make players feel like they can't escape and must do what they are forced to do, which is to fight other players. Within the maps are various obstacles in place, such as barrels and boxes for cover, and large freight containers for more cover, but a safer way to get around the map. Furthermore, there are ramps that lead up to a vantage point to let you see the entire map at the cost of not having too much cover. Furthermore, maps are made symmetric in order to feel balance and evenness.

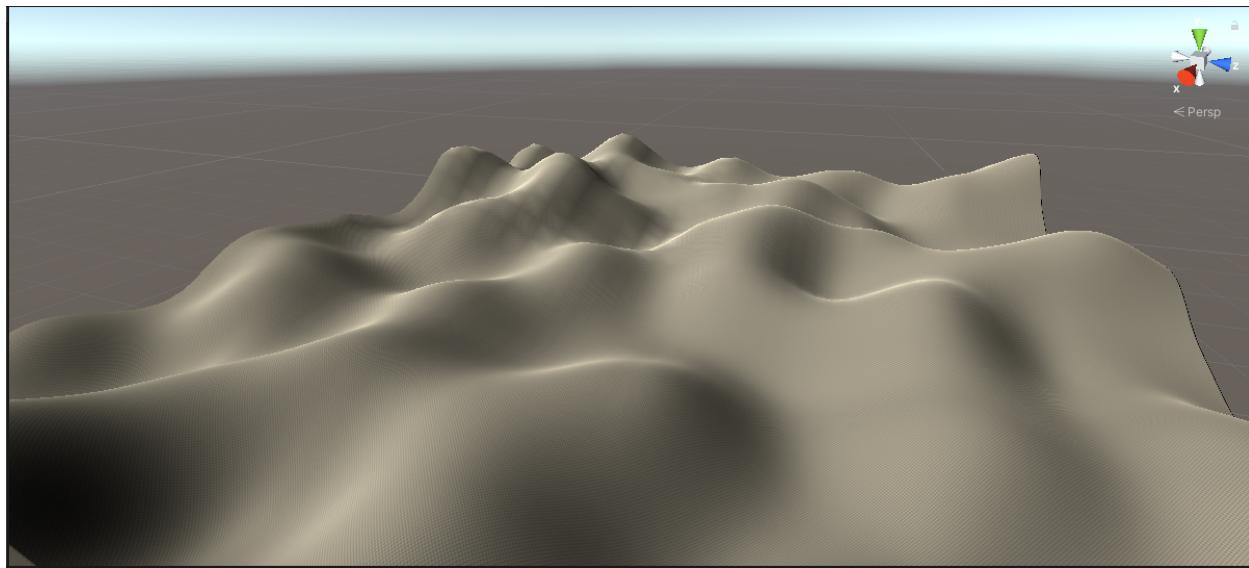
13.3 Audio

Name	Category	Description
Pistol_Fire	FX	Pistol firing sound.
AR_Fire	FX	Assault Rifle firing sound.
Sniper_Fire	FX	Sniper Rifle firing sound.
Pistol_Reload	FX	Reload sound for Pistol.
Pistol_Reload_Empty	FX	Empty reload sound for Pistol.
AR_Reload	FX	Reload sound for Assault Rifle.
AR_Reload_Empty	FX	Empty reload sound for Assault Rifle.
Sniper_Reload	FX	Reload sound for Sniper Rifle.
Sniper_Reload_Empty	FX	Empty reload sound for Sniper Rifle.

Weapon_Pickup	FX	Sound for grabbing a weapon pickup.
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14 Procedurally Generated Content

14.1 Terrain



In the second arena map of our game, we utilize procedurally generated terrain as a feature of the map. Utilizing Perlin Noise and the Unity Terrain Tool, we are able to make hilly terrain that looks very natural. In order to get this natural landscape with perlin noise, we mix different layers of noise (Octaves), set the frequency of the noises, set the amplitudes and persistence, and apply this noise to the height maps of the terrain.

14.2 Minimum Viable Product (MVP)

- Two Arenas
- Multiplayer Capabilities
- Player, Movement, and Shooting Mechanics
- Three weapons (Pistol, Assault Rifle, Sniper)
- One minigame: Boid hunter

15 Wish List

- **More Maps:** Adding more maps will increase the replay value of the game.
- **More Weapons:** More weapons will promote different playstyles.
- **More Minigames:** Example: having to dodge projectiles. Having more minigames to master keeps the gameplay fresh.

16 Bibliography

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FPS_Movement_RigidBody	DaniDevy	https://github.com/DaniDevy/FPS_Movement_Rigidbody
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Sniper_Rifle (Model)	TastyTony	https://sketchfab.com/3d-models/low-poly-cheytac-m200-5c9c318d77cc41a38323006b7aa07b1b
Assault_Rifle (Model)	TastyTony	https://sketchfab.com/3d-models/low-poly-dt-mdr-b728ea75fc54c628bd6cdce786a1e
Pistol (Model)	John Davey	Self-Made
pistol_df (Pistol Texture)	John Davey	Self-Made
hitmarker	John Davey	Self-Made

DamageGradient	John Davey	Self-Made
Sniper_Fire	Ben Jaszczak & Threetails	https://www.kickstarter.com/projects/bjjaszcz/the-firearm-sound-library https://freesound.org/people/Threetails/sounds/82459/
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AR_Fire	EFlexMusic	https://freesound.org/people/EFlexMusic/sounds/393671/
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Sniper_Reload_Empty	Ben Jaszczak	https://www.kickstarter.com/projects/bjjaszcz/the-firearm-sound-library
Pistol_Reload	Ben Jaszczak	https://www.kickstarter.com/projects/bjjaszcz/the-firearm-sound-library
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Weapon Shooting/Pickup/Inventory Scripts	John Davey	https://www.youtube.com/watch?v=zPZK7C5_BQo&list=PLhsVv9Uw1Wzjl8fEBjBQpTyXNZ6Yp1ZLw
Mini Game Manager Script	Roswell Castaneda	Self Made, Price
Alpha Arena Logo	Roswell Castaneda	Self Made
Crosshair HUD	Roswell Castaneda	Self Made
How To Play Image	Aldrin Basa	Self Made