Team 20

Design Document for:

Apex Havens

<u>Knock out the enemies! Win the war!</u>

"FPS: A world where gunshots are better than therapy."™

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Game Overview

Common Questions

What is the game?
 The game is named 'Apex Havens', it is an immersive and engaging first-person shooter set in an abandoned desert world filled with various challenges and enemies. The player avoids enemies to collecting coins and stops enemies from bomb explosions. The player needs to hide enemies and collect coins to win. The game doesn't have a storyline, it has objective based gameplay, thus making it fast paced. The game has different types of nonplaying characters, some of which will act as enemies and chase after the player, some of them will help the player by guiding in the gameplay. All the elements compliment each other and aim to provide the user a great gaming experience!

What is the target audience?
The target audience for this game is teens aged 10-16 years, who enjoy playing first-person shooting games and like to conquer challenges in an immersive world and storyline. The audience is school-going children, who have a busy lifestyle and whose life revolves around studies and new learning experiences every day as they discover the world. The game is short timed and has various levels which don't consume a lot of time. The short sessions along with challenging and immersive elements in the game can provide them with a quick break from schoolwork.

Why create this game?
Since the start, we have had a special place for FPS games because of their interactive and dynamic nature, we love the thrill and challenges that come with a FPS game and when done right, it can highly engage the player. Also, a FPS game can be molded and improvised to provide different yet immersive experiences with the same core skill which is shooting. Creating a FPS game allows us to translate our creative ideas into reality and come up with innovative objects and elements which also interest the player. Hence, this decision of creating a FPS game allowed us to express our creativity and add powerful yet unique game elements which will give the user a different and immersive feel while playing the game. FPS games give you the space to express your creativity and implement new ideas which could be totally new but immersive too.

Where does the game take place?
The game takes place in an abandoned desert environment with some small abandoned huts in it, the theme of the environment is a blend of urban and middle-eastern elements. The world consists of several houses and a big tower where the final resources and enemies are present. Some of the houses also have ladders and planks on their rooftops allowing player to go from one roof to another. You have to navigate around the world and take cover from enemies and reach the final building and complete the final challenge to win the game.

What do I control?

In this immersive FPS game, users will be able to control a skilled and complete FPS shooter with a gun. With accuracy and aesthetic abilities of the player, you will be able to walk, run, jump around the world to change your positions and hide, and run from the enemies based on the situation by using wasd. The player also holds a powerful gun by default, allowing players to blast enemies and take over! and have to communicate with civilians to collect all the coins.

What is the main focus?

The main focus for the game is that the player is given a mission to collect coins and kill enemies in the abandoned world. The player needs to collect all the magic coins and navigate himself safely to the main building, while also killing the necessary enemies to ensure survival. The main building has already some enemies in it, the enemies in the main building need to be killed and a final magic coin needs to be collected in order to win the game. In short, the player needs to collect the coins while also ensuring the enemies are killed. Collecting the final magic coin will make you win the game. You will then proceed to different further levels as this prototype slowly takes the form of a full-fledged game.

What's the difference?

There are many different FPS games like COD, Fallout 3, Fortnite with the core base of FPS theme.
The factors that make this game stand apart is:
- Challenge- The player has to fight different AI and prove that they have the skills, there are many enemies in the small world. The player has a challenge to survive, fight the enemies, while also collecting magic coins in order to complete the level.
- Quick Sessions – Keeping the target audience in mind, which comprises of school going teens in the age bracket 10-16, this game will provide various levels which can be completed in short amount of time, which is suitable for the target audience and also serves the purpose of providing them a quick escape from their responsibilities.
- Diverse NPC's – Not every NPC in this game is an enemy, that would be too boring. Each NPC has its own abilities and role in the game, some of the NPC are responsible for providing resources to the player whereas others give player some messages.

Feature Set

General Features

Confined Environment
Diverse NPC's (enemy and civilian)
Attractive Game World and Elements
Realistic Simulations – Soldier (player), Weapon (Gun), Reloading Animations (Gun)
Award System – Motivate Players to play further
Win and Lose Conditions.
Objective Based instead of story
Sound Effects
Fast Paced and Challenging

Gameplay

The game starts in a deserted and sunny environment where the player must collect a certain number of coins and survive from the enemies within a time-limit to win. When the game starts, the player has a gun and no clue if he or she wins. To win, the player must go to a chat bot NPCs which gives information to lead win, this element was added to make the gameplay challenging and engage the user experience. The game also consists of several NPC's (Non-Playing Characters) as civilians. In total, there are five NPCs:

- Old Guy NPC – When a Game starts the Player must seek the old guy and needs to know his task.
- Information NPC – Provides player information leads to final coin.
- Way Point Navigation Npcs – Civilian NPC's make traffic and make it harder for the player to collect coins in a short time.
- Attack NPC – Attack NPC equipped with bullets and able to attack and chase the player in certain distance.
- Best Search NPC – NPC that carries letters from one destination to another.

The player can jump, run and walk around the world to collect the coins and shoot the enemies. There is also a timer in the game under which it should be completed to win
the game; the timer element is also contributing to making the gameplay more challenging and immersive. Throughout the game, sound effects have also been added to enhance realism and engagement.

Flowcharts
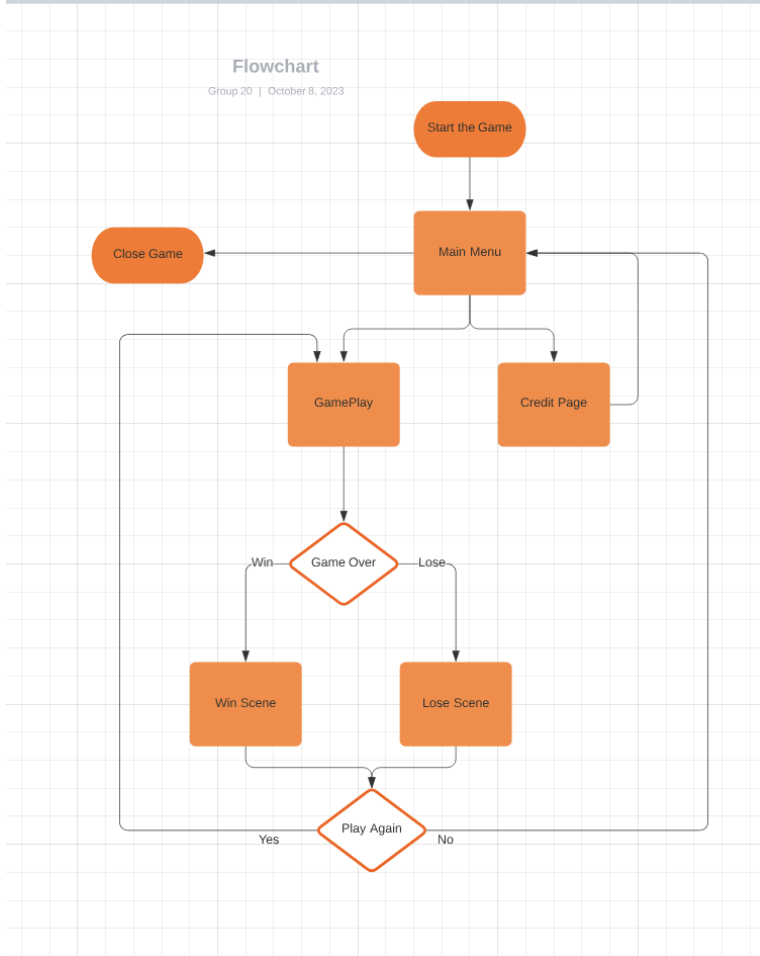
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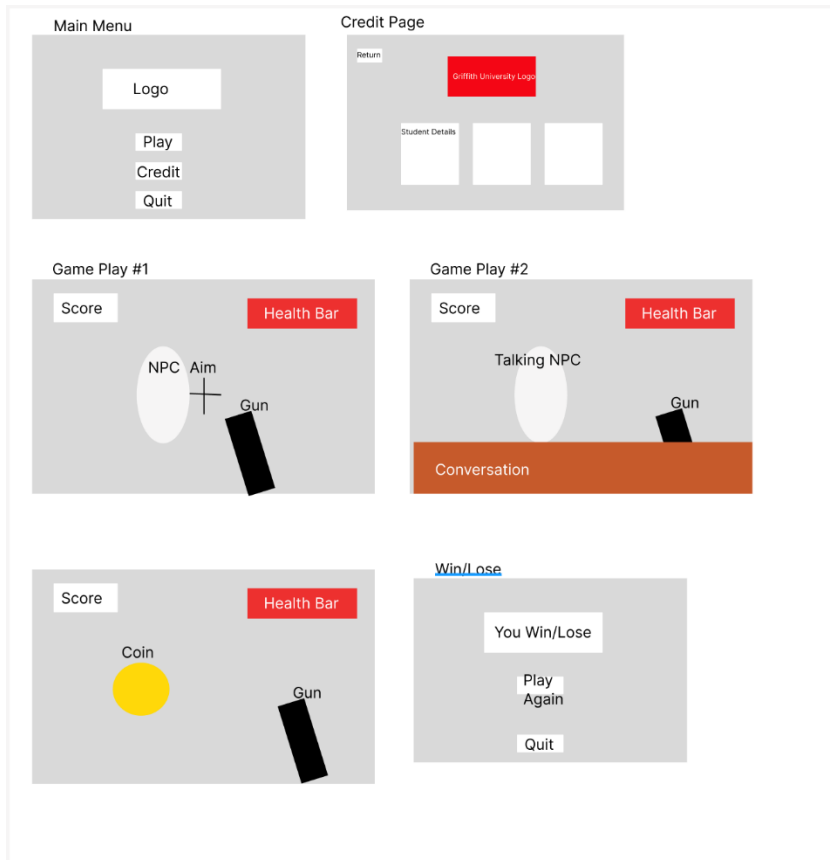
Controls

Controls	Action
W	Move Forward
A	Move Left
S	Move Backwards
D	Move Right
Spacebar	Jump
R	Reload gun
Left Mouse-Click	Fire Gun
L-Shift Key	Sprint
F	Communicate NPC's

Single-Player Game

Overview

In this game, the player finds himself chased by relentless NPC enemies and has to navigate through various challenging obstacles. The player's goal is to collect coins throughout the game world while avoiding and defeating the enemy NPCs. What sets this game apart is the unique feature that allows players to engage in conversations with the civilian NPCs, adding an extra layer of immersion and strategy to gameplay while collecting valuable coins.

Single Player Game Detail #1
Name: Johnny Cage
Age: 22
Goal: To save his village from terrorists.
Skills:
- Runs exceptionally fast.
- Proficient shooter.
- Impressive jumping ability.

Weapon: Equipped with a gun containing 30 rounds of bullets.

Story

In a Middle Eastern setting, our story unfolds as a small village falls under the control of terrorists, and chaos looms with an impending explosion threat. The main character embarks on a mission to rescue the village by collecting all the valuable coins scattered throughout. Along the way, aggressive enemy NPCs relentlessly pursue the protagonist, posing a significant threat. To add complexity, civilian NPCs, intentionally obstructing the player's path, make coin collection challenging. Additionally, chatbot NPCs offer vital game details and guidance to aid the player in their heroic quest.

Hours of Gameplay

The game's outcome depends on the player's skill, as they must collect all the coins within a set time frame to win. Losing can happen if the player complains during the game or loses all their health by getting shot before the time runs out. The time limit for completing the game varies based on the chosen difficulty level, with a default time of five minutes.

Victory Conditions

The player wins the single-player game by successfully collecting all the coins within the specified time limit without complaining or losing all their health due to enemy attacks. The game's objective is to gather all the coins while avoiding or defeating pursuing NPCs and managing your health effectively.
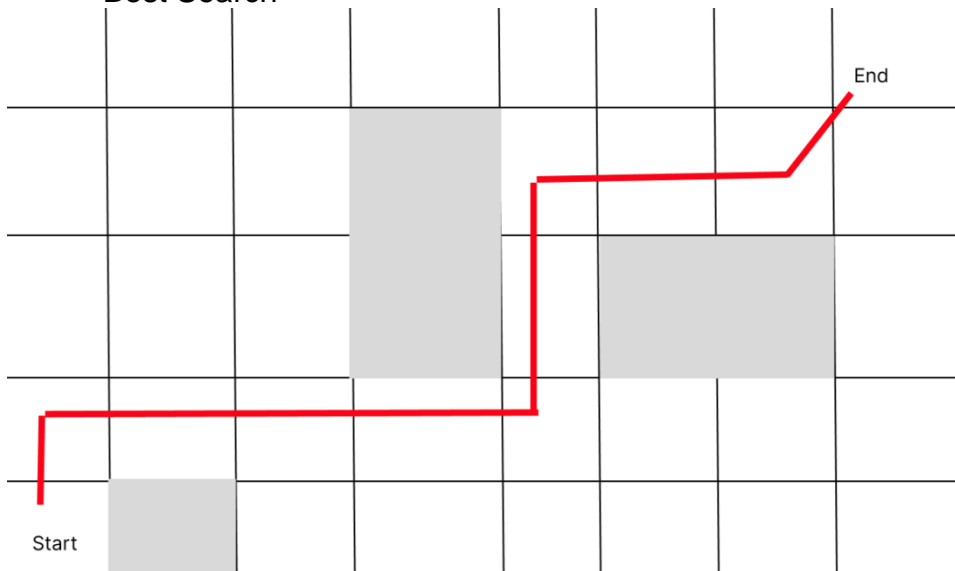
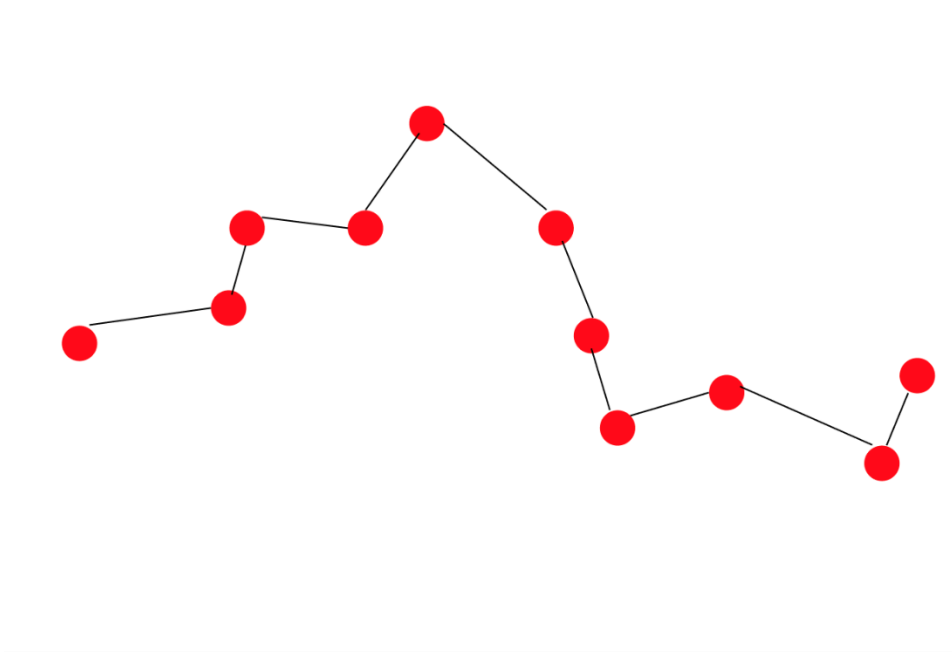## Artificial Intelligence

AI Algorithms

- Best Search
- WayPoint Navigation Algorith

AI Diagrams

- Best Search

- WayPoint Navigation Algorith

The Game World

Overview

The game unfolds in a desert village in the Middle East. The village has small buildings where players can jump around, and there's a tall tower hiding the last coin, making it a tricky challenge. Surrounding areas have windows that allow players to shoot at enemies safely. It's an exciting, action-packed setting where players need to be agile and smart to succeed.

World Feature #1

Tower: A really tall building that hides the most important coin in the game.
Small Buildings: These are little houses where players can hide from the bad guys and pick up coins.
Walls: These are like protective walls that keep the bad guys' bullets away from the player and give them a chance to shoot back.

World Feature #2

Boxes: You can use boxes to enter buildings and find shelter or resources.
Coins: Collecting coins is essential to winning the game; they are a key objective.

The Physical World
Overview

The game unfolds in a captivating desert setting, a sandy world filled with mysteries to uncover. It's like solving a big puzzle to secure victory. As players explore, they'll discover various objects and challenges that add excitement to the game. In this war-themed game, players face terrorists in an engaging battle.

Key Locations

Tower: The really tall tower has the last coin you need to win. You've got to reach the top to get it.
Top of the Building: When you climb up on buildings, it helps you stay away from bad guys and find hidden coins. It's like having a secret advantage.
Starting Point: The game begins when you talk to an old man. It's super important for winning and moving forward.
Behind the Tower: Go behind the tower, and you can talk to a guard who will tell you how to find the last coin.

Travel

The player has the freedom to move in all directions within the game's boundaries. They can also perform jumps onto boxes and buildings and even enter the tower. But they cannot access the inside of the small buildings.

Scale

In our game, we used a 3D scale to define the world's dimensions and the sizes of objects within it. This 3D scale is a critical aspect of our game design, as it determines how objects appear in relation to one another and helps create a realistic and immersive game environment.

Objects

- **Collectibles:** These are coins that players must gather to earn points.
- **Obstacles:** We've implemented the WayPoint Navigation Algorithm using small green beans which also reduces the player's speed.
- **Structures:** Buildings, towers, walls and boxes
- **Weapons and Items:** Guns and bullet for main player and npc's
- **NPCs (Non-Player Characters):** These are characters controlled by the game's AI, including chat bots, enemies, and neutral characters like the old man and guard mentioned in previous descriptions.

- **Decorative Elements:** Objects like ladder, coach, plant and decorative items that enhance the visual of the game world.
- **Interactive Elements:** Buttons to switch scenes.
- **Sound Sources:** Sounds for player's shooting action.

Camera

Overview

The game's camera system offers two distinct views: the player's first-person perspective and a 2D view to the in-game menus presented on the canvas.

Camera Detail #1

The camera implemented in main character, ensuring that it follows the action smoothly and captures point of view to keep players engaged.

Camera Detail #2

In some circumstances, the camera will have a 2D view. It allows players to view menu credit page and pause from game.

Game Engine

Overview

We are utilizing Unity version 2022.3.4f and university-provided templates to develop AI navigation and search algorithms for NPCs in our game. Unity's Ai Navigation and other features make it an ideal platform for creating immersive AI experiences that enhance gameplay and challenge players within our project.

Game Engine Detail #1

Collision Detection
In our game engine, collision detection is meticulously implemented to ensure that all objects interact realistically with one another. NPCs and players navigate the game world, walking on the ground and buildings without passing through them, enhancing immersion. Moreover, we use collision detection for bullet interactions, enabling projectiles to accurately hit and interact with objects, creating dynamic and engaging gameplay experiences.

The World Layout

Overview

The world layout creates our game environment. It has things like buildings and towers, walls that stop you from walking through, and NPCs (characters) around.

World Layout Detail #1
The world design involves creating an environment enclosed by walls, featuring a combination of elements such as buildings, towers, walls, and NPCs. These elements contribute to the overall structure and challenges within the game.

Game Characters
Overview

- Main Character – Soldier with Gun
- Chat bot NPC #1 – Old Man
- Attack Bot
- Chat Bot #2 – Tower guard
- Delivery Bot
- Civilian Bot

Creating a Character

Main Character - We've enhanced our main character by equipping them with a realistic-looking gun. Moreover, we've adjusted the character's height dynamically based on the game environment. To further improvement, we've implemented walking and running sound effects for our character, creating a more lifelike and engaging gaming experience.
Old man (chat bot)- We've introduced a friendly, old folk to guide our main player, providing valuable information through interactive conversations. This wise old man shares essential tips on how to achieve victory within the game. He encourages the players' spirits by expressing his loud laughter.
For other NPCs, we've opted for a simple yet distinctive design, using cylindrical shapes as their body structure.
- **Red NPCs:** These represent civilians
- **White NPCs:** These serve as tower guards
- **Yellow NPCs:** These are designated for delivery tasks

Enemies and Monsters
Attack NPC - We've introduced small NPCs that resemble soldiers, featuring red arms and green bodies for easy identification. Attack NPC attack the player by firing gray bullets and chasing him in close distance.

User Interface

Overview

The user interface (UI) is a critical component of our game, providing players with essential information, controls, and feedback. It improves the overall quality of gaming experience and helps players navigate the game world effectively.

User Interface Detail #1
The UI includes components such as health bars, ammo counters and score boards offering players real-time information about their character's status and surroundings. These elements are strategically placed on the screen for quick reference during gameplay.

User Interface Detail #2
In addition to gameplay-related elements, the UI incorporates menu screens and buttons for options like starting the game, accessing settings, and viewing achievements.
Weapons

Overview

- Player Gun (Main Player)
- Bullet (attack NPC)

Weapons Details #1
In our game, the main player wields a lifelike firearm with realistic sound and loading effects. This weapon boasts a 30-round magazine, and when ammo is depleted, an automatic reload ensues. Players face an added challenge with smaller, harder-to-hit bullets, improving the gameplay experience.

Weapons Details #2
For the bullets used by attacking NPCs, we've implemented large gray projectiles to provide players with a chance to dodge and react effectively during gameplay, enhancing the overall gaming experience.

Musical Scores and Sound Effects

Overview
- Ammo reload sound
- Walking Sound
- Running Sound
- Shooting Sound
- Jumping Sound
- Old Man NPC sound

Sound Design

Sound design is crucial for an immersive experience. We are planning realistic sound effects for ammo reloads, walking, running, shooting, and jumping. Additionally, the old NPC's voice will encourage user engagement and motivate players. Our aim is to enhance realism and emotional connection in the game.

GitHub Repository Link

https://github.com/muujii1015/3702_ict_game.git

Reference

- Sky - https://assetstore.unity.com/packages/2d/textures-materials/sky/worldskies-free-skybox-pack-86517
- Muzzle Flash - https://assetstore.unity.com/packages/2d/textures-materials/toon-muzzleflash-pack-56572
- Gun - https://assetstore.unity.com/packages/3d/props/guns/free-fps-weapon-mcx-177248
- Chair - https://assetstore.unity.com/packages/3d/props/furniture/arm-chair-80384
- Character - https://www.mixamo.com/#/?limit=96&page=1&query=&type=Motion%2CMotionPack