CHESS SHOOTER – Game in Unity

Multimedia (in English) 2019 Project

Brno University of Technology

Marios Pafitis (xpafit00) & Leonidas Achilleos(xachil00)

Contents

[**Chapter 1** - Introduction: 1](#_Toc7807289)

[**Chapter 2** - Goals: 1](#_Toc7807290)

[**Chapter 3** - Technologies & Tools Used: 2](#_Toc7807291)

[**Chapter 4** - Motivation: 2](#_Toc7807292)

[**Chapter 5** - Project Workflow Description: 2](#_Toc7807293)

[**Chapter 6** – End Results: 3](#_Toc7807294)

[6.1 Waves & Their Unique Features 3](#_Toc7807295)

[6.2 Effects, Screen Transitions & Animations 5](#_Toc7807296)

[**Chapter 7** - Conclusion: 7](#_Toc7807297)

[**Chapter 8** – Team Members: 8](#_Toc7807298)

[**Chapter 9** – Distribution of Work: 8](#_Toc7807299)

[**Chapter 10** - References: 9](#_Toc7807300)

[**Chapter 11** – Project Google Drive Files: 9](#_Toc7807301)

# **Chapter 1** - Introduction:

This is a school project for the lesson Multimedia (in English). You can find all the project files and source code in the link for the Google Drive in Chapter 11. For the theme of the subject we decided to develop a Game in Unity in order to use a multiple multimedia element such as background music, sound effects triggered by in-game events, textures, 2D animations for the UI Elements, particle effects, visual effects and screen transitions. Also, the procedure for creating a game involves several programs. We had to use Unity for the Game Developing, Microsoft Visual Studio for the C# coding, Blender for the 3D Graphics, Photoshop and Procreate for sketching, and designing the UI elements and also Premiere Pro for Video Editing. We decided to create a shooter game as we knew that we could have multiple effects for the guns, the particle effects and for sound effects. After some research online we decided that a 3D Top-Down Shooter would be a great choice for a project as we could have a lot of freedom on it to get creative.

# **Chapter 2** - Goals:

For our project we decided to make a 3D Top-Down Shooter implemented in Unity Game Engine. Our shooter should have to kill enemies that they will be spawned randomly in an arena. The arena will have the shape of a chess and the obstacles will be the chess pieces. The game will have 5 different waves and for each wave the arena will have more obstacles and more enemies that they could move faster. For the final wave we have unlimited enemies and to keep track of the Players progress we have Player’s score. The Player has three lives for each wave and a unique gun that unlocks every time he changes a wave. The guns are the pistol, riffle, shotgun, machine gun and super machine shotgun. The game should contain the following features:

* Background Music
* Sound Effects
* Particle Effects
* Visual Effects
* Death Effects
* Animations for the UI
* Screen Transitions

# **Chapter 3** - Technologies & Tools Used:

* Unity 2019.1.0f2 (Game Developing)
* Microsoft Visual Studio 2019(C# Coding)
* Photoshop CC (UI Elements)
* Procreate, iPad Application (UI Elements)
* Blender 2.8 (3D Modeling)
* Premiere Pro (Gameplay Video)

# **Chapter 4** - Motivation:

We wanted to create a game that it could combine multiple technologies and try something new for us, as developing a game. We both like games and especially 3D Shooters so we wanted to have our own game. We didn’t want to create a Multimedia Player or an Image Editor because in that way we had to work with only on kind of media. By creating a game, we could easily experiment with a variety of multimedia element and create something beautiful. We kept motivated until the end of our project as we wanted to work constantly to it and develop it as much as we can. We liked it so much that we used to play the game having the excuse that we “just testing it”. The game itself it so addictive and it offers you joy after playing it.

# **Chapter 5** - Project Workflow Description:

In order to develop the project, we split the work in half. Marios started with the first 13 tutorials and then Leonidas continue with the rest of them. We have to create the core of our game this way in order to have more time to put unique features, nice effects and visuals.

First, we made a basic arena and program our player controller. After finishing the player controller which controls the movement of our character, we could implement the gun system. The gun system was able to shoot bullets from the gun. Then was time to implement some enemies which should attack the player and perform some damage to it. The enemies are approaching the player and attack him by biting him. While the enemies are in attack mode the turn red. Now was time to create our tile map which should have some obstacles randomly generated to it. We had to create a Navigation Mesh in order for the player to recognizes where he should step or not. Moreover, we made an obstacle placement script to randomly generate obstacles in the map. Then we were able to make a map generator script for generating maps for the different waves.

Now it was the time to create some UI elements so we created the Game Over Screen. In order to make the death of the enemies look more natural we created a particle death effect when an enemy die which basically explodes sphere particles in the instance of the enemy. The particles had the direction of the bullet that had hit the enemy. For changing waves, we should reward our player with new guns so we give him the ability to unlock one new gun in each wave.

In total we created five different weapons with unique shooting types. The first weapon is the pistol, a gun that shoots single bullet and it has a wait time to shoot again. The second weapon is the riffle, which you can shoot multiple bullets before reloading. The third weapon is a machinegun which shoots multiple bullets before reloading. The forth weapon we had a shotgun that shoots multiple bullets but still has a waiting time until you can shoot again. The fifth and final gun is a combination of machinegun and shotgun in which you shoot multiple bullets like the shotgun but nonstop. For making the guns look more stanning we added some flames and lights effects coming out from the gun when you shoot and also some recoils throwing away.

We continue our project by creating a Start Menu and Screen Transitions like Fade-In and Fade-Out between scenes in order to make the transitions smoother. We added background music in the Start Screen and in the Game Scene. We had also a lot of sounds effects triggered by in-game events like the 3-2-1-Fight Countdown when you start a new wave. Sound for Player’s Death and Enemy’s Death. Sound when an Enemy Attacks when you Complete a Level or Click a Button in the Menus. Also, we had 5 different Reloading Sounds for each weapon and five different Shooting Sounds.

After finishing the tutorials, we were in a good stage to start improving and making the game suitable for the multimedia project. We did a lot of changes, upgrades in order to make the game as we wanted to be. We changed the arena adding the theme of the Chess and for the obstacles having the Chess Pieces. We made previews for the Life of the player and the equipped Gun with some spinning animations. We preferred having a 3D object visually as for the player’s life than just a health bar on the bottom of the screen. We added the countdown in the beginning of each wave with the triggered sound “3-2-1-Fight”.

We made a more beautiful Start Screen and Game Over Screen to match the theme of our game. The designs of the screens were made in Procreate by hand. Also, we added a click sound when you press any buttons in the Start Screen or in the Game Over Screen. Moreover, after learning how to create particle effects we added a Death effect for the player. When he dies, white particle spheres exploded with the death sound effect. We thought that our game should look more mysterious so we added a fog visual effect spawning from the surface of the chess arena. This effect provides a better feeling when you play the game as it makes it more natural.

**Chapter 6** – End Results:

## 6.1 Waves & Their Unique Features

|  |  |
| --- | --- |
|  | **Wave 1**  **Available Weapons:** Pistol (1)  **Enemies Speed:** Very Slow  **Enemies Spawn Time:** Very High  **Enemies Colors:** Yellow  **Chess Pieces Color Theme:** Blue  **New Weapon Unlocked:** Pistol  **Amount of Shooting Bullets:** Single Bullet  **Reloading Time:** Very Frequently |
|  | **Wave 2**  **Available Weapons:** Pistol (1), Riffle (2)  **Enemies Speed:** Slow  **Enemies Spawn Time:** High  **Enemies Colors:** Green  **Chess Pieces Color Theme:** Pink  **New Weapon Unlocked:** Riffle  **Amount of Shooting Bullets:** Multiple Bullets  **Reloading Time:** Frequently |
|  | **Wave 3**  **Available Weapons:** Pistol (1), Riffle (2), Machine Gun (3)  **Enemies Speed:** Normal  **Enemies Spawn Time:** Normal  **Enemies Colors:** Blue  **Chess Pieces Color Theme:** Brown  **New Weapon Unlocked:** Machine Gun  **Amount of Shooting Bullets:** Multiple Bullets  **Reloading Time:** Rarely |
|  | **Wave 4**  **Available Weapons:** Pistol (1), Riffle (2), Machine Gun (3), Shotgun (4)  **Enemies Speed:** Fast  **Enemies Spawn Time:** Low  **Enemies Colors:** Purple  **Chess Pieces Color Theme:** Green  **New Weapon Unlocked:** Shotgun  **Amount of Shooting Bullets:** Multiple Bullets  **Reloading Time:** Rarely |
|  | **Wave 5**  **Available Weapons:** Pistol (1), Riffle (2), Machine Gun (3), Shotgun (4), Machine Shotgun (5)  **Enemies Speed:** Very Fast  **Enemies Spawn Time:** Very Low  **Enemies Colors:** Pink  **Chess Pieces Color Theme:** Dark  **New Weapon Unlocked:** Machine Shotgun  **Amount of Shooting Bullets:** Multiple Bullets  **Reloading Time:** Very Rarely |

## 6.2 Effects, Screen Transitions & Animations

|  |  |
| --- | --- |
|  | **Loose a Life**  **When you loose a life, after you have been attacked by an enemy a heart from the three in top of the screen explodes throwing th sphere red particles all over the place.** |
|  | **Player’s Death**  **When the player loses all his three lifes he dies and in his position white sphere particles are instantiated in order to llok like the broken pieces of the player.** |
|  | **Enemy’s Death**  **When an enemy dies in his position squares having its color are instantiated in order to llok like the broken pieces of the enemy. They are moving to the direction of the bullet that hitted the enemy and they shrink slowly until they dissapear.** |
|  | **Enemy Attack**  **When an enemy attacks the player he turns red for a moment and then back to its normal color.** |
|  | **Bullet Trail + Crosshair**  **Every bullet has a trail behind it indicating the compressed air that he creates due to the speed it moves.**  **At the position of the mouse we have a crosshair in order to know where we shoot for better aiming.** |
|  | **Gun Shooting Flames + Bullet Shells + Fog**  **When we shoot the gun produces shooting flames and a light that reflects to the objects around it.**  **From the side of the gun they are exploded bullet shells.**  **We have a fog effect in the ground for creating a more realistic atmosphere** |
|  | **Flashing Red Tiles**  **When a red tile flashes it means that an enemy is going to be spawned in that place. The tiles are choosen randomly.** |
|  | **Start Screen + Transition**  **When you mouse over the play button it gets bigger and ehrn you press it you can hear the click sound effect.**  **The play button Fades-Out the Strat Screen and Fades-In the Game Scene.** |
|  | **Game Over Screen**  **When you lose yhe Game Over Screen appears with your current score.**  **The menu button Fades-Out the Game Over Screen and Fades-In the Start Scene.**  **The play button Fades-Out the Game Over Screen and Fades-In the Game Scene.** |
|  | **Moving UI Elements + Countdown**  **When you start a new wave the countdown starts counting with the sound „3-2-1-Fight“ having the text animated when they Grow and Shrink.**  **The Black Bar in the bottom of the screen appears and dissapears when we start a new wabe telling us the wave number and the amount of enemies we have to face.** |
|  | **Heart Preview + Gun Preview + Score**  **The Heart Previews in the Top Middle of the screen indicates us the amount of lifes we have while they are spinning around itself.**  **The Gun Preview in the Top Right corner of the screen inticates us the gun that we have equiped. We can change the equiped gun by pressing the number 1-5 if we have already unlocked the gun by passing a wave.**  **We can see our score in the bottom of the screen** |

# **Chapter 7** - Conclusion:

We are very satisfied from the final overall result of the project. We have spent a lot of hours on it keep trying to improve it and make it as good as possible. We have tried to use as many multimedia elements as possible because we wanted to have the best result. Also, we did a lot of testing for the game in order to eliminate most of the bugs. The version we currently submit is a solid version of the game and fully playable. We could implement more things like a save system but it is not necessary for the purposes of the current project. All the assets and the tutorials and the lines of codes that we have used in the game are Royalty Free. This game was a great experience for both of us as we had great time while developing and sharing ideas like a team. Moreover, the game is not just a project for a lesson, is great as a way of having fun as it is very addictive.

# **Chapter 8** – Team Members:

* Marios Pafitis (xpafit00)
* Leonidas Achilleos (xachil00)

# **Chapter 9** – Distribution of Work:

* Marios Pafitis (xpafit00)
  + Player Controller
  + Gun System
  + Enemies
  + Damage System
  + Enemy Attacks + Collisions
  + Tile Map
  + Obstacle Placement
  + Map Connectivity
  + Map Navigation
  + Map Generator
  + Particle Death Effect (Player)
  + Life Spinning Preview
  + Life Loose Destroy Effect
  + Fog Visual Effect
  + UI Elements Design in Photoshop and Procreate
  + Screen Recording and Video Editing for Game Play Video
  + Game Testing
* Leonidas Achilleos (xachil00)
  + Random Spawning
  + Game Over Screen
  + Particle Death Effect (Enemies)
  + Weapon Effects
  + Weapon Variations
  + Weapon Spinning Preview
  + Wave Difficulty
  + Crosshairs
  + Recoil and Reloading
  + UI Implementation
  + Audio
  + Menu
  + Screen Transitions
  + Game Testing

# **Chapter 10** - References:

* [Unity Create a Game Series (Introduction)](https://www.youtube.com/watch?v=SviIeTt2_Lc&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0)
* [Unity Create a Game Series (E01. player controller)](https://www.youtube.com/watch?v=jdv8erC7ML8&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=2)
* [Unity Create a Game Series (E02. gun system)](https://www.youtube.com/watch?v=rZAnnyensgs&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=3)
* [Unity Create a Game Series (E03. enemies)](https://www.youtube.com/watch?v=UnPZyFjUvOM&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=4)
* [Unity Create a Game Series (E04. damage system)](https://www.youtube.com/watch?v=v0zVBtZpB-8&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=5)
* [Unity Create a Game Series (E05. spawn system)](https://www.youtube.com/watch?v=ajwRvAGKl_k&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=6)
* [Unity Create a Game Series (E06. enemy attacks)](https://www.youtube.com/watch?v=njqRlH3Hj3Q&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=7)
* [Unity Create a Game Series (E07. some loose ends)](https://www.youtube.com/watch?v=-mEbCEENpjU&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=8)
* [Unity Create a Game Series (E08. tile map)](https://www.youtube.com/watch?v=gIUVRYViG_g&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=9)
* [Unity Create a Game Series (E09. obstacle placement)](https://www.youtube.com/watch?v=q7BL-lboRXo&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=10)
* [Unity Create a Game Series (E10. map connectivity)](https://www.youtube.com/watch?v=2ycN6ZkWgOo&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=11)
* [Unity Create a Game Series (E11. map navigation)](https://www.youtube.com/watch?v=vQgLdFNrCN8&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=12)
* [Unity Create a Game Series (E12. finishing the map generator)](https://www.youtube.com/watch?v=HuQITd3epIU&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=13)
* [Unity Create a Game Series (E13. random spawning)](https://www.youtube.com/watch?v=vOC3usydLeE&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=14)
* [Unity Create a Game Series (E14. game over)](https://www.youtube.com/watch?v=YaLMri-h1JQ&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=15)
* [Unity Create a Game Series (E15. particle death effect)](https://www.youtube.com/watch?v=PAKYDX9gPNQ&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=16)
* [Unity Create a Game Series (E16. weapon effects)](https://www.youtube.com/watch?v=e1XO53GA7xM&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=17)
* [Unity Create a Game Series (E17. weapon variation)](https://www.youtube.com/watch?v=yfSN6W98r4I&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=18)
* [Unity Create a Game Series (E18. wave difficulty)](https://www.youtube.com/watch?v=8fZIZMlC69s&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=19)
* [Unity Create a Game Series (E19. crosshairs)](https://www.youtube.com/watch?v=9bYy1uqHY0Q&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=20)
* [Unity Create a Game Series (E20. recoil and reloading)](https://www.youtube.com/watch?v=r8JTwe6dewU&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=21)
* [Unity Create a Game Series (E21. Guns and UI)](https://www.youtube.com/watch?v=yoIPKI_iK5E&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=22)
* [Unity Create a Game Series (E22. Audio pt.1)](https://www.youtube.com/watch?v=C65ExBy6WPA&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=23)
* [Unity Create a Game Series (E23. Audio pt.2)](https://www.youtube.com/watch?v=xvpP9U20ioQ&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=24)
* [Unity Create a Game Series (E24. Menu)](https://www.youtube.com/watch?v=EA-tBcTxE8M&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=25)
* [Unity Create a Game Series (E25. Finishing up)](https://www.youtube.com/watch?v=_Ue8P4tNXOg&list=PLFt_AvWsXl0ctd4dgE1F8g3uec4zKNRV0&index=26)
* [Assets TARBO - Lowpoly Chess Pack [FREE]](https://assetstore.unity.com/packages/3d/props/tarbo-lowpoly-chess-pack-free-141219)

# **Chapter 11** – Project Google Drive Files:

* [Google Drive Link](https://drive.google.com/drive/folders/1Nn528MPY4bb3W_pam0bkPQYdHj4wi16n?usp=sharing)