ECS7003P – Multi-Platform Game Development 2018/19

Planetary Defender: Game Design Document

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Telikos Protocol- Rail gun platforms by Adam Burn [1200x651] - http://adamburn.deviantart.com/

Prototype Gameplay - https://youtu.be/LFowzCpCgoQ

1. Concept

1.1. Statement

In a nutshell, Planetary Defender is a turret based first person shooter set on a space station during an alien invasion. The game is orientated around the final remaining orbital, fortified space station. The objective of the game will be to destroy all enemy ships inbound to the planet the space station is defending in order to save the planet from the alien invasion. The game should incite feelings of moderate pressure and excitement through scenes of interstellar combat, which will require tactical prowess to complete.

1.2. Genre

The dominant game genre Planetary Defender fits into is first person shooter (FPS). The game will differ slightly from a usual FPS, where players control a humanoid avatar, which can move in its environment. In this case the player will control turret-based weapons that will be fixed in position offering only options to change the aim of the weapons. Another closely related game genre Planetary Defender may be an example of is a tower defence. Like most tower defence games, in Planetary Defender, the player must decide which weapon or tower will be the most effective against the upcoming enemies. However, unlike usual tower defence games, in Planetary Defender, the player will have full control over the tower of choice during combat. Finally, Planetary Defender also falls into the much broader genre, Sci-fi, which comes with its own alluring elements and is popular genre for almost all forms of media.

1.3. Target Audience

Planetary Defender will most likely appeal to all Sci-fi fans, as the space setting is often quite distinctive. Because of the first person control, Planetary Defender will likely appeal to most players of FPS games and shooter games in general. Planetary Defender offers opportunities for intense tactical combat, which would appeal to players from a broad range of game genres involving similar combat opportunities like Real-time-tactic games and Vehicular combat games. Because Planetary Defender has turret based combat, the controls of the game are reduced as compared to a usual FPS game where the player might be required to control the movement of the game avatar, this makes Planetary defender somewhat easier to play in that respect and therefore it is accessible to people who may not be seasoned gamers and lack the required skill to be successful in conventional FPS games.

2. Design

2.1. Player Experience

The point of view of the player will be from one of the weapon systems aboard the space station. This point of view will follow the usual FPS standard with a heads up display (HUD), crosshair, and some view of the weapon system and space station the player is controlling. With the player having access to an arsenal of weapons, the HUD and view of the barrel of the weapon, should it have one, will each be different and represent the utility of the weapon and help the player in their attempts to use the weapon to destroy the enemy spacecraft. Some examples of this might be, for a high fire rate blaster, the HUD will display a heating bar which increases its value as the player uses the weapon continuously and will eventually signal the weapon to stop working for a short time while it cools. A universal feature of the HUD throughout each weapon will be a health bar for the space station as a whole. As enemy ships damage the space station this station health will decrease with the opportunity to replenish this health with resources periodically delivered from the Planet to the station. If this station health decreases to zero the station will be destroyed and the game will end. Each weapon system will occupy its own position on the space station and where the player will have control over when to switch weapons and which weapon to switch between. The two gunner positions created for the prototype are displayed below in figure 1.
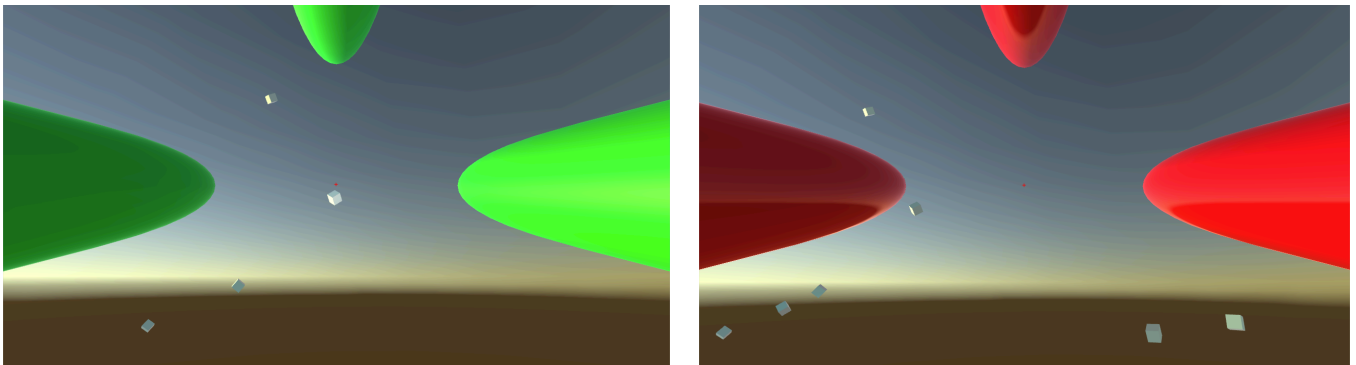

Figure 1: Print screens of gunner position 0 (left-green) and gunner position 1 (red-right) from prototype of Planetary Defence, taken as the projectiles fired from these two positions are instantiated.

Alongside the view of the controllable elements of the game like the weapon and camera angle, the player will get a view of inbound enemy ships of various class, each representing its own unique threat to the players and conversely each have its own unique vulnerability to a particular weapon in the space station's arsenal. There will also be an interactive backdrop to the scene, which will appear to give some depth to the distant stars and planets in the surrounding universe. Most notably, the space station will be situated in orbit of the Planet it is defending and the player will have full view of this planet at certain camera angles as well as the sun providing this planet light. This environment should incite a feeling of awe in the player such that the environment could be interesting enough to just observe without playing the game. During gameplay, the player should encounter feelings of urgency as the enemy craft deal damage to the station and they attempt to destroy the craft before the station is destroyed. This should make the combat sequences between the enemy and player engaging and exciting whilst being challenging enough to retain the seriousness that the player is defending a planet from alien invasion.

2.2. Visual & Audio Style

The visual style will be that of a typical realist impression of a human future. Sci-fi media often follows this mantra and there are several films, TV-shows and games, which can be referenced to share the artistic visual and audio style this game aims to achieve. Some of the game franchises which are set with a similar style to Planetary Defence are; Halo, Mass Effect and Destiny. These franchises aim to create striking environment and virtual structures Figure 2 shows concept art for a spacecraft in the Mass Effect universe.

Figure 2: *Concept art for Mass Effect: Andromeda of spacecraft in style which Planetary Defender aims to replicate.*

The audio style of Planetary Defender also aims to reach that of the previously mentioned franchises. Weapon fire, explosions and spacecraft engine all will resemble realistic audio and add to the feeling of seriousness and immersion of the game. The audio and visual style adopted by games like Halo and Destiny help create a sense of grandeur to the gameplay which gives it a presence of importance and allows players a greater opportunity for immersion. This feeling is what Planetary Defence is aiming create.

2.3. Game World Fiction

The game world is home to a futuristic, technologically advanced universe containing humans and aliens. Humans have migrated from Earth and now reside on a different Earth like planet. Advancements in technology has enabled for the creation of highly powerful weaponry. The natural architecture of this universe still resembles what appears today. Meaning the surface of the Earth like planet is still mostly natural and not constructed. This planet still also orbits its own sun, which provides energy to the planet.

In Planetary Defence the player will be introduced to the future Earth like planet harbouring human life. This planet is home to a highly advanced defence system of interstellar fortifications. These fortifications include the space station our player has control over. The player will then be introduced to our character, the chief orbital weapons system operator of the space station and to the various weapons the station has in its arsenal.

The player will then be taken through the narrative of the onslaught of the alien invasion and the intense pressure the planet has been under as well as its planetary defences. The game will then begin. During the first few waves of alien invaders it will then be revealed that the final defence against the last of the alien invaders is the space station commanded by our character. The game will then follow waves of different alien spacecraft which must be defeated to reach the final wave of alien spacecraft consisting primarily of an alien mother ship which must then be destroyed. During this final battle it will be revealed to the player that in order to destroy the mother ship the space station and all of its crew must activate an on board weapon which will destroy the station and all of its crew. At this point a new weapon will become available to the player and must be used to destroy the alien mother ship.

After the alien mother ship has been destroyed, the player will view a short cutscene of the planet, safe in the wake of the invasion. The player will then be thanked for playing and returned to the main menu.

2.4. Core Gameplay

The most important game object in the space station while the station has health, the player can use the on board weapons to destroy enemy spacecraft. This is the most important game object, it is for all intensive purposes, the player and if this object is destroyed the game is over. The second most important game objects are the weapons or their respective components (projectiles, rays etc). These objects allow the player to destroy enemy craft and prevent the space station from being destroyed by the enemy. The alien spacecraft objects will represent targets to destroy using the provided arsenal. Each type of alien craft will represent a different threat to the station and will have its own unique weakness to one of the weapons in the stations arsenal. This allows for tactical gameplay, and by designing the game to be difficult when the player is not acting and reacting to the enemy ships offence, the player must constantly change weapon and priority in order to successfully hold back the alien invaders.

This type of gameplay presents its own challenges in terms of tactics. However, it will also present challenges in terms of player skill, as player become more experienced with each weapon, they will learn the weapons firing characteristics and how each weapon is best utilised in order to accurately defeat enemies. This provides an engaging challenging experience by enabling the player to realise the ideal weapon and tactic for each individual situation. Another way in which the game objects provide immersion to the player is by behaving in a way which reflects the intention of the audio and visual style. This means, as a projectile is fired, whether it be from the station weaponry or an enemy craft, the correct sound is heard by the player and the volume of the sound must also reflect the distance away from the player the shot is fired from. When the projectile flies through space, a realistic noise should emanate from the projectile and increase in volume as it approaches the station. Finally the sound of the projectile colliding with the station should also be resemblant of a realistic situation, in this case, an explosion should occur upon collision with the station and a louder audio clip than that of the fire of the projectile and flight of the projectile should be played. This accumulation of events with their respective particle effects, audio, and tactical gameplay will create an engaging gaming experience.

2.5. Objectives & Progression

The main goal of Planetary Defence is to destroy the incoming alien spacecraft as quickly as possible or before they destroy the player's space station. This overall goal can be broken up in to smaller objectives which each must be completed in order to successfully complete the game. The first is to effectively fire at enemy spacecraft such that the weaponry damages the alien spacecraft. This means the player must aim accurately and also chose a weapon that the enemy craft does not have immunity to. Secondly, the player must then destroy a wave of incoming enemies, this requires that the correct weapon selection is made and the damage sustained to the station during the wave is not so severe as to make the next wave of alien spacecraft impossible to withstand. The next objective of the player is to prioritise their defence such that the enemies that pose the most threat to the station are destroyed before the enemies that pose the least of a threat. The completion of these objectives by the player will enable them to defeat waves of increasing difficulty and variation and thus progress through the game.

In the short term the player should focus on identifying individual alien ships which need to be destroyed at the highest priority. Then the player should determine the most suitable weapon for destroying the identified craft and efficiently destroying the identified craft while considering the time taken to destroy each enemy and thus the damage sustained over the period of one wave of alien offence. These short term goals should be met during each wave to successfully reach the long term goal of destroying the alien mother ship and defending the planet from the alien invasion.

The implicit goals of the player are to determine through trial and error the most effective techniques of destroying alien spacecraft in the shortest time possible. This includes the tactical abilities of weapon selection and enemy prioritisation and also the skill based techniques of weapon accuracy and fast weapon switches.

2.6. Game Systems

One major system the player interacts with is the weaponry system. In order to fire a weapon, the player must first aim at the desired target. In order to successfully do this in a three dimensional environment, the player uses a first person perspective and can change the angle the game camera looks toward. In order to aim accurately and operate the weapons, a HUD system must be implemented for each weapon. This HUD must contain a crosshair; this allows the player to effectively aim each weapon. The HUD must also contain the current weapons metric. As previously described, this metric may be different for each weapon and represents the characteristics of each weapon and allows the player to monitor its limitation. The HUD must also include a representation of the station health so that the player can detect how the current alien offence is effecting the station and from this the player can effectively plan a response and destroy the alien ships in an efficient way. The projectile or ray systems for each weapon must also be reasonable, if a projectile move so slowly that it becomes impossible to cause them to collide with enemy ships it will cause the weapon that projectile belongs to to become defunct and ineffective against the alien ship susceptible to it.

An important game system that the player doesn't interact with is the enemy system. Enemies must move in such a way that they are easy for the player to defeat individually but as a wave become difficult and require tactical knowledge and skill to defeat. This means the algorithm that governs their movement must reflect their threat level as well as the algorithm which governs their weapon systems. Alien ships that pose a high threat to the station will likely move more slowly or predictably and have a larger health than ships which can deal less damage over time to the station. High threat ships may also appear less frequently during waves than low threat ships and can be larger and easier to shoot because of their high risk.

2.7. Interaction

Prototype Controls
- Mouse – The mouse movement controls the aim of the weapon systems. Of all control systems available, the most allows for most accurate and quickly varying aiming method. Accuracy and time are both highly important aspects of the player aim and proficiency in these areas will improve player performance. The mouse click also fires the weapon currently under control of the player.
- Space – The space bar switches the player between weapon types. In the prototype, this weapon switch has no effect other than to change the position of the player and change the projectile colour from green to red or vice versa.

The final game will add controls for switching between multiple weapons, likely using the numbers on the keyboard as well as space to scroll through weapons one by one.

As previously mentioned the UI system will have to be encompassed into a HUD, displaying relevant information for each weapon individually, as well as general information about the station useful to the player at all times. A canvas system will have to be implemented in order to display the start menu of the game, from which visual and audio settings can be altered as well as camera sensitivity and weapon scroll key.