Book of Specifications: Aperture

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JOHN Rajat

BEKHAT Sofiane

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1 Introduction

We, VolTeX studios, will discuss in the following pages, the first year computer science project at EPITA that we will undertake for the following 7 months (2020).

1.1 The Members

1.1.1 TALLEC "α" Scott

Hello, I would like to present myself, my name is Scott TALLEC and as of writing this, I am a first year at EPITA student (2020) and the outstanding leader of VolTeX studios. I am still waiting for my applause. Computer Science has been a recent endeavour of mine, I've had my eye out for CS for quite some time but never actually immersed myself in it until recently. Therefore, I may not be as experience as many of the other project leaders but what I do have is a drive, ambition and a desire to learn. Of course that's not without mentioning a World-class team.

My background is in Python, OCaml, C# and C mostly doing imperative programming. Í have ~~tremendous~~ little experience in Unity and therefore have much to learn and am willing to do so. I'm planning on working on the network of the game in addition to working on the physics implementation of the game. Obviously I will be assisting my peers in their tasks if they encounter any difficulties.

Video Games have in general been a fascination for me from the time my Grandmother gifted me a Game Boy with Super Mario Bros 3. As I grew older my tastes matured and I began truly appreciating games for something intangible. That was the people who were behind the making of a game as well as the immense thought that was put into them. Some elements which I took for granted when I was young, I learned to recognize in my later years. Throughout my life, few games and even fewer studios have stood out to me for their ingenious game design. One of those studios was Valve, their games notably Half Life (1 and 2) and Portal (1 and 2) inspired me to propose this project, hence the name **Aperture**.

1.1.2 BOSE "β" Abhishek(Abhi)

Bonjour! I am the Harry Potter looking guy, Abhishek BOSE. No! No! Don't confuse me with the company BOSE. I am not the owner of that company. I think you could qualify me as quite an intermediate level of programmer. I cannot call myself a geek because I have a life outside of computers (no offence).

Before joining EPITA, I only knew HTML, and Adobe Photoshop. But I can assure you, that I am a hardworking, and a passionate guy, who has the will to learn new things. Until now, I have had the experience of coding on OCaml, C#, and Python, and the experience has been good so far.

This project has really piqued my curiosity to learn more about object-oriented C# programming. Also, since childhood, I have always loved playing video games, and this is a great opportunity to develop a skill set which could prove to be essential later in my life. I have already learned a lot by watching tutorials of how to create a game on unity. My main contribution to this project would be working on unity and creating codes for the game. I will be handling the gameplay for most part of it.

1.1.3 JOHN "Ω" Rajat

Moving on...I'm Rajat, the brains behind this operation.

I say I am the brains with hard evidence of course as between us, I have had the most experience with programming. Albeit with C++ , I imagine the transition should not be too difficult.

I love to solve puzzles and creating them to annoy other people is a passion of mine. With my experience in programming, I will mainly be focused on the code of the game and the level design. I shall also support our ~~"leader"~~ great leader with the implementation of the multiplayer aspect of our game. I have had some experience in mixing music as well, thus I will help out with the sound design of the game. I love to learn and this project will be a great way to gain some knowledge I could use later in life as game design is one of my career options.

As you can see I am what you might call a "jack of all trades, master of few". Being the support character in the team, I hope I can put my expertise

to good use to help out the team because at the end of the day it is a group project and I could not be more excited.

1.1.4 BEKHAT "γ" Sofiane

Salut! I am Sofiane Bekhat and I was born on the same year when the games became relevant. Ever since I was introduced to video games, I became captivated by their depth and complexity. I did not see them merely as a form of entertainment to pass time. As games developed with time, my curiosity grew stronger. Playing video games was not enough for me anymore. I needed to know how they were created and brought to life.

Therefore, I started off by searching the process of video games development and also learning how game engines work, specifically Cryengine. Besides, My High school gave me an opportunity to study computer science in which I have learnt the basics of C, HTML, CSS and Autocad.

This project is an opportunity for me to dive into the world of game development and develop skills which will be essential in my career.In addition, My focus on this project is the level design and the game design and all aspects related to it, like animations, graphics, and 3D modelling.

1.2 The project

The project that we are going to present is in C# with the Unity library. The game will be in 3D and will possess multiplayer capabilities (Co-op). The project will feature different tools that give the player capabilities based on the level and the goal will therefore be to solve the given puzzles with the tools provided.

The Project is to make a 3D First-Person Action/Puzzle game with Co-op Multiplayer. The main goal of the project is to implement enemies with basic AI, weapons, objects in game that you can interact with to solve Puzzles utilizing unique mechanics which would involve the physics of the game.

We are choosing to write C# code for our project, with the Unity overlay. Unity, which has a complete library, seemed to us to be the most suitable engine for our first large game . Furthermore, Unity provides an integrated physics engine. We are impatient to be able to test the many possibilities of this language and this library. For a first game, with Unity's C language and simple yet efficient libraries, it becomes the more obvious choice for a game engine.

We were indeed directly inspired by a game called *PORTAL* which uses the Source engine. The system is very simple: the player controls, in first person (the view is placed in the character's perspective), moves of the character, and the aim of the weapon. The player has to reach the end of the stage, through a series of various obstacles in order to go to the next level.

The essence is of the game is to make it as seamless as possible that means making it as accessible and simple for the user as possible. All aspects of the game should reflect this, that includes the menu, mechanics, aesthetics and level design. The final goal is therefore to go through all the levels of the game, by bypassing the enemies (whether through direct conflict or not) and by solving the puzzles.

2 Project Breakdown

2.1 Controls and Gameplay

2.1.1 The Controls

First of all, the commands are very basic, so we have:

Movement: The character will move thanks to the keyboard, quite simply, with various adjustments in the options according to the type of keyboard (QWERTY, or quite simply the directional arrows).

Shots: The character will either start with "weapons" or pick them up progressively throughout the stage with which the use will aim with using the their mouse. The player will walk one a plane, will have the capability to jump and walk/run around freely within the stage.

Overheating : Because we are in a sci-fi environment, the weapons don't use ammo. Instead, the gun will overheat after a using the gun for a certain time. It will also cool down after a delay.

As you can see, the gameplay might seem simple, but that's exactly the point. The game's mechanics and basis should be simple in order to emphasizing the important content within the game.

2.1.2 The Gameplay

Regarding the mechanics of the game, the game play, we mainly want to create a puzzle solving game that has a tinge of darkness spooky and violence.

Regarding the shots: We will make a continuous firing system (without having to click n times on the mouse to fire n projectiles) within the limit of the firing frequency.

Health: The player, like the droid, is not immortal. This is why you will therefore have a life gauge while playing the game, which will be decremented according to the number of damage the droid will have caused you, during an attack but will automatically regenerate afterwards. Unlike the droids.

The player respawns to the beginning of the stage if he dies, *Respawning*, or when you make it through all the levels *Congratulations!*, Or even when .. you leave the game .. *QUIT*.

2.2 The Graphics

In a game, you need a minimum of graphics to make it work properly. We will see which are necessary for our project:

2.3 The Animations

The game, being 3D and multiplayer, will need player models. We will make use of blender to model the player, enemies, and all needed assets for the game that includes animations for the different actions taken in game.

For these animations, our focus is to animate the body movement of the player and all the enemies that will be present in the game. For instance the walking, running and jumping animation. In addition, the weapons that we will use will be animated according to their function.

2.4 The Network

The network here is a compulsory passage for the multiplayer mode, because the commands (With the keyboard and the mouse) cannot be shared on a single screen, the game will not be local co-op

This is why it will therefore be necessary to establish a WLAN system by direct connection, that is to say by IP.

This will therefore cause the appearance of another character in the game. Players will therefore have different tools and they will require each others help to finish the level. The players must also be able to communicate with each other, this can be done through the implementation of an in-game chat.

The multiplayer, network game seems interesting but complex to set up. This makes it possible to add another dimension to the game, in a cooperative.

2.5 Sound

The atmosphere is an important factor in a game of this type. This is why we will need several sounds:

Atmospheric sounds: We will need ambiance throughout the game to make the game more immersive thanks to the sounds.

Shots: Of course, the weapons will each emit a sound when being shot.

Droids: Then there will be sounds when the droids move with the aim of making the game more realistic.

Movement: The player will make noise as he traverses the stage.

2.6 User Interface

2.6.1 The Main Menu

The main menu will be the first impression the player will have with the game. Thusly, the menu needs to embody the game, as mentioned previously, this menu will simple and contain the following elements:

Multiplayer : The game being a Co-op, you will be able to access the this mode from the main menu.

Single-player : The game will also have a Single-player mode in case no other players are available but this will require special Single-Player stages to complete (minor mode).

Options : The main menu will have an options menu from which you can change the resolution, volume, and set the game to fullscreen.

2.6.2 HUD

Inventory: The player will need to access his or her weapons by scrolling, when scrolling the different weapons will make themselves apparent to help the player pick the weapon he wishes.

2.7 Website

The website will be our road map throughout the project. A history of our projects, our game versions, our various reports will be included. We will also include the problems we have faced, as well as the solutions to it.

We will be using HTML and Wordpress to create our website.

We will therefore constantly update our website, for the visitors to know about our progress.

3 Distribution of Tasks

3.1 Distribution among group members

Even if a distribution of the tasks is necessary, we wish to ensure that each of the members of the group can program, participate in the implementation of different aspects of the game. It seems normal to work together with each task assigned to certain members maximize the overall group's efficiency.

3.2 Advancement

Progress Table

Members	Gameplay	AI	Graphics	Network	Interface	Website	Level-Design
Scott	A	A		R			A
Abhi	R		A			R	
Rajat		R	A	A	R		
Sofiane			R		A	A	R
1st Report	40 %	25%	20%	40 %	20%	15%	15%
2nd Report	60%	60 %	50 %	80 %	60%	65%	50 %
3rd Report	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Legend : A = Assisting, R = Responsible

4 Conclusion

Our project is therefore a Multiplayer game coded in C# which is based 3D light FPS and puzzle solving titles and represents a great challenge for us. Each one of us is excited and motivated to work on this project. With Co-op mode, the game has potential and we hope to accomplish our goals set out for it. The personal and collective work we will provide will undoubtedly be a learning experience that will serve us for the rest of our lives and make us truly appreciate the world of game development.