

Group name : NoGaMa

Maxence Crouzy

Lancelot Martin

Gabriel Glazman

Helena Ataker

# Book of specifications for S2 project

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# Summary

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# 1 Introduction

As part of the S2 programming project, we present to you these specifications in which we will detail the approach that we will follow to carry out this project.

Indeed, being able to develop a functional video-game and a pleasant one, it is essential to maintain a certain rigor within the group during its entire conception.

Here are the goals of this project :

- Learn more about group programming and organization
- Simulate the constraints and the functioning of the business world (deadlines, etc.)
- Create a concrete application
- Apply the knowledge acquired in class and acquire more knowledge
- Figuring out how to solve different problems related to the conception of the project
- Having fun while doing what we like

We will now briefly introduce the members of the group. The group leader is Maxence Crouzy, an ENG2 student as all the others in the group.

The other members are Lancelot Martin, Gabriel Glazman and Helena Ataker, first years in International Section at EPITA.

Bounty Hunter will be a game of type MOBA<sup>1</sup> in which players embody combat vehicles in an arena. Different vehicles will have special abilities, sometimes allowing them to modify the terrain or favor it under certain conditions.

The game will be in 2.5D<sup>2</sup>, which will allow us to implement an exclusively isometric vision.

The player will control a single vehicle in several game modes, each with different

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1. MOBA : Multiplayer Online Battle Arena  
2. 2.5D : 3D models in 2D

victory conditions and will be able to play in PvP<sup>3</sup> or in PvE<sup>4</sup> which implies the implementation of artificial intelligence.

The system allowing us to carry out all these implementations is Unity, a 3D engine specialized in video games.

Unity accepts C# and JavaScript languages, two languages that we are more or less familiar with, which will help us during development.

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3. PvP : Player versus Player  
4. PvE : Player versus Environment

## 2 Origins

At the beginning of the year, we found ourselves in the same class, and we quickly became friends thanks to our common points. In particular our interest for the game *Brawl Stars*. Shortly after, we learned that we should be creating a video game for this project.

We immediately knew that we wanted to program a game of this type, very intuitive and fun to play.

We knew that putting us together to carry out this project would be beneficial for us because of our reliability in our working method and our mutual trust.

To develop *Bounty Hunter*, we decided to use Unity<sup>5</sup> as a 3D engine, because it is a relatively easy to use software that allows one to develop without worrying about programming constraints.

We will also use 3D modeling software such as *Blender* or graphics like *Photoshop*.

## 3 A little bit of history

In 1998 EA Redwood Shores released the game *Future Cop : LAPD*, considered the first MOBA of all time. The player embodied a robot and his objective was to capture enemy bases. The specifications of this game are the diversity of the arming of the robot and the customization that was offered to the player.

Later, Riot Games published *League of Legends* in 2009, the most downloaded game in the world, then Valve Corporation released *Dota 2* in 2013 and finally Supercell developed and published the application *Brawl Stars*, demonstrating the versatility of the MOBA type.

The particularity of MOBA video games is their interactivity, their need for reaction on the part of the player and the isometric position of the camera.

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5. Unity : Real-Time Development Platform

## 4 Group

### 4.1 Members

- Maxence Crouzy : Since i was born, I have always played video games. I learned English by playing Pokemon. I have always been interested in computer science, this is why I began my studies here at EPITA. At EPITA, I learned how to program, and this project will help me to improve my skills. I hope that using *Unity* will improve my coding skills. In this project, I will mainly create the Music, the different maps, write in LaTeX, and the HUD<sup>6</sup>eads Up Display, including the menu. I am very excited because this project will teach me how to work in group, something we didn't do much in S1. The final goal is very interesting because we will finally see the concrete results of our work.

- Lancelot Martin : I have been passionate about development for about eight years and started programming with *Scratch*, a language created by MIT researchers to introduce children to programming. I then continued my learning in Computer Science by learning HTML and JavaScript. I am particularly motivated by this project because the theme pleases me and I think I can bring a lot to my group. I think I'll take care of the pure development parts of *Bounty Hunter*, support my teammates in the development of the website as well as the LaTeX drafting of the specifications and other stuff.

- Gabriel Glazman : Programming has always been what I wanted to do later in my life. As a kid, I used to buy small robots in kit that i had to solder and then program. My interest in this project and my desire to carry this project to the end lets me think that it will be a great experience for me. Since I like most aspects of the conception of the project, I think that I will be quite helpful on many sides. My programming skills are the knowledge of the languages Python, HTML, CSS, the full creation of the back-end of a website (server in Python with a non-SQL database).

- Helena Ataker : I have been interested in coding since I was a child. I began programming in Python and it made me want to continue my studies in computer science. I really want to be part of this project because I know it will allow me to learn new things, gain responsibility and knowledge. I also think that being an international student can give to the group other points of views.

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6. H

## 4.2 Division of labour

Here is a summary table of the division of labour explained here.

M : Maxence Crouzy

G : Gabriel Glazman

L : Lancelot Martin

H : Helena Ataker

Task distribution summary table :

Tasks	M	G	L	H
Developing the engine	+	+	$\oplus$	+
Player interface	$\oplus$	$\oplus$		+
Design of maps/levels	$\oplus$			$\oplus$
Website			+	$\oplus$
Composition of musics	$\oplus$	+		
3D models realization	+	$\oplus$		
Implementation of models	+	$\oplus$		+
Online mode management		$\oplus$	$\oplus$	
L <sup>A</sup> T <sub>E</sub> X	+		$\oplus$	

$\oplus$  : Responsible

+

## 4.3 Tasks

To carry out this type of project, we have to share all the tasks between the different members of the group according to their specialties, so that's what we did.

The "main" task is the heart of the project, namely the game mechanics etc, what we will call the game engine.

It consists of fixing the physical rules of the game, defining the various assets of the vehicles and managing the player's controls. It is because of its great importance that all members of the group will be required to complete it successfully.

The creation of the player interface consists of defining how the player can launch a game, save it or even make various improvements to their vehicles.

The design of the different maps and levels is essential in a game that we want to be diversified and interesting. They will be done using the tiles map present on *Unity*.

The website will explain all the mechanics of *Bounty Hunter*, will present tutorials, ways to contact *NoGaMa* and explain the procedures we followed during the development of our project.

We decided to create our own music to animate the game-play of *Bounty Hunter*, which will take a long time due to the complexity of the task.



The 3D models implemented in *Bounty Hunter* will be inspired by models already available for free for some but by modifying them to make them more personal. They will then be implemented in the game files to finalize the graphics.

Being a MOBA, *Bounty Hunter* need to have a multiplayer online mode, requiring the use of online servers to manage synchronization, player positions, etc. The game will offer modes in PvP and PvE as explained before.

The specifications as well as the patch notes must be written using L<sup>A</sup>T<sub>E</sub>X, to embellish their final rendering.

## 5 Functional parts

After all these more or less complex explanations, you may not have yet fully understood what will consist *Bounty Hunter*. This is why we will more simply re-describe the principle of the game.

*Bounty Hunter* will be a MOBA type game, played solo or in multiplayer, in cooperation or in duel.

The player will embody a vehicle armed with different weapons and having various advantages that will benefit him in certain situations.

Using his vehicle, the player must either eliminate other players to score points or join them to fulfill various objectives or fight other vehicles, controlled by artificial intelligence.

The player will progress in the game as his long-term game-play progresses, improving his vehicles with the game's own money and earning a unit of points to establish rankings.

The player can create a private room by choosing the game mode to invite his friends or partners to play with him online.

The progression in the game is almost infinite, that is to say that the player can improve his vehicles as much as he wishes as long as he has the money built into the game.

## 6 Technical parts and methodology

To present a clean, optimized and therefore worked game, we will mainly use the code editor *Rider* to code in C or JavaScript in some cases.

For the 3D engine part and implementation of the code and the timeline of *Bounty Hunter*, we will use *Unity*, an easy to use 3D engine.

We will use the software *Blender* for the design of 3D models of vehicles and "tiles" of the different maps available.

## 7 Operational part

During the development of *Bounty Hunter*, some tasks will take longer than others. For example, the design of the cards will be shorter than the composition of the game music. This is why the tasks are distributed according to the facilities of each member of the group, to optimize the time of each.

The evolution of the project should take place as the table opposite explains to us.

Tasks	P	I	F
Developing the engine	30	70	100
Player interface	20	50	100
Design of maps/levels	80	90	100
Website	20	50	100
Composition of musics	20	50	100
3D models realization	70	100	100
Implementation of models	50	70	100
Online mode management	50	70	100
L <sup>A</sup> T <sub>E</sub> X	50	80	100

P : First oral

I : Intermediate oral

F : Final oral

Data in percentages

## 8 Conclusion

*Bounty Hunter* is a reasonably large project, but the group *NoGaMa* think they are up to the challenge. We will do our best to make the game as attractive as possible, easy to use but above all fun.

We will no doubt encounter problems, but we will do everything to overcome them and therefore learn more.