GAME DESIGN DOCUMENT

Gabor Juhasz-Hartmann (B00348029)

Mohammed Ibrar (B00348058)

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Game Design

Game Overview

Subtronic is a 2D side-scrolling shooter game. The player's goal is to find Atlantis and its treasure using a submarine. The game will be developed to Windows browsers. Subtronic is a single player game without multiplayer feature. The game will be suitable from the age of 7 and upwards, as the controls are very simple, and the game's art-style will be stylistic without gore or scare effects.

Game Concept

Subtronic is inspired by many arcade shooters of the 90's. Some classic examples were In the Hunt (1993), Metal Slug (1996) and Parodius Da! (1990).

In the Hunt

Metal Slug

Parodius Da!

As a former player of the games mentioned earlier, the idea is to evoke the feeling of the horizontal shooters. Player control will be limited to four directions and shooting on a linear level.

The only difference that might be amiss from the gameplay feature is the buff/boost system, collectibles scattered in the level that can give temporary advantages to the player. Figuring them out how to implement in the game might be difficult, and at the moment not the utmost priority.

Plot

The player is Judy Gearwrench, a tech genius who has built her own submarine. Her goal is to find Atlantis and its' treasures before her millionaire competitor, Max Steele does. The antagonist uses robotic enemies to stop the player from reaching her goal, but there will be also living enemies that try to stop our heroine. The player needs to get deeper with each level where she'll encounter different enemies and obstacles. At the last level (The Abyss) the player will fight with the millionaire's personal giant robot. It turns out that the antagonist is actually a guardian of Atlantis and wants to protect it from everyone else. Once the heroine saves him from drowning, they agree that in exchange for some treasure she will keep Atlantis' existence a secret.

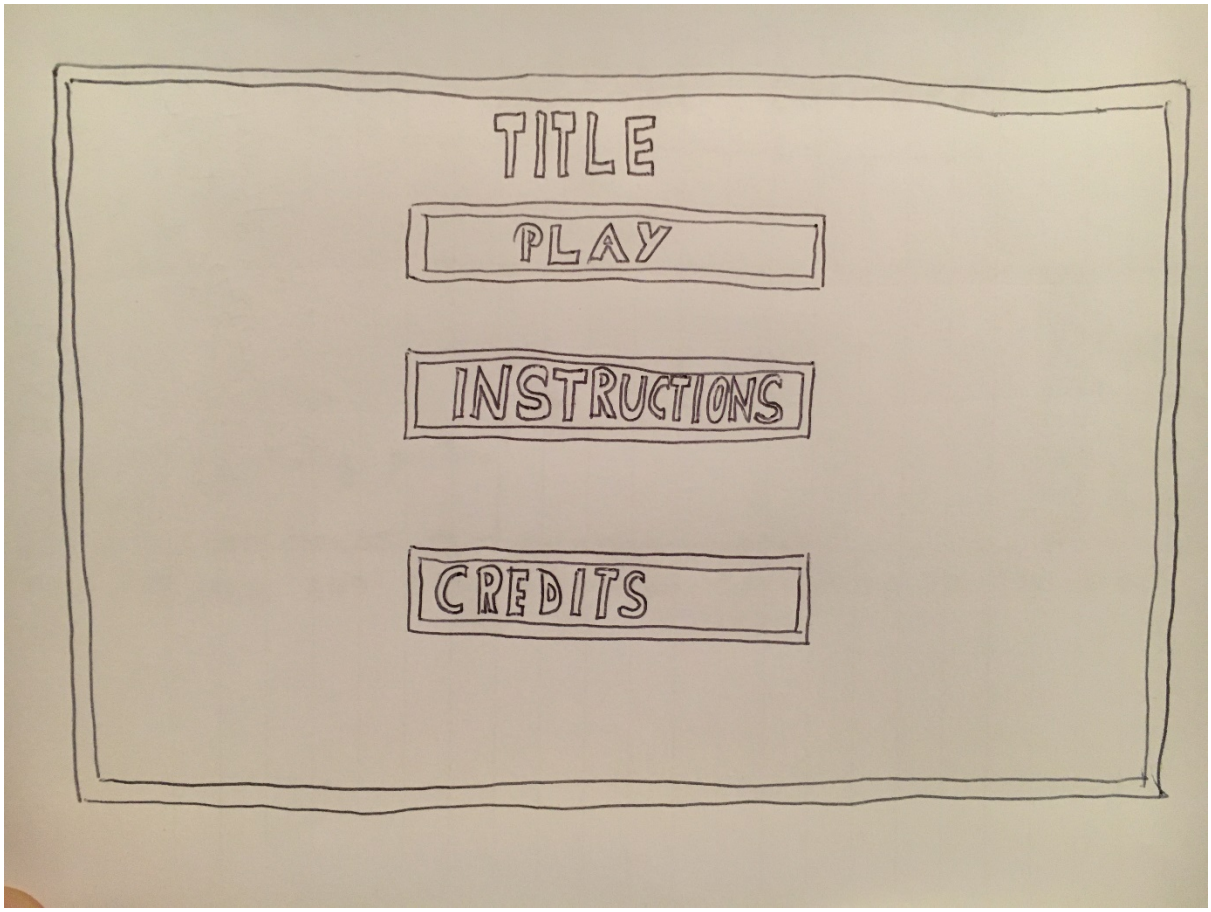
Gameplay

By concept the player is supposed to control the submarine in all 4 directions and fire torpedoes to destroy enemies and environmental objects. The goal is to reach from the starting position to the finish, while collecting treasures, which will be displayed in the UI. Treasures will be purely for displaying score, having an upgrade/purchase system at the moment is not planned.

During the course of the levels the player will not be able to backtrack the level. The background should be seamlessly repeating. The player can either destroy (recommended) or avoid enemies, harmful environmental objects and projectiles. It is expected from the players to get used to the controls, and to position themselves properly in later levels to avoid getting destroyed by the enemies.

Game Interface Design

The game's menu should contain three functional buttons: Play, Instructions, Credits. Within the instructions the players will be briefed about the gameplay, and movement keys will be displayed. Credits will display the creators of the game.



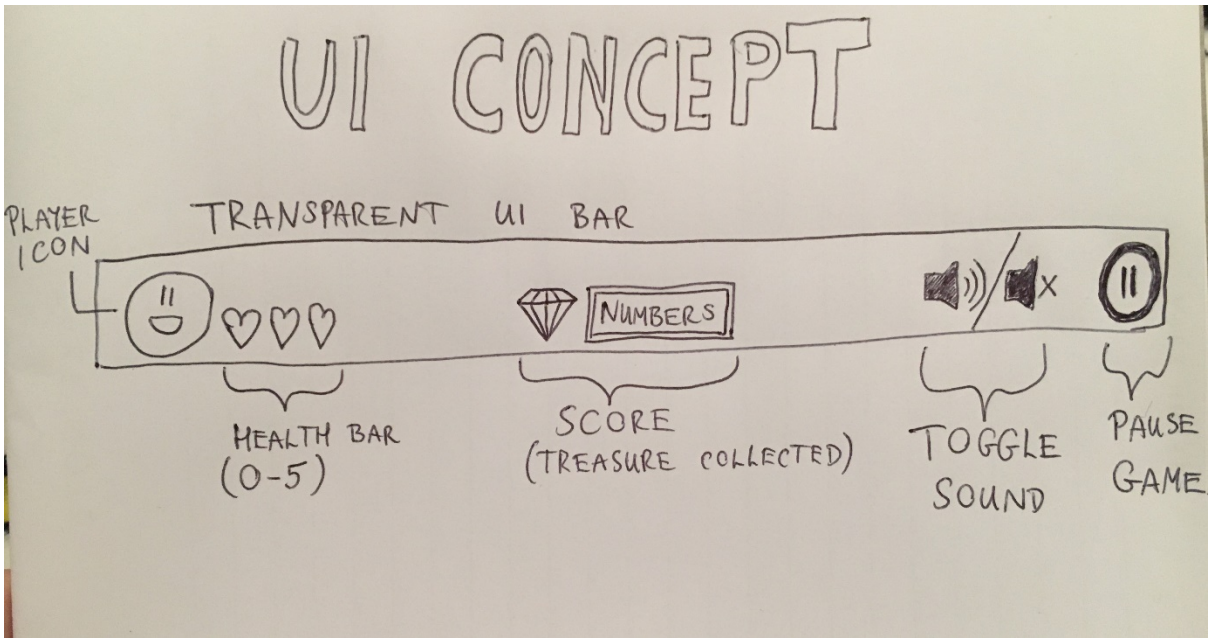
Main Menu Sketch

Key Bindings:

Movement	Shoot	Pause Game	Mute Game
W,A,S,D	Space	P	M

The in-game interface is planned to be limited to display health and amount of treasure collected. The health will be displayed with heart icons, which will increase (upon colliding with a heart pickup object) and decrease (colliding with enemies, projectiles and solid environmental objects.

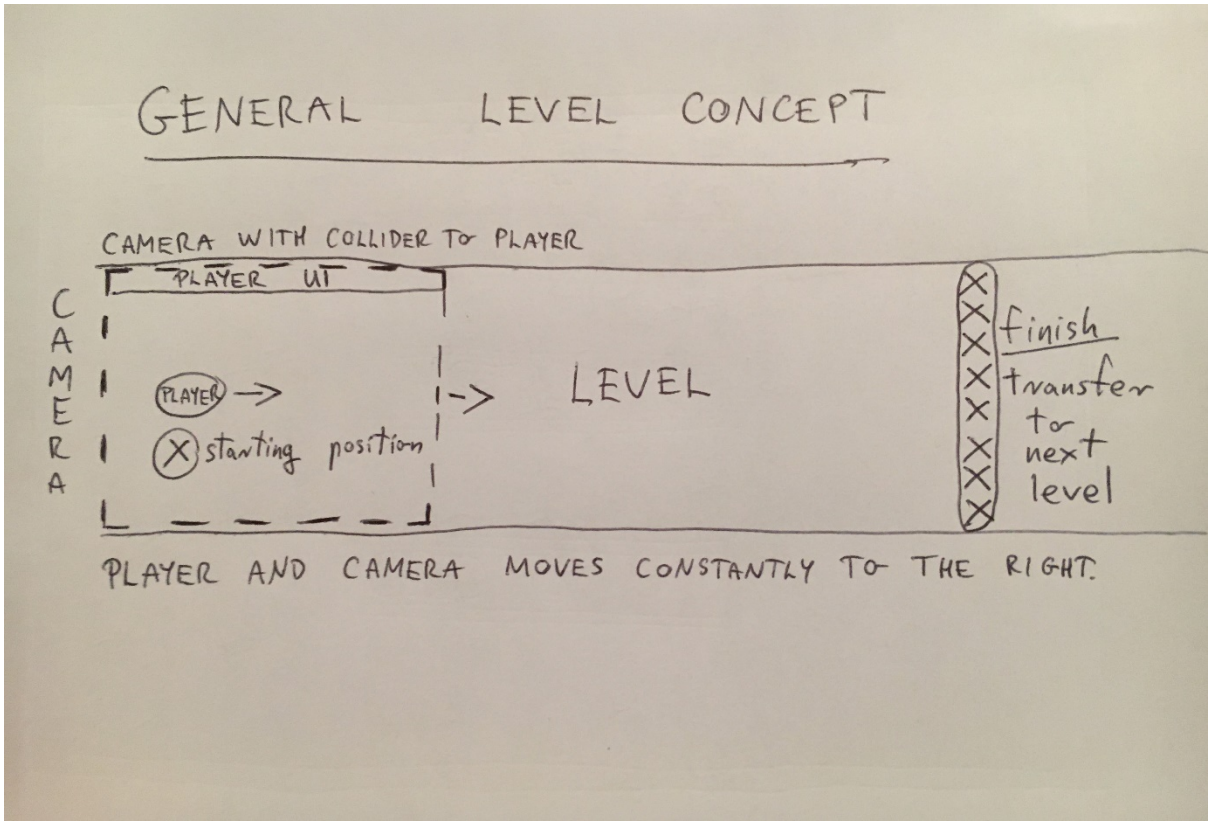
We're also planning to implement a mute button to disable sounds and music, and a pause button in case the player needs to stop mid-game. The UI bar should be transparent and cover the upper 10% of the screen.



Player UI sketch

Game Environment/ Level Design

We're planning to set up multiple levels during the game, with each level representing a different depth of the sea. The levels are aimed to be linear, so in case the players lose, they can remember the same obstacles on their next try.



Levels:

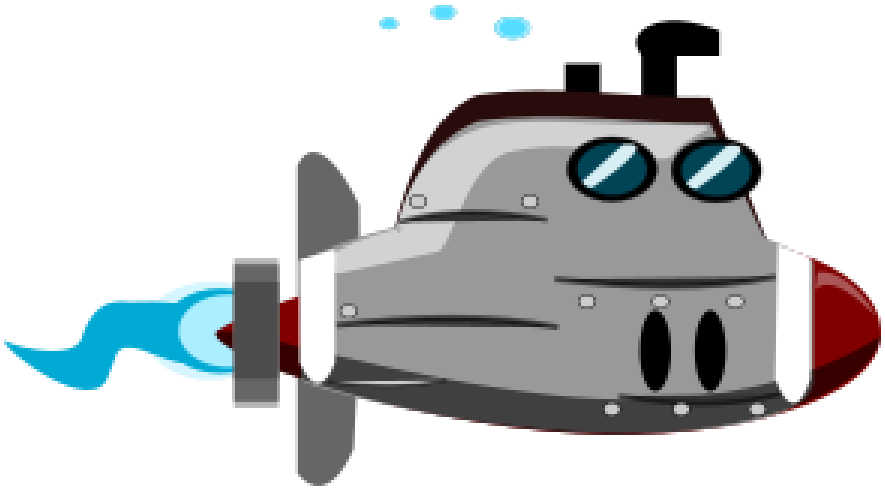
- Sunny Shores: In this level we can see the sea surface, the player will need to dodge bombs dropping from ships and simple horizontally moving enemies.
- Rocky Trench: Sunlight is still present, the player will need to navigate through rocks and caves, while dodging cliffs and falling objects. A new shooting enemy will appear during the level.
- Glowing Caverns: A crystallic cavern, in addition to the previous threats, new enemies will appear that can come from the left or right side of the screen.
- Midnight falls: A very dark biome, illuminating enemies will appear that will explode into projectiles upon death.

- The Abyss: Pitch black level which will contain a boss fight in addition to the previous types of enemies. The boss will be a robotic enemy that has a considerable amount of health, shoots several projectiles at the same time, changes lanes and moves together with the camera until himself or the player dies.

Characters:

The Heroine, Judy Gearwrench

The Antagonist, Max Steele

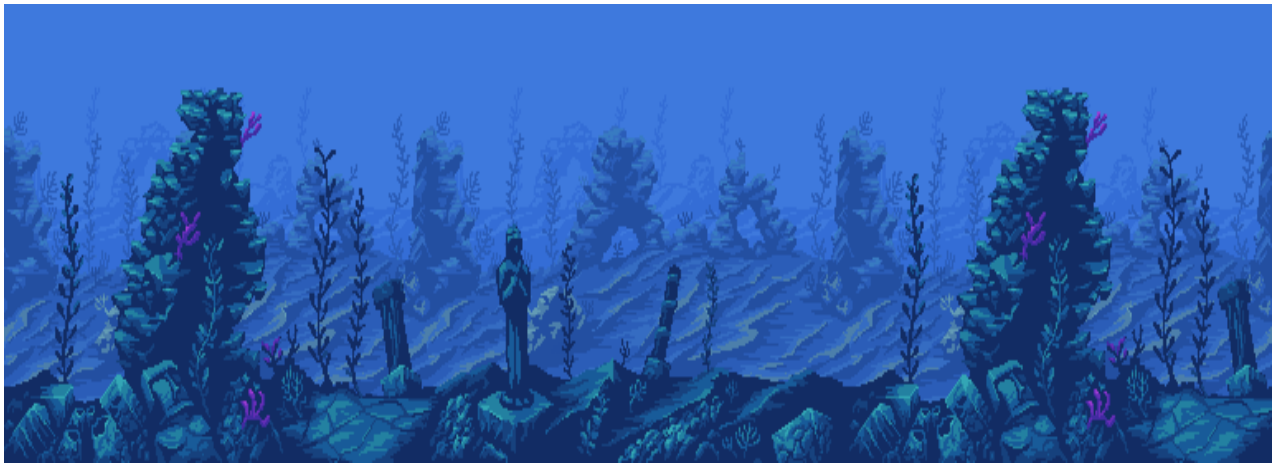


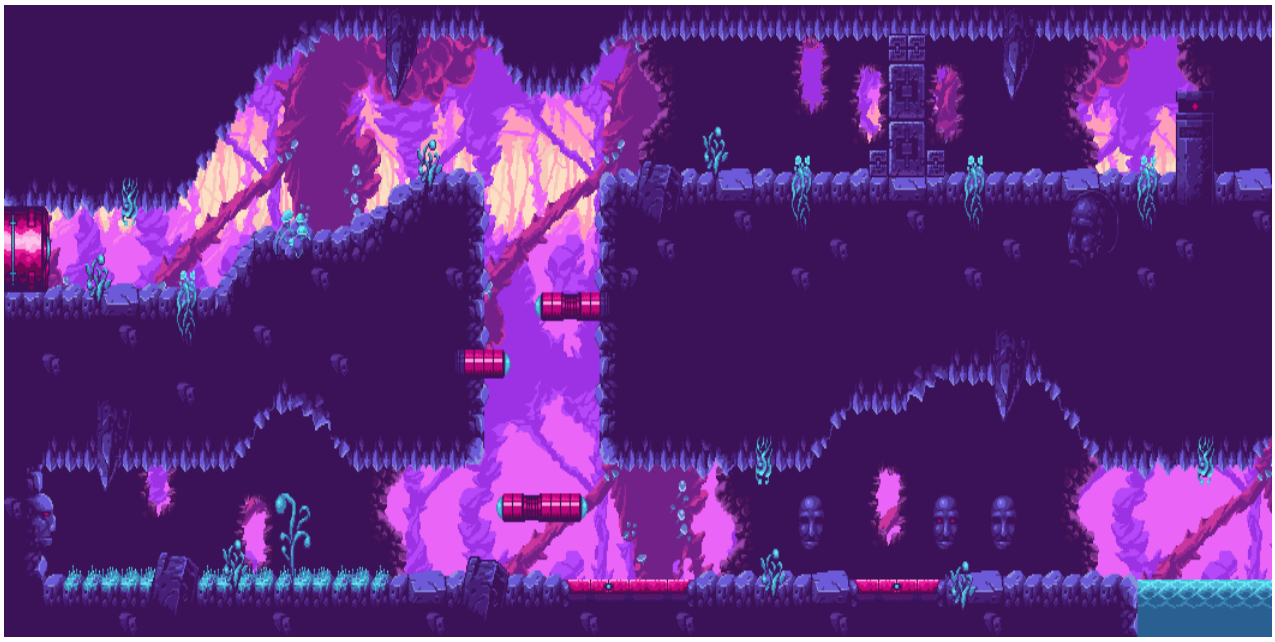
The player's Submarine

Enemy sprites:

Environment:

Background:





Tiles:

For the environmental design we aimed to use pixel art. Having worked with Ansimuz' assets in the past we decided to use it once again. And although during the development process we might try to create some tiles and assets of our own, these premade assets would give a solid base to our game.

Game Implementation

Game Features

Player control: As mentioned before the player will be able to navigate the scene until the camera borders. Shooting will be necessary to make a safe path through the enemies. Shooting frequency will be limited to one projectile per second. Keeping the shoot key down will make the player shoot continuously until the key is released.

Health system: The player's health will lower upon colliding with obstacles. Upon taking damage the player will be invulnerable for a couple of seconds. Colliding with health pickups will increase it by one. Enemies by type will have different health amount. Projectiles will only be destroyed if they collide with mesh colliders (camera bounds, solid objects or the player).

Camera: The camera and the player will be constantly moving slowly from left to right. The edges of the camera will have a collision box that will prevent the player to move outside the camera view.

Audio: A looping music should play throughout the levels. Certain events (shooting, death) should trigger audio.

Enemy AI: different types of enemies will spawn and despawn on each level. Their movement and combat behaviour will vary for each type. Enemies will have a collider, that will affect them if they interact with the player or with certain projectiles. Enemies that surpass the border of the camera should despawn.

Boss AI: The boss AI will be more advanced than the previous enemies. He will shoot several projectiles simultaneously, and frequently change lanes vertically to make it more difficult to the player to damage him. The boss will move

together with the camera which means that the level ends when either the boss or the player dies.

Gameplay & Player Mechanics

The player will be placed at the beginning of the level where it will move together with the camera until they reach a certain collider. Upon colliding the player will be transported to the next scene. In case the player dies the scene will restart from the beginning.

Upon defeating the boss at the last scene the player will be transported to a static end scene which will display the amount of treasure collected throughout the game, and an interactive button that will redirect the player to the Main Menu.

Project Management

For the creation of our game we set up a GitHub Repository for version control. Team Discussion were ongoing through Discord.

Regarding the roles Gabor took the responsibility of the website and game design, writing the initial documentation, and to create the levels within Phaser.

Mohammed took the leading role in creating the game's website, parts of the documentation, and to set up the base of the game, player control, enemies and scene change within Phaser.

Technical Design

The game was developed using the Phaser 3 open source framework for the web. The website on which it is being hosted on is created using Bootstrap, HTML5, CSS and JavaScript. The current stable version (v. 3.24.1 Rem) was used in order to utilise the tools and platform offered, and to bring the game to life. The website has 4 pages: 1 of which is for the game, 2 for the design and 1 about the developers.

Software

In order to create the website, an IDE (Integrated Development Environment) had to be used. We decided to go with WebStorm by JetBrains as it provides the developer with everything they need in order to write HTML, CSS and JavaScript code. Everything works straight out of the box and it provides the user with an intelligent IDE. There is easy JS debugging and code inspection, and start-up is fairly quick when compared with other text editors like VS Code.

The Bootstrap framework was used in order to simplify and speed up the process of creating the website on which Subtronic is to be hosted on. It provided the tools for a responsive and robust website, which is compatible with all modern browsers (Chrome, Firefox, Safari, Edge and Opera).

Phaser 3 is used to create Subtronic. The supported features on Phaser 3 include:

- Physics
- Animation
- Particles
- Camera
- Sprites
- Sound

Being a game side-scrolling shooter game, Subtronic will rely heavily on utilising these features in order to make it the best version it can be, and to fully provide a fun experience for the user.

Version control was done using GitHub. Gabor created the repository in which all files throughout development were routinely shared and updated.

Hardware

To run the game, the user would require a PC with a decent internet connection. The PC would need to have a web browser which supports HTML5 pages, which almost all PC's do nowadays. Speakers would be required in order for the audio to play through. Although generally speaking, games developed using Phaser for the web should not really cause any issues, especially for nowadays PC's which come with quite a lot of power. Ideally, any computer with a decent amount of processing power, enough RAM, and good graphics card is able to run the game and view the website without any problems.

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