S.O.D.A. - Technical Document

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Introduction

This document serves as a detailed overview of the Technical aspects of Final-Game-Group-2 with members: Mikhail Govind, Jean-Francois Retief and Malakai Braam.

1. Overview

The team has decided to make a horror game that features different enemy types that react to different stimuli (similar to enemies in the game: The Last Of Us [6]) as well as resource management systems similar to those found in various Five Nights At Freddy's games[5].

2. Prototype Objectives and Requirements

We intended to have at least four enemy types.
We intended to have the following resources to manage in the game (all of which interact in some way with the various enemy types:

- Power
- Stamina
- Noise
- Visibility

We intended to have the following as well:

- Flashlight mechanic
- Player goal: escape the building
- 3D environment
- 2D enemies

3. Technologies and Methodologies Used

3.1. Hardware Used

Dell G15 5511 Laptops with an Intel® Core™ i7-11800H (11th Gen) processor and 16GB RAM

3.2. Software Frameworks Used

- Unity - Editor Version: 2020.3.30f1
- Github
- Discord
- Whatsapp
- Google Docs

3.3. Additional Templates and Resources Used

- Unity First Person Template (to provide the basic First Person Character controller, compatible with slopes and stairs)
- Visual Assets used:
    - From Sketchfab.com [2]
    - Generator Trailer
    - Hospital Doors Double Swing
    - Elevator
    - Beer Bottle
    - Coffee Cup
    - Key with Tag
    - Messenger Bag
    - Desk 3D
    - Flat Screen Television
    - Free Wall Outlet
    - Laptop Notebook
    - Light Fixture
- Sound Assets used:
    - From Freesound.com [3]
    - Glitch 1
    - Glitch 2
    - Growl Clean
    - Monster
    - Monster Hiss
    - Dark Ambience
    - Creepy Background noise
    - Haunted Hall
    - Dementia
    - Attack
    - Footsteps on wood
    - Running Hard Surface
        - From Pixabay.com [8]
    - Phone Notification
    - Dark Whispering Ambience
    - Generator
    - Electric Hum
        - From OpenGameArt.org [9]
    - 16 Button Clicks
    - Picked Coin Echo
    - Door Open/ Door Close
    - Key Pickup
    - Point Bell
    - Zippo Click Sound

- Textures/Materials
    - From FreePBR.com [4]
    - Bark

- Fibrous plaster
- Concrete
- Bricks mortar
- Gross Dirty Tiles

4. Feature Documentation

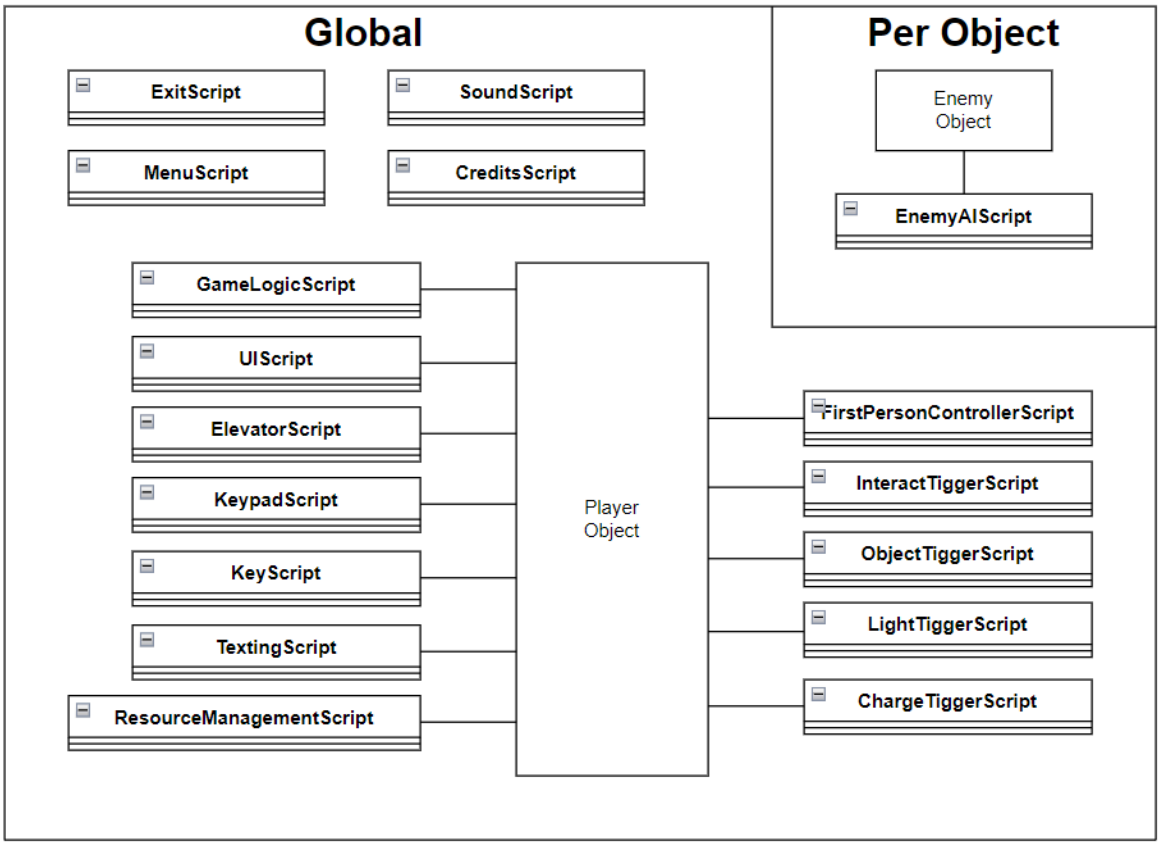

Figure 1: Simplified UML Diagram, describing Game Systems in terms of objects and scripts (due to amount of scripts, functions and variables were ignored for this Figure)

4.1. Enemy AI

4.1.1. Enemy 1 “Soundless Fiend”

Figure 2: Image of Enemy 1

This enemy is **deaf** so the player can be as loud as they want when in close proximity.
This enemy’s strength is **sight**, it has the greatest view radius of any enemy in the game.
It can also tell if the player is looking at it, and will attack the player from even further away if the player looks at it. Its view radius is also increased if the player has a *high stamina value*.

4.1.2. Enemy 2 “Frigid Spectre”

Figure 3: Image of Enemy 2

This enemy **freezes when player looks at it**, similar to a Weeping Angel [7]
Its view radius is increased when the player’s power / stamina values are LOW.

4.1.3. Enemy 3 “Eyeless Horror”

Figure 4: Image of Enemy 3

This enemy is **blind** (i.e. won’t react to visibility-level or flashlight)
This enemy’s strength is **hearing,** it has the greatest hearing radius and is sensitive to the noise-level of the player and will move to the nearest source of sound (player or environment).

4.1.4. Enemy 4 “Shadow Watcher”

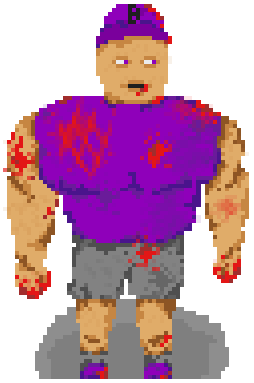

Figure 5: Image of Enemy 4

This enemy is more active at lower player visibility-levels, i.e., it will hunt you if you stick to the shadows. This enemy is mainly to stop players from following specific playstyles when dealing with multiple enemies at the same time. Other than that, this enemy has average hearing and view radii.

4.2. UI

4.2.1. Menu

There is a main menu that tells the player the controls and gives the option to start the game or view the credits.

Figure 6: Main Menu

4.2.2. HUD elements

The Heads-Up Display for the player is contained entirely within the bottom right corner of the screen in the form of a **phone-screen**. The diegetic nature of the HUD helps to ground the player in the game's reality, so that the horror aspects can take greater effect.

4.2.2.1 Health Management App

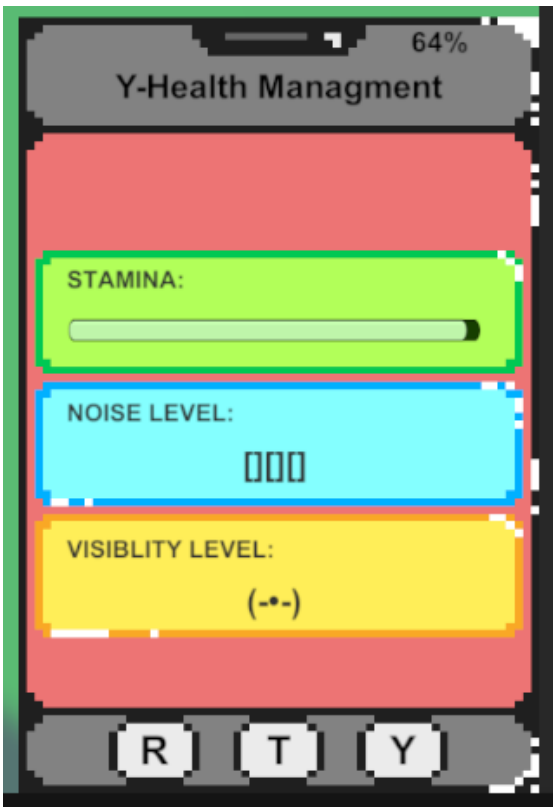

Figure 7: Health App

This app allows players to keep track of their stamina value, as well as their noise and visibility level (which will be discussed later). This app contains the majority of the visual indicators of the various resources the player has to keep track of and thus is probably the app the player will use the most.

4.2.2.2 Texting App

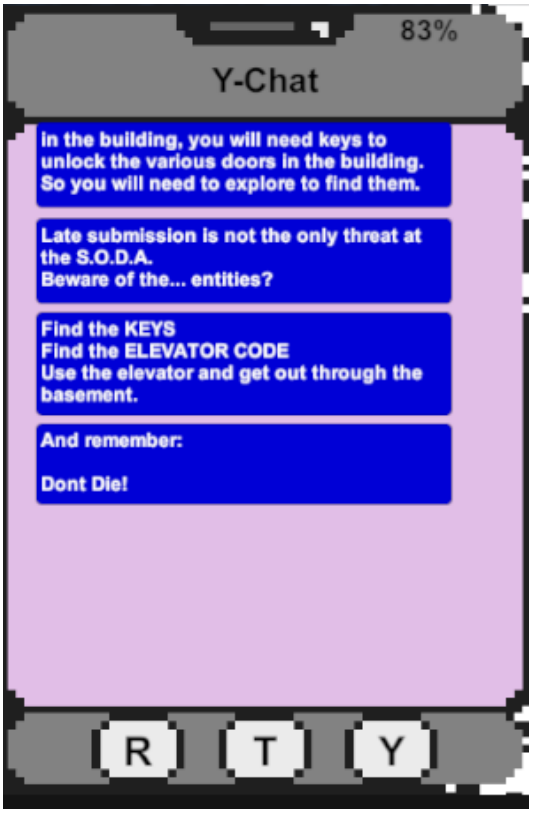

Figure 8: Texting App

This app serves to provide hints, tutorials and other information for the player to help them complete the game.
This app was also added for narrative reasons, to make the phone feel more like a diegetic item, rather than a UI element.

4.2.2.3 Power Management App

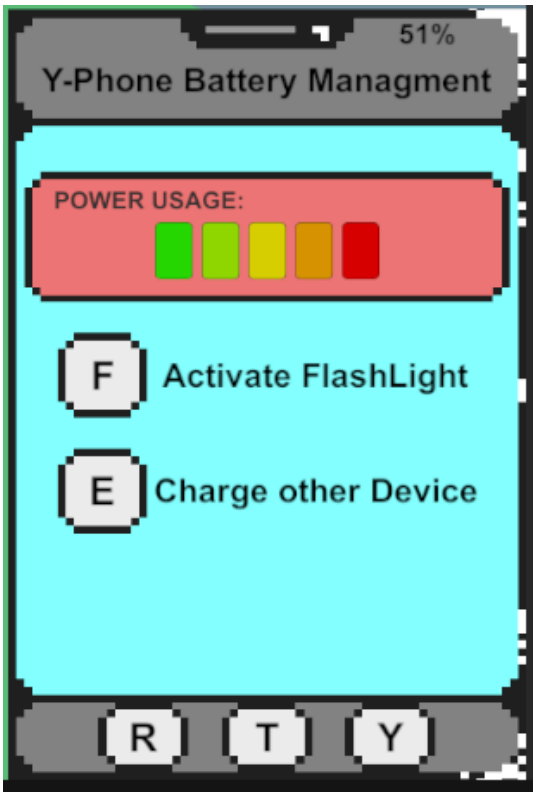

Figure 9: Battery Usage App

While the player can always see the amount of power left on their phone while in any app, this app will display the current usage so that the player can allocate their power more responsibly.

This app contains button-hints for the flashlight and charging other devices' mechanics, but it serves to have another visual indicator separate from the rest. This indicator is on a separate app, for narrative and mechanical reasons. The narrative reason is because it didn't make sense for the phone power usage to be on the "Health" app. The mechanical reason is we want the player to always have to divert their attention from the game-world and be distracted by their phone (so that enemies can sneak up on them). Having to switch apps to view different usage bars is a good way to keep the player's attention on the phone.

4.3. Resource Management

4.3.1. Power

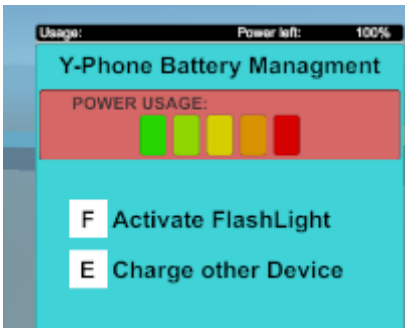

Figure 10: Power System (old version of UI)

This system is inspired by the power system in Five Nights At Freddy's[5], and features a similar power-usage indicator.
The power the player has left is displayed at the corner of the phone screen

4.3.2. Stamina

Figure 11: Stamina Bar

It is just a regular stamina bar that decreases when the player runs, but also when the player walks. When the player runs out of stamina they can only move very slowly. In order to regain stamina, the player must stand still (thus forcing the player to look for safe areas to be able to stop without being attacked). Thus, when stamina=0 there is a tradeoff between slow movement and stamina recharge. Movement itself is a resource.

4.3.3. Noise

Figure 12: Noise-Meter

Actions like walking, running and interacting with environment elements (like generators) increases the "noise-level". The higher this noise-level, the further away sound-sensitive enemies can detect the player from.

4.3.4. Visibility

Figure 13: Visibility-Meter

Lighting is not just for visuals in this game, it also affects the player's "visibility-level". Using the flashlight or stepping into light increases this visibility-level. The higher the visibility-level, the further away sight-sensitive enemies can detect the player from.

4.4. Sound Design

Since this game is a horror game, sound design is especially important to capture the correct atmosphere.

There are quite a bit of sounds that serve no other purpose other than ambience but also many that are diegetic to the game world which allows the player to become more immersed.

The sounds sourced for this project are mentioned in the section:
3.3. Additional Templates and Resources Used

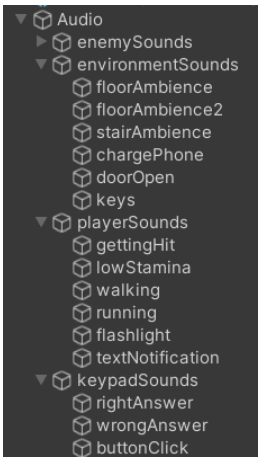

Figure 14: Audio Sources

4.5. Visual Design

4.5.1. Enemies

While most of the game's visuals are 3D environments, it was decided to make the visuals of the enemies 2D sprites. Not only did this save time when making the enemy visuals, it also contributed to the theme of games coming to life in a Digital Arts university building.

4.5.2. Lighting

The game is mostly dark, because it is a horror game and because light is a resource that affects how certain enemies can detect the player.

There needed to be a clear distinction between being in light and not so that the player knows whether certain enemies can easily see them.

The scenes being dark also gave us the opportunity to add a flashlight mechanic (a staple of the horror game genre). The flashlight also affects enemies' behaviour.

4.5.3. Environment

The environment comprises 4 main building levels and a basement level. Each floor looks different to the last, with each level being on one floor.

The environment makes use of textures and materials such as bricks and concrete to create a similar architecture style and look to the WIts Digital Arts Building, however the materials used are purposely dilapidated and run-down aesthetically to aid the visual stimulus of an empty and scary building.

4.6. Level Design

As mentioned above, the game takes place in a Digital Arts university building where the player must find a way to get out of the building. To see the full layouts, see the Game Design Document [1].

Most of the interactions with the level itself is facilitated by triggers placed throughout the gamespace.

Figure 15: Various Triggers used

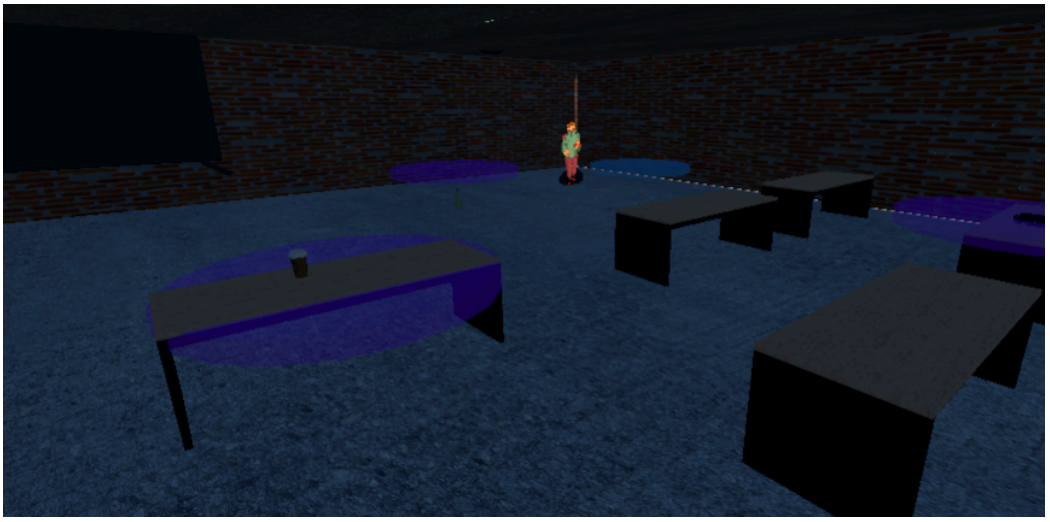

Figure 16: Image displaying Triggers used for interactables

4.6.1. Charge & Interact Triggers

Charge Triggers INCREASES the phone's battery life (i.e. increases the value: powerLeft).

Interact Triggers DECREASES the phone's battery life (i.e. increases the drain rate of the powerLeft value) and INCREASES the player's noise level (draws in enemies from further away).

4.6.2. Key & Object Triggers

Key Tiggers give the player the button prompt "Press Q to pick up key". If they press Q while in the trigger, the key GameObject disappears and the boolean HasKeyX becomes true.

Object Triggers allow the player to view certain objects up close to find a code or a key. These triggers also give the "Press Q" button prompt and for a certain object (a bottle with a key in it) a "Press B to break the bottle" prompt will also appear. If the player presses Q, a panel with pixel art of the objects appears. If the player presses B, HasKey3 gets set to true and new art for the broken bottle shows up.

4.6.3. Door & Elevator Triggers

Door triggers simply checks if the player has the corresponding key for that certain door. If HasKeyX is true, the player gets a "Press Q to open door" prompt and they can press it to make the DoorX GameObject disappear. If HasKeyX is false, they simply get the text: "Get the key, Stupid".

Elevator Triggers simply brings up the keypad and gives the player the option to type in the code (which can be found in the building, digit by digit).

Figure 17: Keypad

4.6.4. Light Triggers

Light triggers simply INCREASES the player’s visibility level. So sight sensitive enemies will see the player from further away.

4.6.5. Text Triggers

Text Triggers simply changes the active panel in the texting app, depending on where the player is. This is the main source of narrative and hints to the player.

References

[1] M. Govind, J-F. Retief, M. Braam, 25 Aug 2023, “S.O.D.A. - Game Design Document”, Unpublished Internal Development Document

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[6] Fandom - THE LAST OF US WIKI, “The Last of Us series”, Available Online at: https://thelastofus.fandom.com/wiki/Clicker (last accessed: 27/10/2023)

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