Fire Ed. Studio

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Technical / Design Documentation

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# Game Overview

Fire Training is a first-person shooter style game (FPS) to help train people in the proper use of three different types of fire extinguishers, Players have the opportunity to test out CO2, ABE and water extinguishers on different fires. The game will be deployed to both windows desktop and Android phone

## Game Concept

The focus of this game is to educate people on the different type of fire extinguishers and their appropriate uses. The user must understand and use three different types of extinguishers, CO2, ABE and water as well as the types of fires which are appropriate to extinguish with that extinguisher. The game is broken down into two levels.

In the first level the player will be presented with a simplified area, the extinguishers and be given a short explanation about which fires are appropriate for it to be used upon they will then be given the opportunity to test the extinguishers.

In the second level the users will move through several small warehouse style rooms and must extinguish the fires in each room before moving on to the next, the first three practice rooms only have a single type of fires while the final room contains fires of different types.

## Game Flow

Once the application starts players find themselves with a menu to start the game which drops them into the first game area. Once they have completed the learning objective – understand fire extinguishers – they then have to practically demonstrate the skills needed – identify the type of fire – actively put it out with the right type of extinguisher before they move on to the next area



Game State Flow Diagram

# Game Architecture

## Comparisons between Products

### Unity and Monogame

Unity has a lot more structures to use such as the canvas subsystem which controls the user interface and an inbuilt particle system which is an important part of our application. Monogame has gives programmers a lot more control over the program however we don’t need that level of control over the program.

### GIMP and Photoshop

Photoshop would have been nice to use because it has a lot more features available being easily exportable to other application and having better image editing tools to use, however no member of the team had access to this software and getting it would cost a considerable amount.

### 3DSMax and Blender

3DsMax was chosen as our 3d modelling software of choice because both Sam and Alex had experience and access to the software. Other options included blender for creating and editing the 3d models.

### Github and Subversion

All have members of the team have github accounts, although some members have experience with subversion, github was chosen because it allowed the team to start coding quickly.

## Game Loop

Unity keeps track of the game loop, it has four main functions where it does this, two to control when the script is loaded Start() and Awake(), and two update functions which are called multiple times over the life of the game Update() and FixedUpdate(). The Awake function is called as soon as an object is instantiated, the Start function is called immediately before the first update function. The Update function does the major heavy lifting for a program it is called once per frame, this is different from over time since its bound to the frame if one frame takes longer to load then the time will be thrown out though so if a fixed timeloop is needed it is better to be in the FixedUpdate function.

## User Input

User input is through two methods depending upon the users platform, if the platform is windows desktop, input is through keyboard, and mouse and Android phone is through xbox 360 controller.

# Game Media

## Models

The following list is all the models that have been developed for use in the project

* Barrel.obj – a barrel object which will be on fire in the game
* Pallet.obj – a wooden pallet object which will be on fire in the game
* CO2\_Extinguisher.obj – an object which will be on the walls which the player can pick up
* Water\_Extinguisher.obj – an object which will be on the walls which the player can pick up
* ABE\_Extinguisher.obj – an object which will be on the walls which the player can pick up
* CO2\_FPS.obj – A first person object which is attached to the camera to give the illusion that the particles are firing from it
* Water\_FPS.obj – A first person object which is attached to the camera to give the illusion that the particles are firing from it
* ABE\_FPS.obj – A first person object which is attached to the camera to give the illusion that the particles are firing from it
* Table-tex.obj – a table object which will be on fire in the game
* Fryer.obj – a table object which will be on fire in the game
* Fan.fbx – an animated fan which will be on fire in the game
* Helper\_idle.fbx – an animated person who watches the player in the practical level

Additional models have been used from the Unity Asset Store all of which is listed in section 3.3 external assets

## Audio

The game contains audio prompts to advise the player what to do next.

* GameComplete.Mp3
* Intro(ABE).Mp3
* Intro(CO2).Mp3
* Intro(Congratulations).Mp3
* Intro(repeat).Mp3
* Intro(water).Mp3
* Intro1.Mp3
* Intro2.Mp3
* IntroExit.Mp3
* IntroLvlComplete.Mp3
* PracIntro.Mp3
* RoomCleared.Mp3
* RoomNotCleared.Mp3

Additional audio has been used from an external source which is listed in section 3.3 External Assets

## External Assets

Assets made by sources external to the team are

|  |  |  |  |
| --- | --- | --- | --- |
| Asset Name | Publisher | Downloaded | Developer website |
| Modular Warehouse | Adamations | https://www.assetstore.unity3d.com/en/#!/content/3439 | http://www.adamations.co.uk/ |
| Unity Particle Pack | Unity Technologies | https://www.assetstore.unity3d.com/en/#!/content/73777 | https://unity3d.com/ |
| Water FX Pack | Unity Technologies | https://www.assetstore.unity3d.com/en/#!/content/19248 | https://unity3d.com/ |
| electrical box.wav | keweldog | http://freesound.org/people/keweldog/sounds/181131/ | http://freesound.org/people/keweldog/ |
| footstep-concrete.wav | swuing | http://freesound.org/people/swuing/sounds/38873/ | http://freesound.org/people/swuing/ |
| Fireburning.wav | Jagadamba | http://freesound.org/people/Jagadamba/sounds/256419/ | http://freesound.org/people/Jagadamba/ |

# Testing Plan

|  |  |  |
| --- | --- | --- |
| Test Number | Test Details | Test Outcome |
| 1 | Particle collision testing – fire goes out when hit by particle | True. |
| 2 | Doors only open when all fires in that room are extinguished | True – players must extinguish a set number of fires before moving on to the next room |
| 3 | Sounds play when players approach the flammable objects in the tutorial level | True – sounds override each other though which can cause confusion |
| 4 | When all fires are extinguished in the practical level victory text is display | True |
| 5 | When time runs out in the practical level failure dialog box is opened | True |
| 6 | When player enters a new room they are allowed to go back to a previous checkpoint located in the hallway prior to the room | True |
| 7 |  |  |

# Fire Ed Studios

## Members/Contact Details

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| --- | --- | --- |
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