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SP3 Team 5 TDD

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# **Project Overview**

## **Game Concept**

The game will be a 3D Horror Adventure FPS game. Its progression with be linear with transitions between each level. There is a main hub that players can visit to shop for items.  
  
In each level there is wandering / hidden ghosts that the player can catch. The player will have limited inventory space to keep the captured ghost. The spaces can be increase by purchasing upgrades in the shop. Ghosts can be turned into ectoplasm (money) at the main hub, each ghost worth different value. Players can only capture weaken / defeated ghosts.  
  
By capturing a set amount of ghosts, the player will encounter the boss, the boss will run away after reaching a HP threshold and will run away. It can only be truly defeated and captured at the last level.

The player will not have HP, but instead will have a “Fear” factor. As fear rises, the player will have decreased vision, slower move speed and if it rises too high the player will faint and be teleported back to the main hub.

## **System Requirements**

OS: Windows 7/8/10  
Minimum Hardware:

* 1050 MHz Processor
* 256MB RAM
* 32MB onboard video ram
* 100MB Hard-Drive space available.

Recommended Hardware:

* 1.8 GHz Processor
* 512MB RAM
* 96MB onboard video ram
* 100MB Hard-Drive space available.

## **Third Party Library**

The game will use external libraries such as **irrklang** to use as a sound engine

# **Game Play**

## **Physics**

There are throw-able objects that are affected by gravity

## **Projectiles**

There only projectile in the game is the player’s bullets. These will not be affected by physics and will simply travel along a straight line until they collide with something.

## **Collision**

The game uses barycentric collision for terrain collision, AABB collision for OBJs , AABB tree for boss and Distance check for billboard sprites and objects.

## **Player actions**

The player will take on the body of a Ghost Hunter from the Church of Harambe. And the Ghost Hunter is capable of the following actions:

* Walking around in a 3D world
* Looking around his environment
* Sprinting at the cost of stamina
* Interaction with Special objects
* Use weapons (Shoot and reload)
* Capture ghosts
* Access and check inventory
* Use items

## **Victory conditions**

The player wins the game when the Ghost Boss is captured. Each level is repeatable but the Ghost Boss encounter is not.

# **User Interface**

## **Game Menus**

The startup menu will consist of a 2D menu with the following choices:

* “Start Game” – This starts up the game.
* “Instructions” – This opens up the instruction screen.
* “Options” – This opens up the options screen
* “Quit” – This closes the game and application.

## **In-Game Controls**

### **Movement**

Movement will take place with a standard 4-command strafing setup. One command will walk forward, another backwards, one of strafing left, and the last will strafe right. These commands are bounded to:

* W / S / A / D
* UPARROW / DOWNARROW / LEFTARROW / RIGHTARROW

### **Looking around / Aiming**

Looking around and aiming with the weapon uses the mouse. Moving the mouse with pan the camera in the corresponding direction:

* Moving up the mouse will pan the camera upwards.
* Moving down the mouse will pan the camera downwards.
* Moving left with the mouse will pan the camera towards the left.
* Moving right with the mouse will pan the camera towards the right.

### **Weapon control**

The firing / shooting of the weapon will be controlled by the mouse’s left click while the reloading of the weapon will be bind to ‘R’.

### **Shop**

Navigation of the shop and purchasing of items will all be controlled by the mouse.  
Left clicking an item / weapon will select it while left clicking buttons will trigger the action stated on the buttons.

### **Interacting with objects**

Interactions with other objects will be bind to ‘E’.

# **Graphics**

OpenGL 3.0 introduced a deprecation mechanism to simplify future revisions of the API. Certain features, marked as deprecated, could be completely disabled by requesting a forward-compatible context from the windowing system.

## **Features**

Shaders are added and edited to allow the following features:

* Shadows
* Reflections
* Terrain generation
* Fog
* Billboarding
* Cel shading
* Obj loading
* Texture mapping

## **Formats**

* Object file (\*.obj)
* TARGA File (\*.tga)

# **Audio**

irrKlang is a powerful high level API for playing back sound in 3D and 2D applications like games, scientific visualizations and multimedia applications. irrKlang is free for non-commercial use.

## **Features**

The following features are available through the API:

* 2D/3D sound effects
* 2D music with support for compressed file formats
* Control of volume
* Multiple sound effects simultaneously

## **Formats**

irrKlang supports these following formats:

* RIFF WAVE (\*.wav)
* Ogg Vorbis (\*.ogg)
* MPEG-1 Audio Layer 3(\*.mp3)
* Free Lossless Audio Codec (\*.flac)
* Amiga Modules (\*.mod)
* Impulse Tracker (\*.it)
* Scream Tracker 3 (\*.s3d)
* Fast Tracker 2 (\*.xm)

# **Task List**

**MAIN FEATURES**

|  |  |
| --- | --- |
| FEATURE | DONE BY |
| AABB TREE COLLISION | GUANG ZHE |
| MINIMAP | GUANG ZHE |
| SHOOTING GHOST (laser, grenade, gun) | JASON |
| CAPTURING GHOST (vacuum) | JASON |
| 3D SOUND (BGM, SFX) | JIAHAO |
| GUI & INVENTORY | JIAHAO |
| TERRAIN COLLISION | SRI SHAM |
| simple ai [static] | SRI SHAM |
| NIGHT VISION | SRI SHAM |

**SIDE FEATURES**

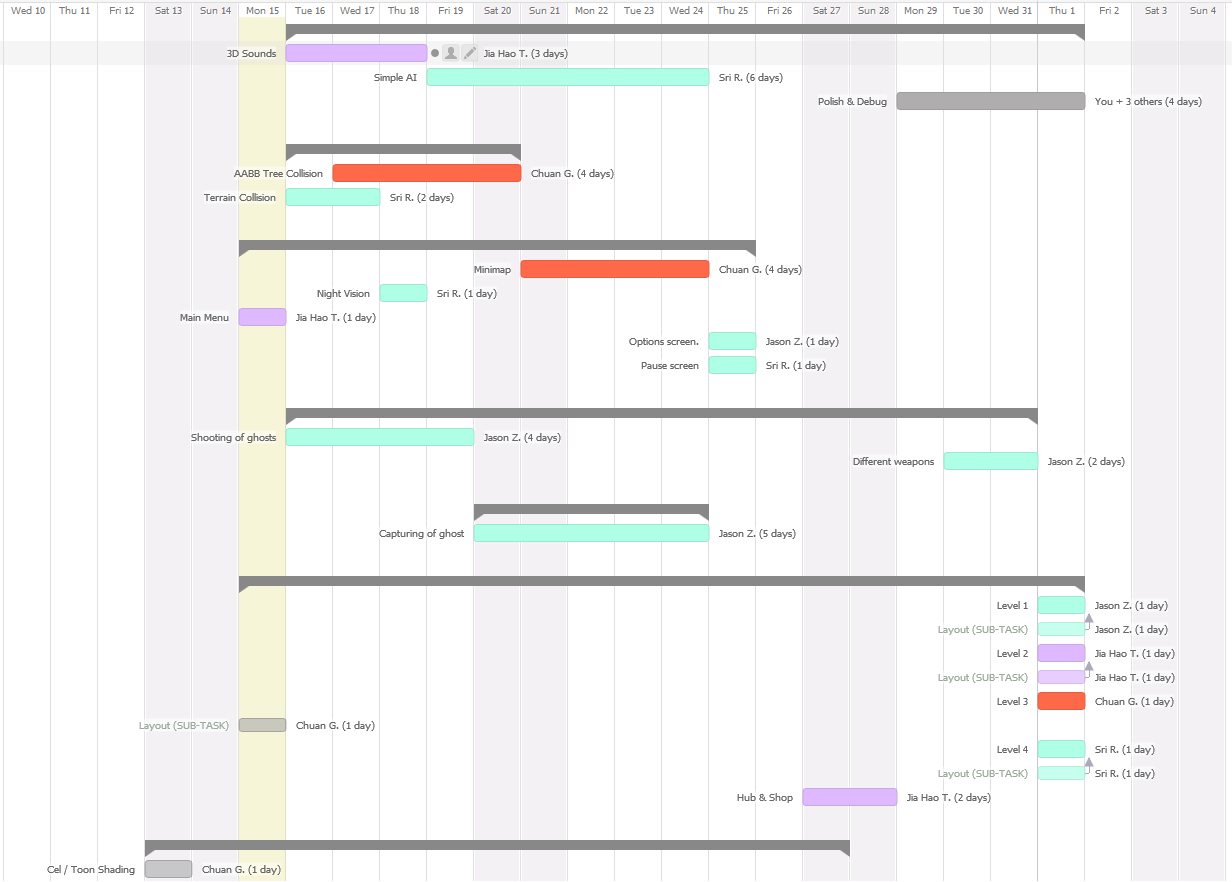
|  |  |
| --- | --- |
| FEATURE | DONE BY |
| SAVE AND LOAD GAME |  |
| SHADOWS (SOFT SHADOW [POISSON 16-SAMPLE]) | GUANG ZHE |
| REFLECTIONS | GUANG ZHE |
| CEL SHADING | GUANG ZHE |
| OPTIONS SCREEN | JASON |
| DIFFERENT WEAPONS | JASON |
| MAIN MENU | JIAHAO |
| INVENTORY INTERFACE | JIAHAO |
| scene transition / HUB | JIAHAO |
| PAUSE SCREEN | SRI SHAM |
| DAY NIGHT CYCLE | SRI SHAM |

**Level layout**

Skyplane : Day & Night;

|  |  |
| --- | --- |
| LEVEL | DONE BYE |
| LEVEL 1 – INDOORS | JASON |
| LEVEL 2 – OUTDOORS | JIAHAO |
| LEVEL 3 – JUNGLE/FOREST | GUANG ZHE |
| LEVEL 4 - GRAVEYARD | SRI SHAM |

# **Timeline / Milestones**



# **Appendices**

The following lists contains the names of all object, textures and sound files used.

## **OBJ**

* ghostBoss.obj
* lamp.obj
* desk.obj
* chair.obj
* grave1.obj

## **Texture**

* Ghost\_1.tga
* Ghost\_2.tga
* Ghost\_3.tga
* ghostBoss.tga
* lamp.tga
* desk.tga
* chair.tga
* tree1.tga
* tree2.tga
* grave1.tga
* grave2.tga

**Sound files**

* **BGM**
  + menu.mp3
  + Scene1.mp3
  + Scene2.mp3
  + Scene3.mp3
  + Scene4.mp3
  + shop.mp3
  + winScene.mp3
  + loseScene.mp3
* **SFX**
  + playerShoot.wav
  + playerCapture.wav
  + playerDie.wav
  + enemyAttack.wav
  + enemyDie.wav
  + ButtonHover.wav
  + Purchase.wav
  + Alarm.wav
  + doorClose.wav
  + Explosion.wav

# **Object Examples & Level Layout**

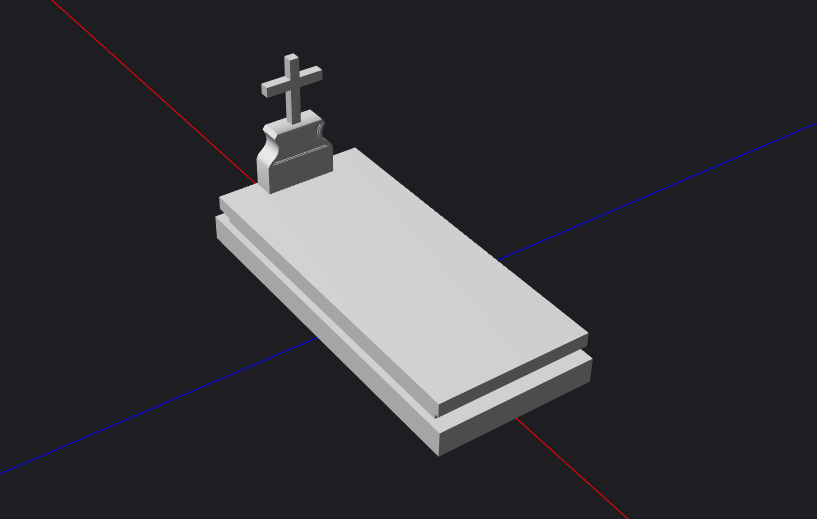
## **Level 1 – Indoors**

Pictures examples (Might not be the exact same as the one used in game)

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## **Level 4 – Graveyard**



## **Ghosts**

