



NIGHTLIGHT STUDIOS

# TECHNICAL DESIGN DOCUMENT

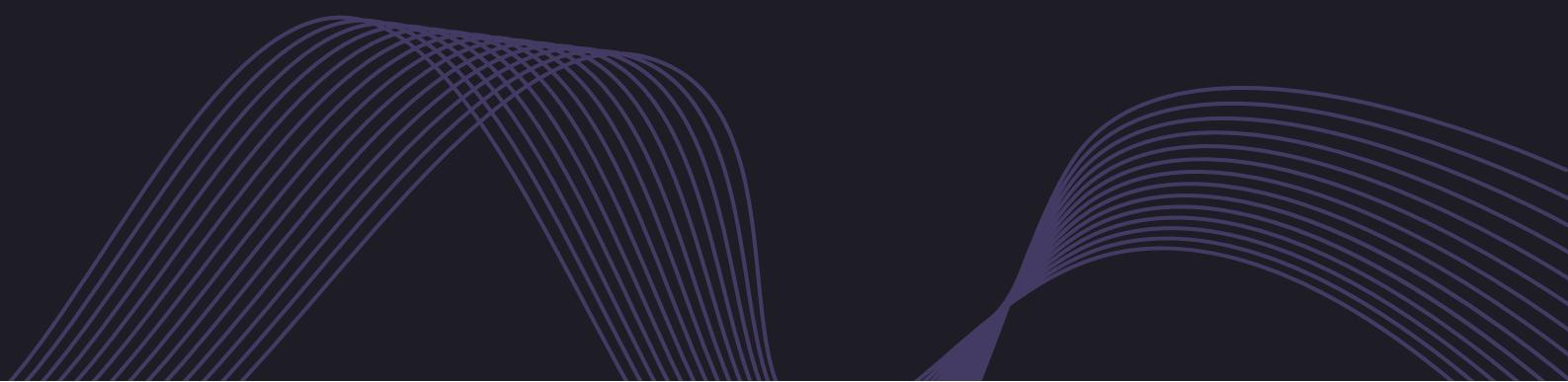
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PENGUIN CRISIS

**INTEGRATED  
PROJECT 2022**

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# **Executive Summary**

## **Game Overview**

Penguin Crisis is a first-person action stealth PC game where the player is a penguin who wakes up to the commotion caused by other penguins. The elder penguin warns the player of humans invading their habitat and the player must put a stop to this. As a penguin, the player must go on secret missions to stop this operation run by humans.

## **Technical Summary**

Penguin Crisis will be developed in approximately 3 weeks by roughly 3 people using the Unity game engine. As for 3d asset creation, we will be utilizing Autodesk Maya 2023 with applications such as Canva, Miro, Adobe XD for prototyping and documentation.

PC, MAC AND LINUX STANDALONE

OS: Windows 10, MAC OS X 10.8+, LINUZ MINT 20.3

Graphic card: At least a Nvidia GTX 1030

# Equipment

## Hardware

Members of the development team will be equipped with windows laptops with dedicated GPUs as the primary hardware platform for game development, asset creation, prototyping and documentation. Additional hardware choices includes computer desktops, iPad, drawing tablets and miscellaneous hardware already owned by the team.

Product	Task	Cost	Quantity	Total
Windows laptop with dedicated GPU	Game development Asset Creation Texture Painting	\$2000	3	\$6000
Value listed are approximations	\$ in SGD		Total:	\$6000

# Software

All the software used in the development of Penguin Crisis will be able to produce high end visuals while still being able to deploy across different platforms. Not all team mates will utilize all the software tools, however, the full library of software tools will be available to everyone on the team.

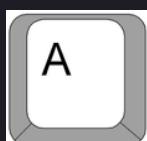
Product	Task	Cost	Quantity	Total
Unity	Game editor/engine	\$1500	3	\$4500
Maya	3D Asset modelling 3D animation	\$1500	3	\$4500
Canva	Documentation	\$210	3	\$610
Adobe Cloud	Prototyping	\$27	3	\$81
Microsoft Office	Slides and meetings	\$108	3	\$324
Miro	Diagrams	\$8	3	\$24

# Game Controls

The player should use WASD to move forward, left, backward, and right respectively. The player can use the mouse to rotate the Point of View and use the left click to use the Melee weapon to hit. The Shift buttons allows the player to sprint in game if they have the stamina to do so. The player can use the letter 'E' to interact with interactable. Lastly, the Spacebar enables the player to Jump.



Move forward



Move left



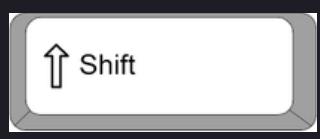
Move back



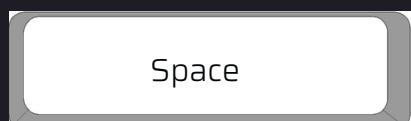
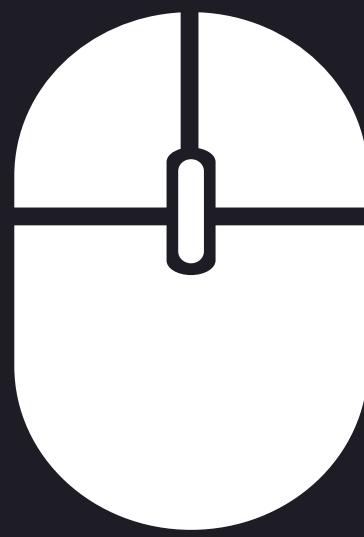
Move right



Interact



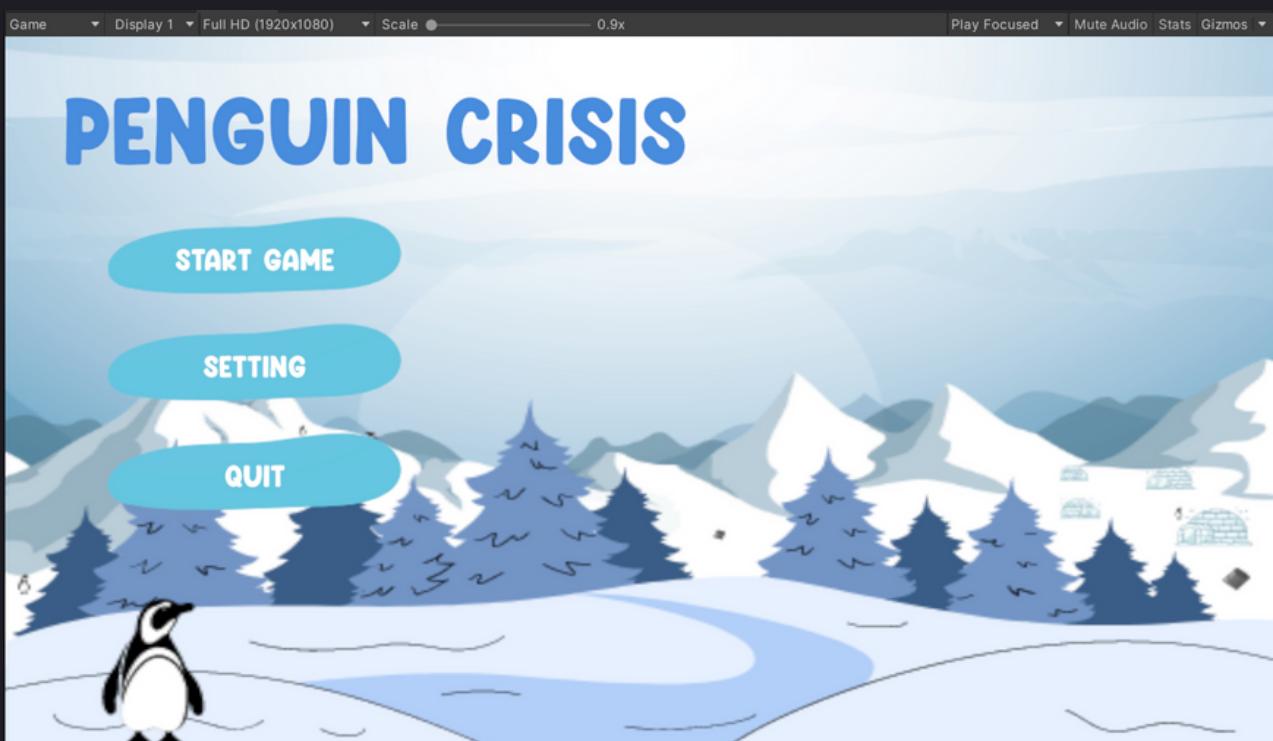
Sprint



Jump

# Game recommendation

Players should close all other applications when running Penguin Crisis as it can be taxing on laptops. When running the game the player should endure that FullHD is enabled if their computers can handle FullHD for the best gaming experience. Player can also control the master volume through the in game menu as well as the mouse sensitivity to their own liking.



# **Quests**

## Starting Mission - Player spawns

Player spawns in the igloo habitat.

Player looks around the environment and sees a group of penguins crowding together creating a commotion.

## Elder Penguin Mission

Player approaches the elder penguin.

The elder penguin tells the player about the situation in their habitat environment.

After knowing about the situation, the elder penguin sends the player on a mission to sabotage the industrial facility.

## Obstacle Mission

Player sees a bunch of broken icebergs and barrels blocking the way to the facility.

The player is supposed to jump over the obstacles without falling into the polluted water.

Falling into the polluted water will result in the player's death.

## infiltrating the facility

When the player arrives outside the facility, the player must make the way into the facility without being caught by the human guards.

The player will find an opening into the facility by climbing over a few boxes.

# **Quests**

## **Destroying the computers**

When the player makes it's way into the facility, the player will have to destroy the computers in the computer laboratory. The player will have to use the wrench to destroy the computers

## **Destroying the pipes**

After the player destroyed the computers, the player must now head towards the pipes.

Once the player reaches the destination, the player must use the wrench that found on the floor and destroy the pipes to stop waste flowing into the water.

The wrench can be used to attack the human guards.

## **Destroying the generators**

After the player destroyed the pipes, the player must now head the warehouse.

Once the player reached the warehouse, the player must destroy the generators without being caught by the guards.

The player must use the wrench to destroy the generators.

## **Escaping the facility**

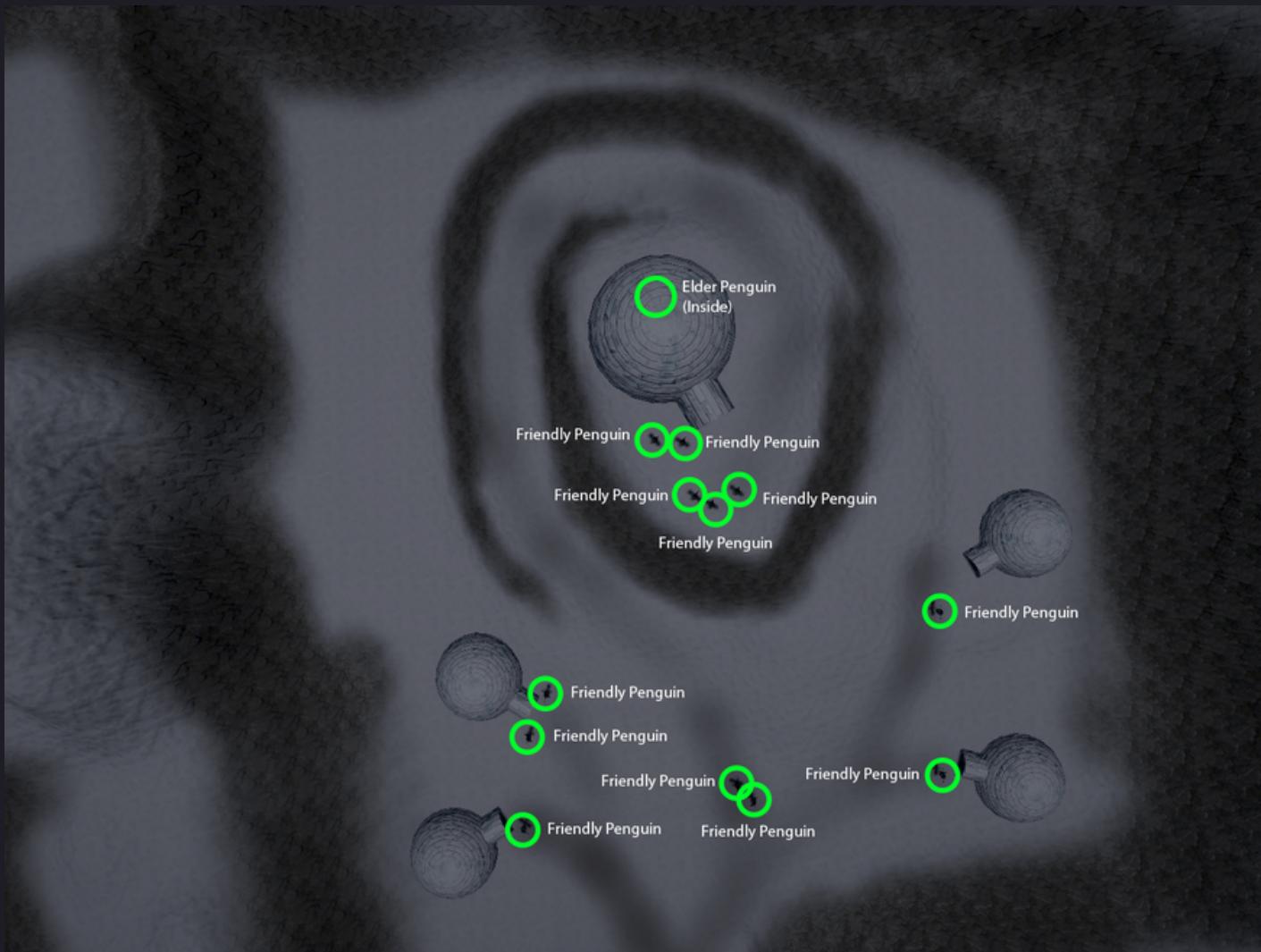
After the player has finished sabotaging the facility, the player must escape the facility without being caught by the guards. The player must find an escape route and make it's way back home.

# Game Statistics

This table includes the individual characters , weapons and machinery's health bar and features.

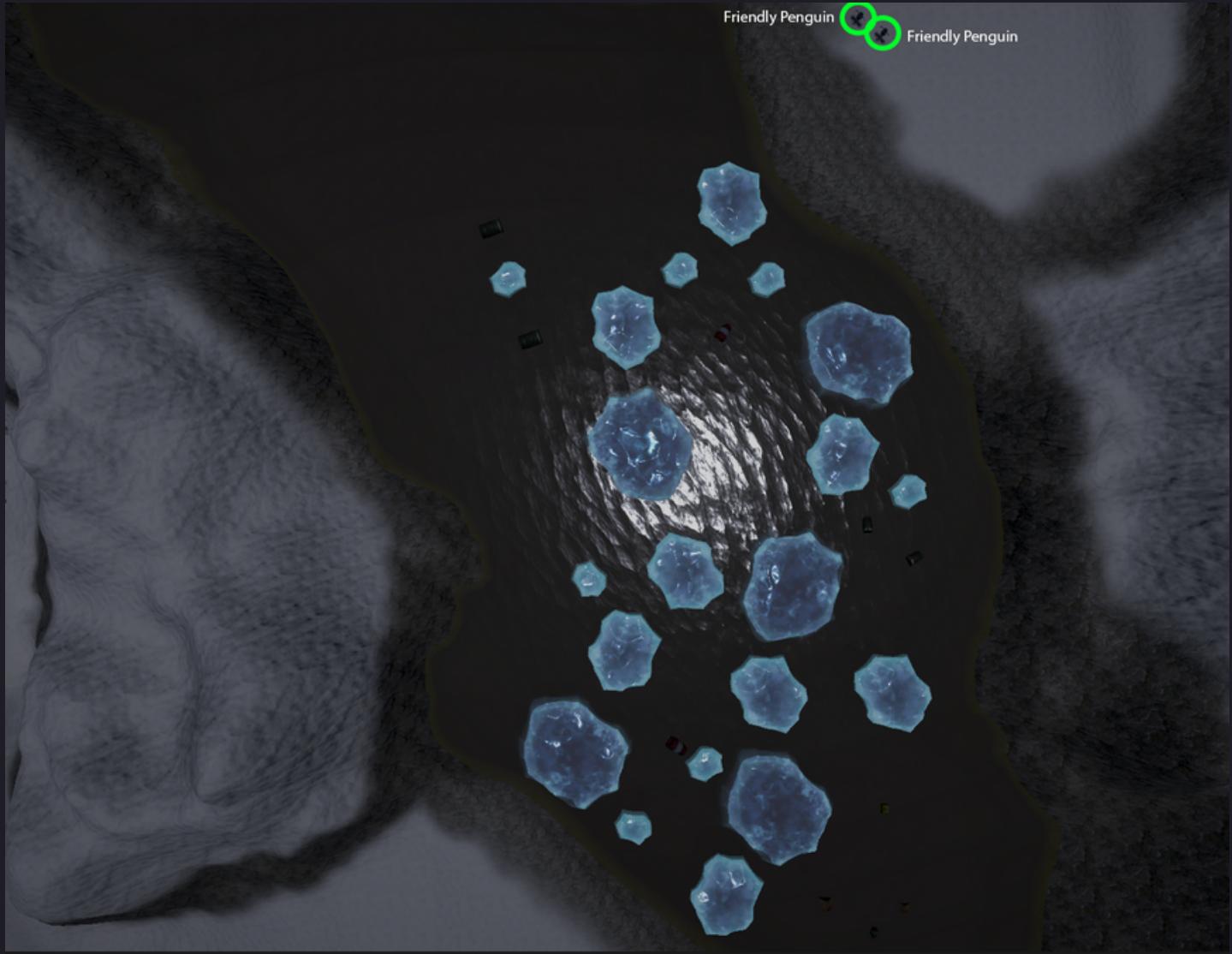
	<ul style="list-style-type: none"><li>• AI has a health of 100hp</li><li>• AI can take 4 seconds to regain hp after being stunned</li></ul>
	<ul style="list-style-type: none"><li>• Player has a health of 100hp</li></ul>
	<ul style="list-style-type: none"><li>• Generator has a health of 200hp</li></ul>
	<ul style="list-style-type: none"><li>• Computer has a health of 50hp</li></ul>
	<ul style="list-style-type: none"><li>• Pipe has a health of 50hp</li><li>• Can be used to damage the generator, computers and pipes</li></ul>
	<ul style="list-style-type: none"><li>• Fish heals the player by 20hp</li></ul>

# Levels



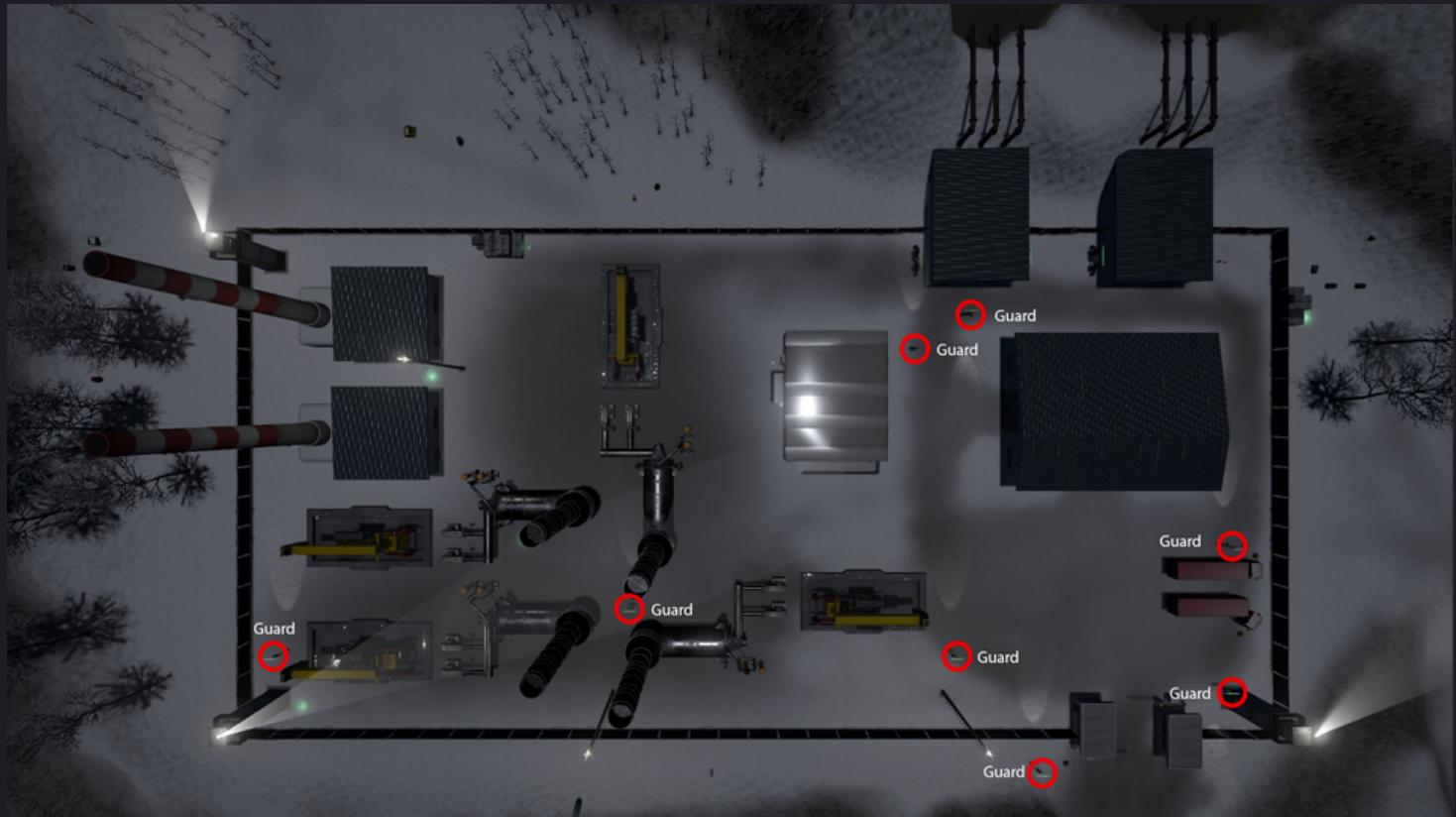
Level 1 consist of the penguin habitat. The level will include the elder penguin, penguins and their Igloos. Snow covers the area. The player will be spawned back to the beginning.

# Levels



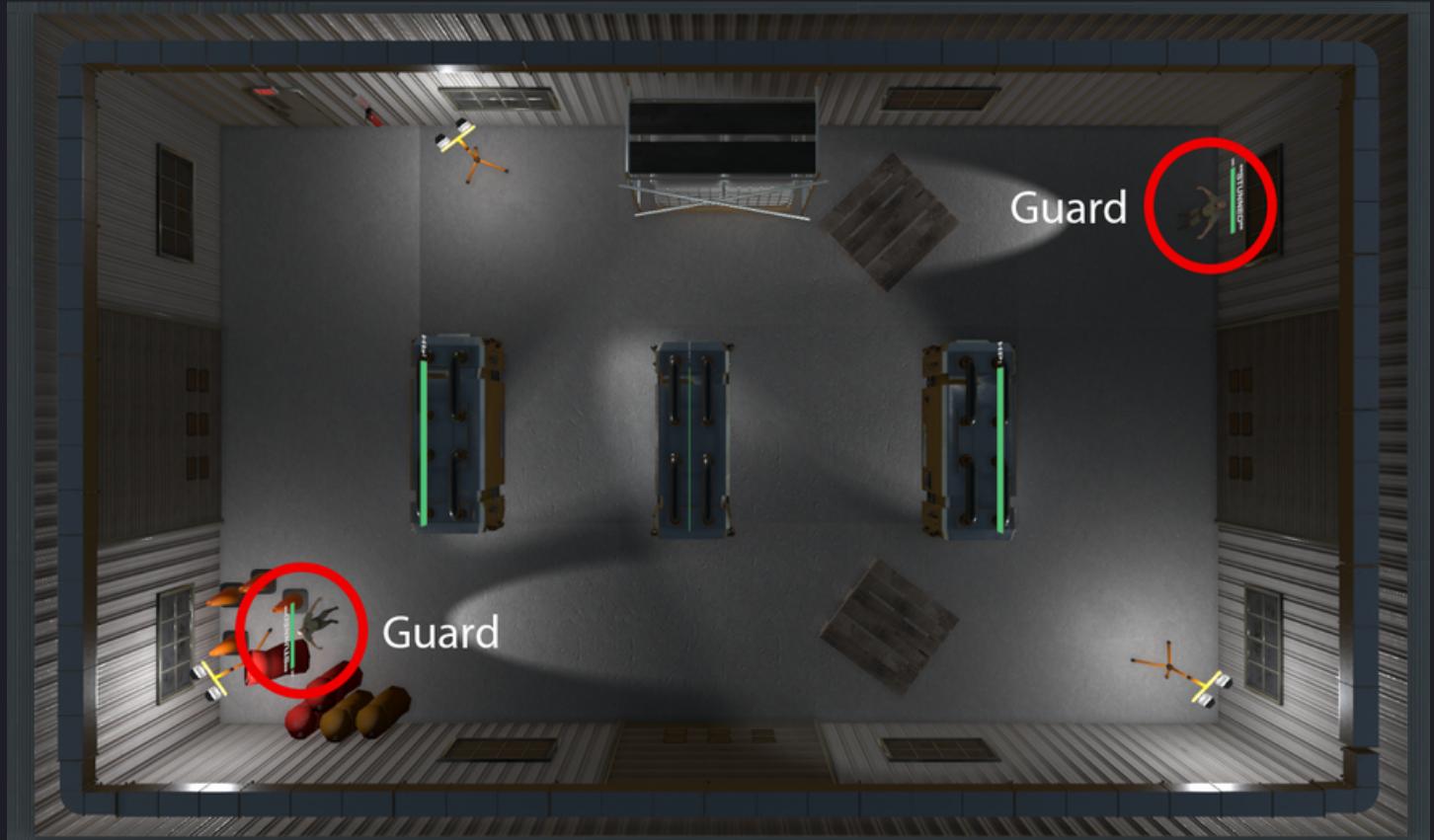
Level 2 consist of the obstacle course. The obstacle course will be needed to complete in order for the player to make its way across the lake. However, the player needs to time it right as the icebergs will sink randomly. The player will spawn back to the beginning.

# Levels



Level 3 consist of the Human facility which you as the player have to infiltrate the human facility without getting detected by the guards in order to complete the mission as briefed by the elder penguin successfully. The player will spawn back to the beginning.

# Levels



Level 4 consist of the generator room where the player has to destroy all the generators in the room without getting detected by the guard patrolling inside the generator room. If the player is caught, the player will respawn back to the beginning.

# Levels



Level 5 consist of the laboratory where the player must destroy all the computers containing all the human's research and important documents in order to put a halt to their operations. The player will spawn back to the beginning.

# Assets List

Name	Description	Links
<b>Footsteps - Essentials</b>	Footstep Noise	<a href="https://assetstore.unity.com/packages/audio/sound-fx/foley/footsteps-essentials-189879">https://assetstore.unity.com/packages/audio/sound-fx/foley/footsteps-essentials-189879</a>
<b>Single Detailed Truck</b>	Semi-Truck + Cargo	<a href="https://assetstore.unity.com/packages/3d/vehicles/land/single-detailed-truck-895">https://assetstore.unity.com/packages/3d/vehicles/land/single-detailed-truck-895</a>
<b>FREE Pipe Wrench</b>	Weapon for the Penguin	<a href="https://assetstore.unity.com/packages/3d/props/tools/free-pipe-wrench-187070">https://assetstore.unity.com/packages/3d/props/tools/free-pipe-wrench-187070</a>
<b>Modern Barrelz</b>	Industrial Barrels	<a href="https://assetstore.unity.com/packages/3d/props/industrial/modern-barrelz-48770">https://assetstore.unity.com/packages/3d/props/industrial/modern-barrelz-48770</a>
<b>AllSky Free - 10 Sky / Skybox Set</b>	Skybox	<a href="https://assetstore.unity.com/packages/2d/textures-materials/sky/allsky-free-10-sky-skybox-set-146014">https://assetstore.unity.com/packages/2d/textures-materials/sky/allsky-free-10-sky-skybox-set-146014</a>
<b>Chainlink Fences</b>	Fences Perimeter	<a href="https://assetstore.unity.com/packages/3d/chainlink-fences-73107">https://assetstore.unity.com/packages/3d/chainlink-fences-73107</a>
<b>Complete J. Suko Animals Pack</b>	Animal Pack - Use it for the AI	<a href="https://assetstore.unity.com/packages/3d/characters/animals/complete-j-suko-animals-pack-64924">https://assetstore.unity.com/packages/3d/characters/animals/complete-j-suko-animals-pack-64924</a>
<b>Basic Bandit</b>	Model of our Enemy	<a href="https://assetstore.unity.com/packages/3d/characters/humanoids/humans/basic-bandit-89978">https://assetstore.unity.com/packages/3d/characters/humanoids/humans/basic-bandit-89978</a>

# Assets list

Name	Description	Links
Industrial Props Kit	Used for decoration the generator environment	<a href="https://assetstore.unity.com/packages/3d/props/industrial/industrial-props-kit-84745">https://assetstore.unity.com/packages/3d/props/industrial/industrial-props-kit-84745</a>
Crate and Barrels	Props for the enviroment	<a href="https://assetstore.unity.com/packages/3d/props/industrial/crate-and-barrels-73101">https://assetstore.unity.com/packages/3d/props/industrial/crate-and-barrels-73101</a>
Winter Environment - Nature Pack	Terrain improvement and decoration	<a href="https://assetstore.unity.com/packages/3d/environments/winter-environment-nature-pack-142750">https://assetstore.unity.com/packages/3d/environments/winter-environment-nature-pack-142750</a>
Doors Windows Kit Set Up	Doors pack	<a href="https://sketchfab.com/3d-models/doors-windows-kit-set-up-6e63bba3057f47deb220967d01182a33">https://sketchfab.com/3d-models/doors-windows-kit-set-up-6e63bba3057f47deb220967d01182a33</a>
Simple Water Shader URP	Water Shader for our river	<a href="https://assetstore.unity.com/packages/2d/textures-materials/water/simple-water-shader-urp-191449">https://assetstore.unity.com/packages/2d/textures-materials/water/simple-water-shader-urp-191449</a>
QA Office and Security Room	Environment Decoration- Especially for the Research Lab	<a href="https://assetstore.unity.com/packages/3d/environments/urban/qa-office-and-security-room-114109">https://assetstore.unity.com/packages/3d/environments/urban/qa-office-and-security-room-114109</a>
19 Buildings & Structures Collection - Vol 1	Building Props	<a href="https://sketchfab.com/3d-models/19-buildings-structures-collection-vol-1-9bc6afc388ba47738b5864abf148bfcb">https://sketchfab.com/3d-models/19-buildings-structures-collection-vol-1-9bc6afc388ba47738b5864abf148bfcb</a>
Industrial Buildings Pack	Industrial building for our environment	<a href="https://sketchfab.com/3d-models/industrial-buildings-pack-707e11c7c0e549a5957dc968fda472ca">https://sketchfab.com/3d-models/industrial-buildings-pack-707e11c7c0e549a5957dc968fda472ca</a>

# Assets list

Name	Description	Links
Chemical Tank	Props	<a href="https://sketchfab.com/3d-models/chemical-tank-63c001e74ff5402fbcf1338479c9c0c5">https://sketchfab.com/3d-models/chemical-tank-63c001e74ff5402fbcf1338479c9c0c5</a>
Oil Derrick 01	Oil derrick for more industrial looks	<a href="https://sketchfab.com/3d-models/oil-derrick-01-01197414989d4b2fb695139353f80e7e">https://sketchfab.com/3d-models/oil-derrick-01-01197414989d4b2fb695139353f80e7e</a>
MilitaryBase_PortoVelho_Mast Lighting	Tall spotlight	<a href="https://sketchfab.com/3d-models/militarybase-portovelho-mastlighting-6a854374dd92407d8f8dc861c7140ce">https://sketchfab.com/3d-models/militarybase-portovelho-mastlighting-6a854374dd92407d8f8dc861c7140ce</a>
FROST - Starter Kit	Iceberg for our river	<a href="https://sketchfab.com/3d-models/frost-starter-kit-fc14901a4179496599ee8aef8ebb33f1">https://sketchfab.com/3d-models/frost-starter-kit-fc14901a4179496599ee8aef8ebb33f1</a>
Industrial Thermo Oxidizer	Industrial Props	<a href="https://sketchfab.com/3d-models/industrial-thermo-oxidizer-2cbcc4508d3a4402bc76e9020b70ccac">https://sketchfab.com/3d-models/industrial-thermo-oxidizer-2cbcc4508d3a4402bc76e9020b70ccac</a>
Machinery device	Props	<a href="https://sketchfab.com/3d-models/machinery-device-60a7720cd0034f88a5cbf4733e61cac">https://sketchfab.com/3d-models/machinery-device-60a7720cd0034f88a5cbf4733e61cac</a>
Low Poly Game Backflow Water Pipe Constructor	Props	<a href="https://sketchfab.com/3d-models/low-poly-game-backflow-water-pipe-constructor-9fff64c0cbe2407dbc1000976f45eed">https://sketchfab.com/3d-models/low-poly-game-backflow-water-pipe-constructor-9fff64c0cbe2407dbc1000976f45eed</a>

# **Limitations**

There are some limitations in the game that my group has not managed to complete or achieve.

## **Player limitations**

- The player is unable to crouch.
- The player cannot heal themselves, only able to heal by consuming fishes

# **References**

## Game Menu Ui Tutorial

[https://youtu.be/zc8ac\\_qUXQY](https://youtu.be/zc8ac_qUXQY)

## Game Menu Sound Tutorial

<https://www.youtube.com/watch?v=IDBlu3Elkew>

## Game Health System Tutorial

[https://www.youtube.com/watch?v=BLfNP4Sc\\_iA](https://www.youtube.com/watch?v=BLfNP4Sc_iA)

## Game Dialogue System Tutorial

[https://www.youtube.com/watch?v=\\_nRzoTzeyxU](https://www.youtube.com/watch?v=_nRzoTzeyxU)

## Game NavMesh Tutorial

<https://www.youtube.com/watch?v=atCOd4o7tG4>

## Game Enemy AI Tutorial

<https://www.youtube.com/watch?v=UjkSFoLxesw>

## Game Sound Effect Tutorial

<https://www.youtube.com/watch?v=QL29aTa7J5Q>