

A3D Report 'Deep Sea Exploration Lab'

Narrative Context

This experience is a climactic part of a mystery-thriller game, based around a suspicious and elusive ocean exploration company called Depth. In the game, the player would find themselves in this chosen environment after finding the secret location of, and travelling to, Depth's key underwater laboratory which is host to a multitude of unexplained events. The scene includes multiple hints towards Depth's questionable nature, such as the passive-aggressive documentation beside the red alarm as well as a key slot in the module situated in the viewpoint area. Notably, this module is behind a pair of suspiciously large doors: who are they meant to keep out? And why? These are the types of questions the player would be asking when experiencing this environment. These clues, along with highly rendered, realistic mood lighting would enforce the eerie atmosphere onto the player, with additional immersion being created by a warble of oceanic noise and a faraway cry of a looming entity. This entity, visible to the player if they look out one of the many glass walls, is a shadowy figure with subtle movement. Its restrained movement creates the feeling of a deep, looming threat, adding pressure to the already imminent noise of the alarm blaring in the background. As the player navigates through this accumulation of intrigue, they are met with interesting graphics and a design style where the future meets industrial in this mixture of retro infographics and modern environment. As they explore, they may draw their own conclusions or even make their own narrative, as the scene continues to disorientate and intimidate.

The Experience

Upon loading the scene, the player is stood in the elevator hallway, able to hear the emergency intercom and the atmospherically eerie environment around them. If they step forward, they are introduced to the main space, the large windows encouraging them to look around themselves and noticeably spot the large sea creature looming in the distance. The player is immediately overwhelmed by the amount of information presented in the main lab space, with the red alarm sounding from the desk on the left of the room, its deep red glow lighting up various parts of the room. The player has several elements to explore in the main space: they can observe the centre feature which is an empty oval frame, having two warning messages hovering over the control lever displaying "Warning: Hostile Lifeform Detected" and "Terrain Generation Offline". The small lever on the edge of the oval frame indicates that the empty frame is supposed to generate a terrain map when pulled, however since the lab is in an emergency state, no controls are available.

Moving clockwise, the player would next come to the desk on the left side of the room, hopefully noticing the large canvas on the entrance wall with the company logo 'Depth' and the text "Deep Sea Exploration Since 2056". As the player observes the desk, they notice the intricate control pad, as well as various small meters and a sonar displaying animated textures. The desk conveys how this lab is a futuristic and retro-inspired universe, where the company 'Depth' is researching and measuring something intricate on the sea floor. As they move across the desk, observing terrain height maps, CCTV images, and binary sequences,

they come to the red alarm at the end. Next to the alarm, they might spot a document containing contextual information regarding Depth, and inferring their potential suspicious activity as the document states employees will be immediately terminated if the alarm is triggered. This would entice additional questions such as: who triggered the alarm? Why was it triggered if the consequence would be employee termination?

Moving to the back of the space, the player will observe an empty glass tub, providing intrigue to its use as they make their way to a pair of industrial blast doors. Upon approach, the doors automatically open with a clanking noise, revealing to the player a small glass viewpoint with a singular module in the middle. Before entering, they might observe the additional poster hanging on the wall above the doors with the Depth logo and slogan "Curiosity Never Dies". As they approach the module, the sound of the alarm recedes as the doors close behind them and they get an uninterrupted view of the sea creature suspended, moving ominously above the lab to the east. The sound design the player experiences in this encapsulated space adds to the growing dread the environment emanates and the player has a choice to stay or keep exploring the features of the main space.

Ideation & Aesthetics

When first ideating the concept of the environment, I thought about personal preferences: what stimuli cause the biggest reaction in my opinion? This, paired with what game design styles I often admire, enabled me to create loose themes such as underwater, futurism and mystery. To further develop these core themes, I looked at existing examples of environments to give me an idea of what mechanics, both in terms of look and function, serve as effective narrative devices. Below you will find representations of these examples:

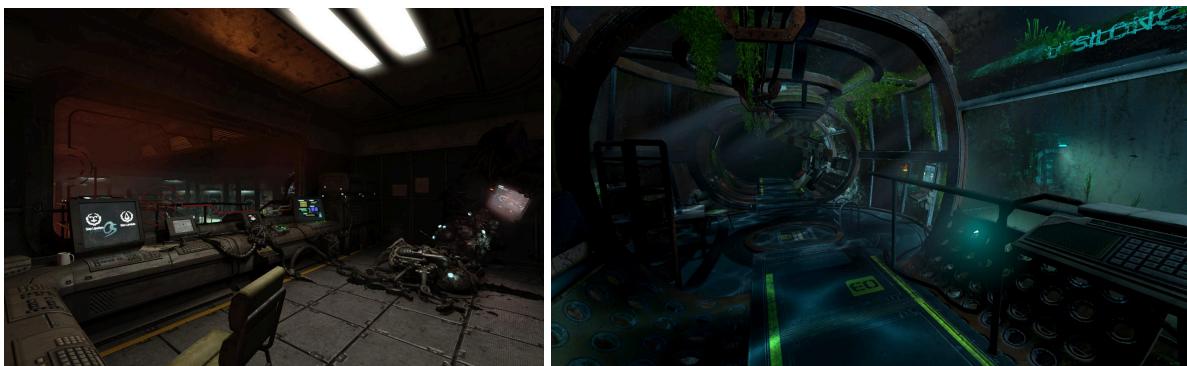
Fig. 1 & 2 - Oil Tank Culture Park located in Seoul, South Korea, inspiration found through a K-Drama where it was the base of a high-spec drug lab.



Fig. 3 - Plesiosaur Skeleton at the Houston Museum for Natural Science. Inspired the idea of a large sea entity.

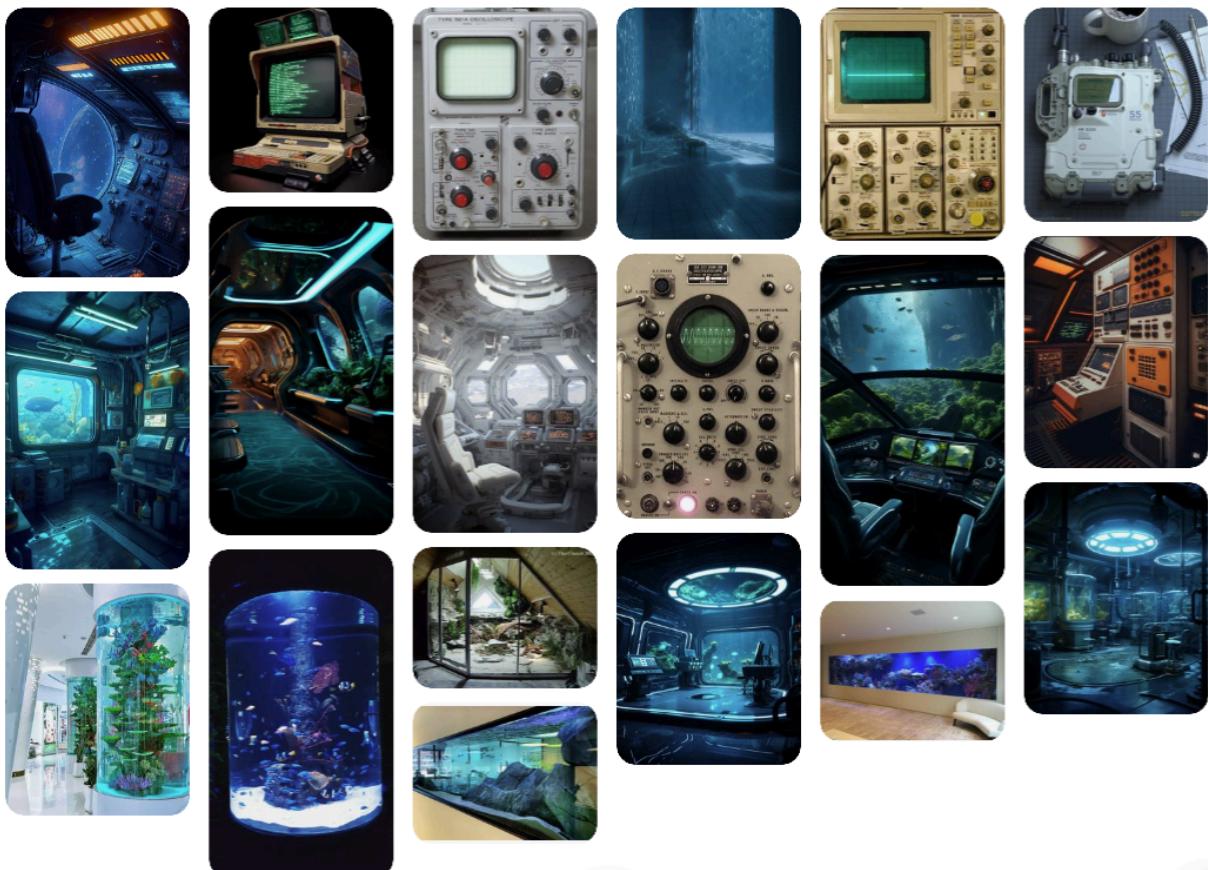


Fig. 4 & 5 - Screenshots from the game Soma (Frictional Game, 2015). Inspired the horror-underwater environment and retro-looking desks.



The oil tank located in a Seoul Culture Park, sparked the idea to have a big glass building that not only has an interesting interior but can add context through the exterior view. This, paired with the visuals of the game Soma (an FPS underwater horror game) gave me the base idea to start working from. After developing this underwater lab concept, I started to think about what the purpose of the lab was, who owned it and what you can see from it. These questions led to the creation of the retro-futurism aesthetic and background narrative that developed. Below is an image representation of the mood board I used to work from when creating textures and 3D models:

Fig. 6 - Mood Board



I chose to use and imitate this style because it fits very well with the contextual narrative that was forming: the use of dated infographics and meters with the neon green visual complemented the narrative of an underwater lab and subsequently created a synchronous effect with the low lighting and dark surroundings. Furthermore, the use of retro elements along with a dark environment creates a cautious atmosphere which adds to the purpose of the scene. The elements together with technical implementation and rendering create an aesthetically pleasing environment to explore despite it evoking a sense of fear.

Technical Implementation

Modelling

All 3D models in the scene were made using Blender. A total of 47 models were made from scratch and categorised into an effective workflow that allowed me to navigate all the meshes in Blender appropriately. As I was modelling, I was conscious of keeping topography efficient: faces that didn't need subdivision had dissolved edges and vertices to keep the polygon count as low as possible, while still achieving the standard of aesthetic that I wanted. The lab building was modelled all in the same blender project so that I could interchange and experiment with different ideas as the models developed. Material placeholders were assigned to every model with a standard RGB colour so that they could be easily assigned in Unity with the correct texturing and UV maps. While most animation was controlled with scripts and state machines in Unity, the

'SeaMonster' model was rigged and animated within Blender so that the movement would be exported all as one file and easily looped. While the modelling stage of development took the longest to complete, the outcome ensured for smooth workflow when assigning textures and lighting the scene in Unity.

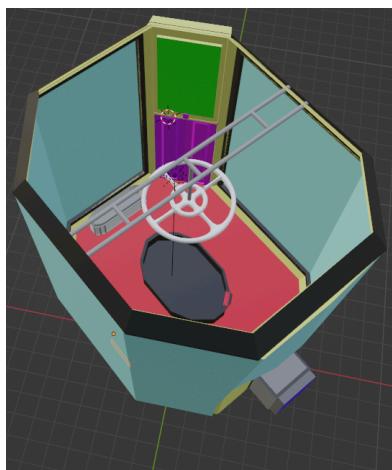


Fig. 8 - Material Assignments

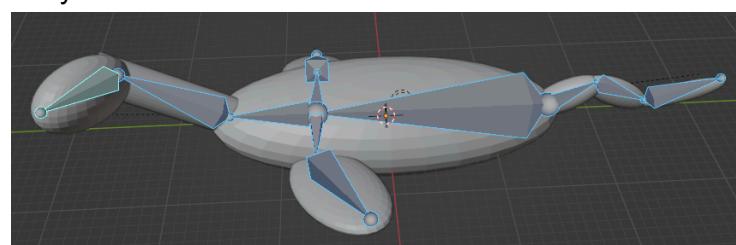
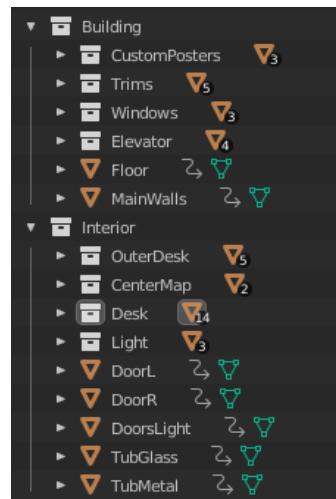


Fig. 9 - Armature For 'SeaMonster'

Fig. 7 - Blender Hierarchy



Textures & Graphics

Within Unity, textures were effectively assigned by exporting Blender models as .fbx with baked UV maps. Most textures were made in Photoshop from scratch apart from the floor, concrete, ceramic and metal textures, and then added to materials created in Unity. Doing this made it constructive when developing a clear narrative and aesthetic for the environment, inducing a sense of context into the space without needing exposition and having creative reign, using the inspiration examples above to achieve the desired scene design. Some textures were animated using image arrays to enhance the realism of the

environment such as the sonar screen and desk visuals. This was done by creating iterative designs for the same object and then using a script to display them as frames elapsed. An example of this can be seen below.

Fig. 10 - Image array for the sonar object.



Fig. 11 & 12 - Examples of textures made in Photoshop from scratch.

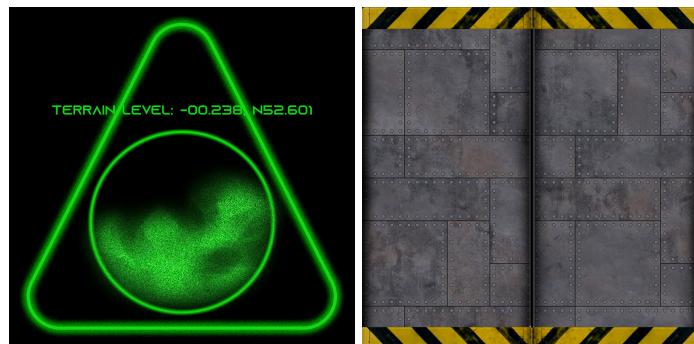


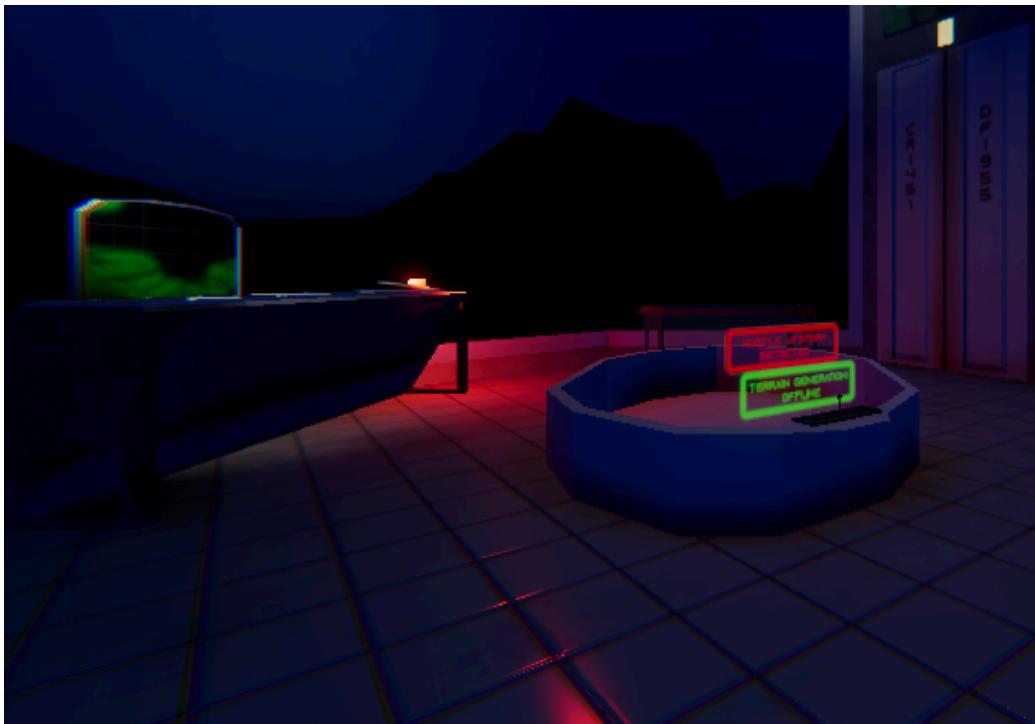
Fig. 13 - Depth Billboard Graphic made in Photoshop from scratch.



Lighting & Rendering

The scene was rendered and lit in Unity using the HDRP Pipeline to enhance the visual dynamic of lighting and reflections. Since my scene is contextually in a dark environment, I wanted the reflections of lights, such as the red alarm, to be a high-quality effect to make the environment seem more realistic and aesthetically pleasing. To light the scene effectively, a custom skybox was created by creating a cube map in Photoshop and then assigning it to an HDRI Sky. This meant that I could set the exposure and colour of the scene to a low hue of blue to fit the environment of the deep ocean. Point and area lights were used to subtly light specific elements that I wanted the player to view so that the narrative of the environment came across naturally. Lighting was rendered using Realtime to give a dynamic effect as it updates every frame.

Fig. 14 - Screenshot of Lighting in the Environment



Scripting

Four scripts were used in the scene. The first: 'AlarmFlashing.cs' uses two variables to alternate between RGB colours based on the time elapsed and the speed set with a Mathf.PingPong. These variables are publicly assigned in Unity, with the base colour being set to black so that it appears the alarm is flashing red on and off.

The second: 'AnimScript' uses an 'if' statement to compare if an object with the 'Player' tag triggers the collision area. If it does then the animation for the doors to open and close is played, based on the state machine. This script was assigned to two cubes with a collision mesh on either side of the doors so that they would open upon approach and give enough time for the player to walk through before closing in sequence.

The third: 'ChangingTexture.cs' uses a time interval to iterate between an array of textures that are assigned publicly in Unity, resulting in the moving texture effect. This script was used on various objects such as the sonar and desk elements to increase immersion and realism.

The Fourth: 'SpriteLoop.cs' uses the same technique as 'ChangingTexture' but instead switches between two Sprites in a set interval. This script was used for the messages hovering over the oval centre, attached to an empty game object so they look as if they are suspended holograms. All four scripts were written from knowledge, using the Unity Documentation for reference to specific syntax and also community forums such as StackOverflow for problem-solving.

Sound & Post Production

Six sounds were used in the scene to develop a sense of atmosphere and realism. All of these sounds, except 'Intercom', were sourced from the website freesound.org and are

referenced at the end of the report. The Intercom audio was created by using an online text-to-speech generator called murf.ai and then exported into the software Audacity to add reverb effects. Besides the aforementioned lighting choices, post-production effects such as bloom and chromatic aberration were added to the HDRP volume to give the camera distortion and a sense of unease to match the surrounding environment. All sounds were thoughtfully chosen to increase immersion, as they contain an uneasy tone.

Reflection

This experience is successful in delivering a suspenseful and immersive environment, which uses custom graphics and textures to deliver a thought-provoking narrative. The concept of a deep-sea lab is compelling but is magnified by narrative decisions, such as making the walls of the lab mostly glass, which adds to the feeling of being in a desolate and isolating environment. The use of the flashing alarm as well as error messages and harrowing sound effects makes this experience truly chilling and would transport the player into the space instantly. To improve this environment, more time could be spent developing the textures to ensure that colour and depth add to the realism of the environment, for example: developing the vertical screen on the desk to display different CCTV renders with moving elements. Additionally, adding the use of the lever on the oval centre to generate a 3D terrain would increase the interactivity of the environment. Due to time restrictions, this idea had to be effectively replaced with the floating error messages which still add to the narrative immersion despite not being the original idea. In the future, more interactivity could be added to make this environment even more immersive and realistic, adding to player enjoyment while the existing narrative keeps them interested in progressing through the game that this experience would be a part of.

Word Count: 2264

Reference List

Description	Image	Source	Licence/Permission
First-Person Controller Prefab		Simon Pasi Unity Asset Store https://assetstore.unity.com/packages/tools/input-management/mini-first-person-controller-174710	Standard Unity Asset Store EULA
Concrete PBR Material used for walls		FreePBR https://freepbr.com/materials/concrete-3-pbr-material/	Personal Use
Base White Tile PBR Material used for floor		FreePBR https://freepbr.com/materials/base-white-tile/	Personal Use
Ceramic White Material used for walls and trims		Poliigon https://www.poliigon.com/texture/ceramic-plain-white-001/5212	Personal Use
Metal Material used for desks and elevators		TextureCan https://www.texturecan.com/details/611/	Personal Use

Black and Yellow Door Image used to make elevator texture		iStock https://www.istockphoto.com/search/2/image-film?phrase=black+and+yellow+hazard+stripes+on+a+metal+door	Standard Use
Industrial Alarm Sound		Latranz Freesound https://freesound.org/people/Latranz/sounds/520200/	Standard Use
Backrooms Ambience Sound		Resaural Freesound https://freesound.org/people/Resaural/sounds/626096/	Standard Use
Dive Deep Sound		hisoul Freesound https://freesound.org/people/hisoul/sounds/365659/	Standard Use
Whale Sound		McDrok_the_RhythmnDoc Freesound https://freesound.org/people/McDrok_the_RhythmDoc/sounds/673463/	Standard Use
Industrial Garage Door Sound		captainvince Freesound https://freesound.org/people/captainvince/sounds/223549/	Standard Use
Text-to-speech AI Website		Murf.ai https://murf.ai/	Personal Use