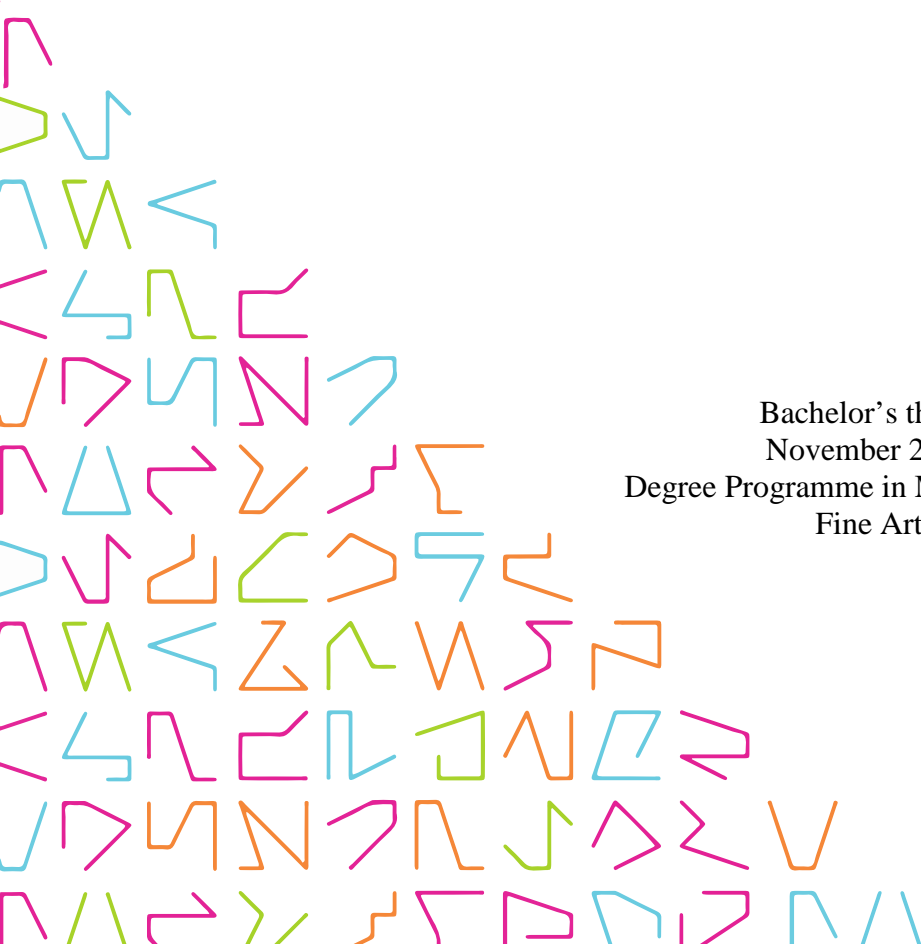


Deep in the Cold (3D)

Interactive video installation adaptation of
a photobook

Juuso Kuivila

Bachelor's thesis
November 2018
Degree Programme in Media and Arts
Fine Art



ABSTRACT

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Deep in the Cold (3D)
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This thesis explores the issues and solutions in the development of an interactive video work based on a photobook. Different software and hardware solutions were considered with the focus on their functional and semantic properties within an art exhibition, while maintaining an affordable development resource scheme.

As such, modern entertainment devices in the realm of AR and VR were studied for display purposes, with more traditional two-dimensional projection as an alternative.

The user interface of an artwork becomes a factor with the inclusion of interactivity, as does the role of the audience: both active and passive (observer) roles are to be considered, especially with regard to technical requirements and resources.

Video game logic and theory is explored within the requirements of a fine art gallery.

The physical aspects of the installation, including the control scheme, were studied.

The nature of the virtual adaptation, in contrast to the original artwork, was considered.

The visual and emotional aspects of the photobook were adapted to an entirely new form, with the inclusion of characters and objects that tell their own story.

Keywords: AR, VR, artwork, adaptation, case, performance, blender, interactive, development

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1 Introduction: Deep in the Cold

In 2016, a photobook, *Deep in the Cold*¹, explored what journalist Ted Gup once described as *Architecture of Fear*; shelters built in anticipation of warfare or extreme natural disasters. (Gup, T. 1991.)

The book featured a zine-like format of a paperback book, with relatively low quality black and white print. It utilised the aesthetic of guerrilla journalism and counterculture printmaking (Triggs, T. 2006.) and exploration of societal trauma and the infrastructure of fear.

The interactive, explorable video work presents an artistic, audiovisual future scenario, where culture is reduced to scraps and humanity and nature have suffered the same faith.

This thesis explores the adaptation of the photobook into an interactive video installation with elements of participative performance, while maintaining the spirit of the original.

Below: the book within the installation. Photo: Alisa Komendova.



¹ Kuivila, J. 2016.

An interactive adaptation requires the study of not only the artwork in question, but many technical issues. The limitations and benefits of head-mounted displays were considered as well as those of more traditional video work presentation techniques. The nature of a virtual world and the logic upon which it runs was essential for the artwork to function properly. Conventional wisdom in art and game projects did not always apply to combinations of the two: a congruence of the two had somehow to be established. Feature creep as an issue is observed as it would in a game development project. Similarly, the management of development resources, mainly financial, was an important focus point. As a multimedia project, not only was the visual aspect to be carefully considered, but the aural components, possible music, and the graphic design of some elements had to all be thought out and developed.

Open-source and paid development software were explored for their compatibility and features. The writing of code is avoided through the use of logic nodes.

With the aforementioned issues explored this thesis presents a case study of the development of an interactive artwork with a three-dimensional future world, based on the dark and apocalyptic original photobook work.

Below: an early attempt at creating a digital world in the Unity development software.



1.1 History of performance and interactive installations

Performance and technological, interactive installations have been explored for well over a century (Dixon 2009). Futurist plays staged in Europe in the early 1900s by Prampolini (Prampolini, 1915) and others took the newest technology of the time and staged outrageous plays enhanced with lights and mechanical apparatus (Dixon 2009, 47-58.). As the transistor era rolled in, futurist dreams of light shows combined with multi-directional sound were brought to reality: bands like Jefferson's Airplane and Pink Floyd (Pover, G. Russel, I. 1998) displayed as much ingenuity in their show installations as they did in their music. Further along the line in the late 80s and through the 90s, Jean-Michel Jarre took futurist dreams to a performative ultimate at the time with his concerts in Paris, Moscow, and other cities. His performances with cutting edge technology and millions of audience members continue to defy description. (Forman, E. 2010 139, 179.)

1.2 State of VR

Virtual Reality as dreamt by William Gibson in his fiction is slowly seeping from the pages of fiction to pages of history (Gibson, W. 1984). While current technology remains limited, a final futurist performance looms somewhere in the distance. (Dixon 2007, 54-58, 363-394.).

Video games are a natural medium to be modified into this new realm. Their interactivity and three-dimensionality makes it easy to move assets and mechanics. Movies, where the audience need not participate in ways other than the movement of their gaze, have been made in 360 degrees since Walt Disney Imagineering's *Circarama*² (1955) and the first narrative story with the technology, directed by Jeff Blyth: *The Timekeeper / Le Visionarium* in 1992, starring Robin Williams (Internet Movie Database, 2018).

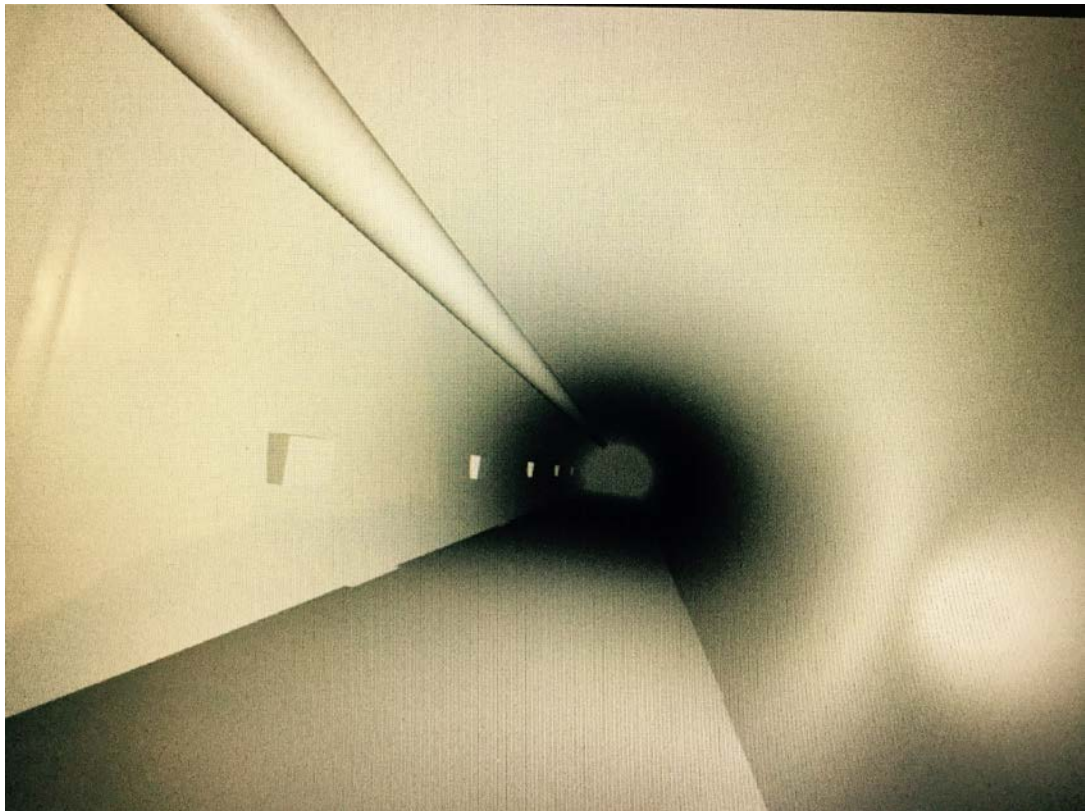
In the present day, despite developing tools becoming easier and cheaper to use by the year, 360 degree and interactive works in general still yield in prevalence to traditional video works in a gallery setting. The selling of art may also be a factor in the production of art, and works requiring at the least a continuously running desktop computer are not the simplest to collect and display, though such collections exist and are even in vogue in some areas. (Miller, New York Times, 2017)

² Later the *Circle-Vision 360*

2 The challenges

There are relatively few artworks on display that utilise a game-engine driven main interactivity component. On one side of the coin, it is a challenge because one has to start nearly from scratch when exploring the process of artwork adaptation or creation. On the other, it is a blessing to have a relatively unpopulated field to barge into. (Dixon 2009, 599-621.)

Below: an early learning experience in Blender using cylindrical shapes.



2.1 Hardware

On the hardware side of things, an installation adaptation with a video game engine could still physically be almost anything, depending on the workflow and software chosen. A row of Apple iPads, running Unity-based software with touch controls is entirely plausible. An arcade cabinet housing a modern PC with excellent graphics performance, with a 4K screen or a mounted headset, mimicking the stance used in the *Battlezone* arcade cabinet³ (Rotberg, E. 1980). Likewise, headsets and wireless controls would provide one or

³ The cabinet had two joysticks, each controlling a track of a tank. The driver /player had to lean forward so his face was against a moulded viewing port.

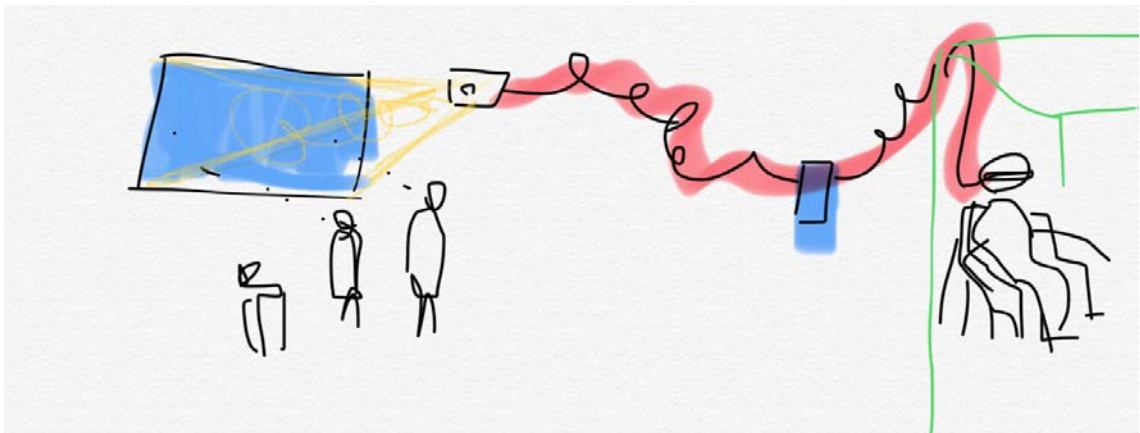
two people at a time with a 360 degree experience. The installation could even mimic a home arcade system of the 80s with a CRT television and an Atari style joystick.

The headsets readily available through the Tampere University of Applied Sciences were the Samsung phone-based system and the HTC Vive system with infrared tracking points and handheld remote controllers.

While the Vive system is impressive, especially in the precision of tracking, it only works on one person at a time (unlike a projection or regular screen). This limitation also applies to the Samsung Gear headset system. Additionally, the mounting of the infrared reference points might prove difficult in a gallery space. (HTC Corporation, 2018)

The stability of a system with battery-powered controllers and carefully calibrated locations is not one that easily translates to a gallery space, especially if the software is unstable for any reason over a long period of time. The troubleshooting becomes more complex.

Below: a very early sketch for a "pilot" audience member and "viewer" members.



2.2 Software

As development of the software started in late 2017, the options considered in software were Blender, Unity and Unreal. These each offered their own benefits and drawbacks. Blender, as an open-source 3D modeling and animation software, is the only option that is completely free of charge (The Blender Foundation, 2018). Meanwhile, Unity and Unreal provide better support and wider publishing options. (Unity Technologies, 2017) However, Unity required a subscription, and Unreal was the least familiar option to the artist.

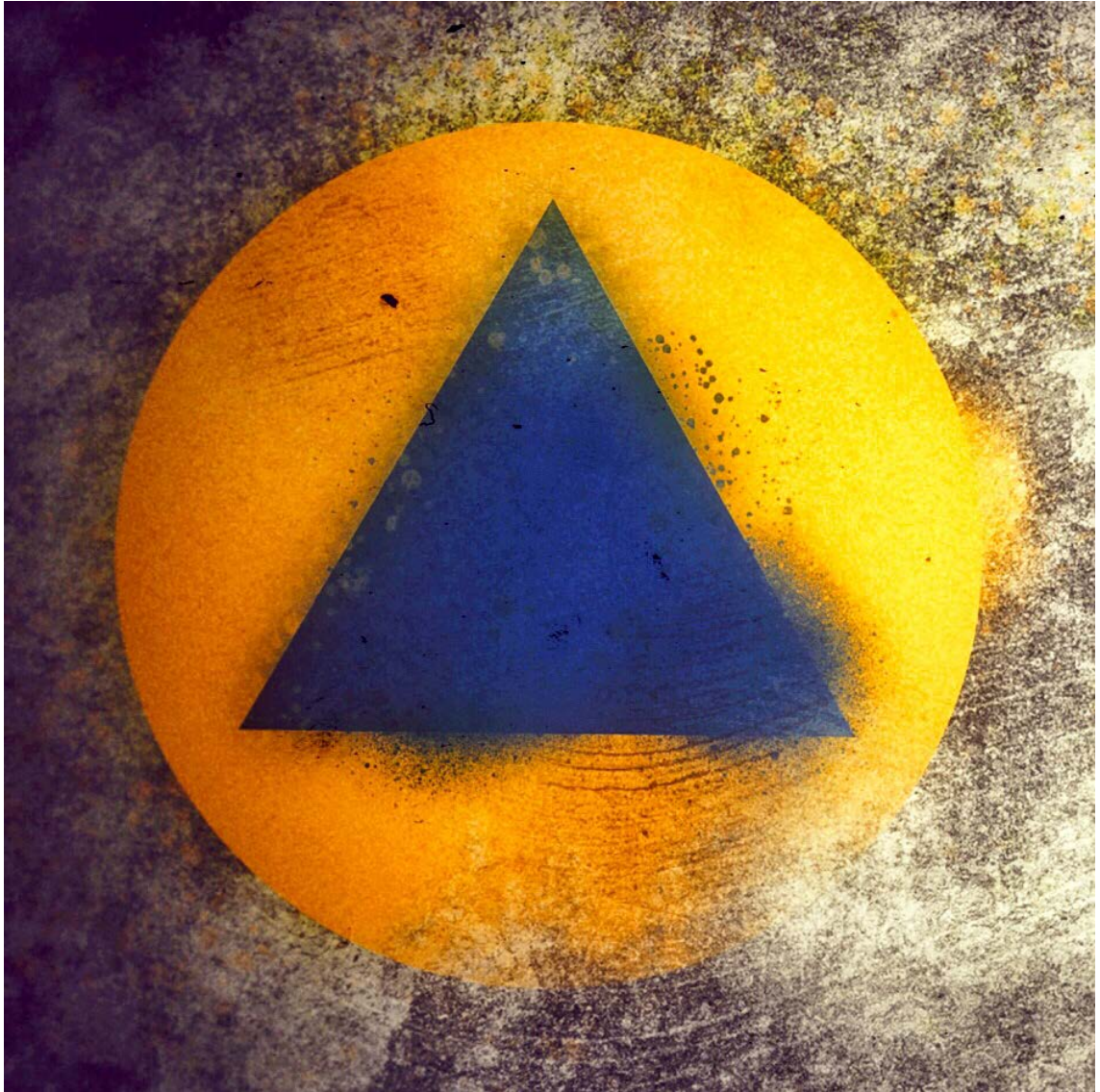
In the custom software, that is, the virtual world to be projected, the striking of a balance between an objective or challenge, and the possible lack of such constraints or rewards is imperative. For instance, a game-oriented approach could include the activation of a system to make threatening-looking characters disappear and doors open, while failure to do so would reset the game. This mechanic would not be unlike a game of Pac-man⁴. Conversely, the world could be simply ambience, a performance that does not effect the player, with no repercussions except the effect of the ambience.

Below: one of several considered "graffitis" or "artworks" for the future world.



⁴ By Toru Iwatani, 1980. Published by Namco, Bandai and Midway.

Below: Another mystical artwork for those that dwell in the future.



2.3 In real life and virtual: UI

Another matter to consider as was the UI. Should the game attempt to look like a complete video game with start screens, health bars and a gameplay HUD? Or should it be idiot-proof and durable, as in an arcade? How does the look and feel of the elements present in the installation speak to the audience in an art gallery? It must be apparent that the artwork is indeed interactive, and meant to be approached and manipulated, inviting the audience.

2.4 What lies within



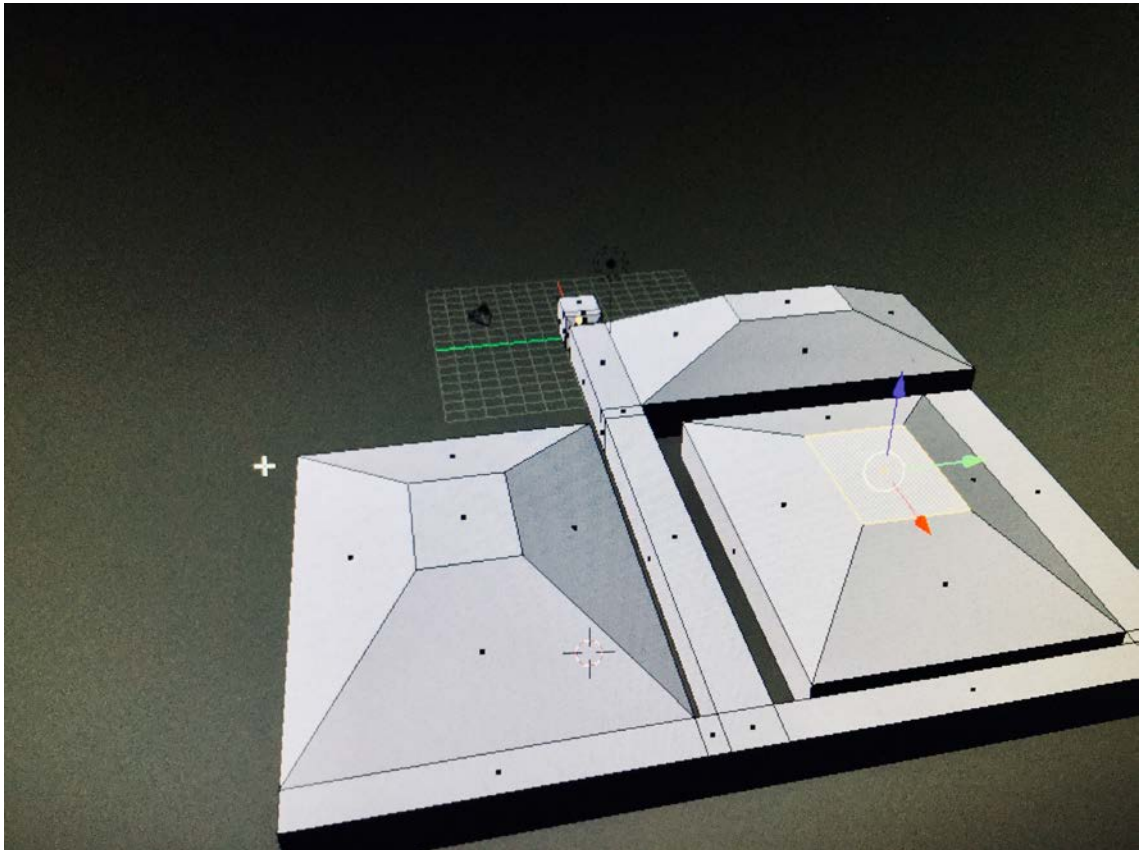
Above: a sketch of the installation as seen by an audience member

At first, the world was not intended to have occupants. But testing revealed that most people expected there to be *something* in the world, even if rarely or fleetingly. To test such an inclusion, humanoid shades were created. Three-dimensional and with human proportions, they were completely dark, emitting no light and reflecting no light. These eventually gained the nickname "Shadows". Upon presenting these characters to an impromptu audience, the creatures elicited powerful responses from the colleagues who saw them.

Some balance between artistic and gamified purpose had to be achieved for the Shadows as well.

The Shadow creatures could, for instance, haunt the player, but not "hurt" him. The avoidance and banishing of these Shadows, who represent the possible grim future of humankind and the darker impulses in us all, could function as a "game" mechanic as well as an artistic statement.

Below: progress in level design.



3 The Solutions

For hardware, a custom joystick was created out of recycled materials and a game controller. It provides the user with no more than four arrows to indicate directions, and a stick to manipulate, while looking like it belongs in the installation with traces of rust, solder and circuit boards visible. The purpose is to seamlessly extend the game world into the actual installation space, while also inviting and instructing the average visitor of the method of manipulation.

After considering the audience and the nature of VR headsets, it became apparent that several would be required for an audience to be able to simultaneously participate in viewing the artwork, as it is guided by the "performing" member of the audience. To simplify this, a more traditional projection screen was chosen. This also simplifies the gallery space requirements, as infrared spatial locators and other associated installations are not necessary.



Above: successes in design and visual effects

3.1 The Shadows

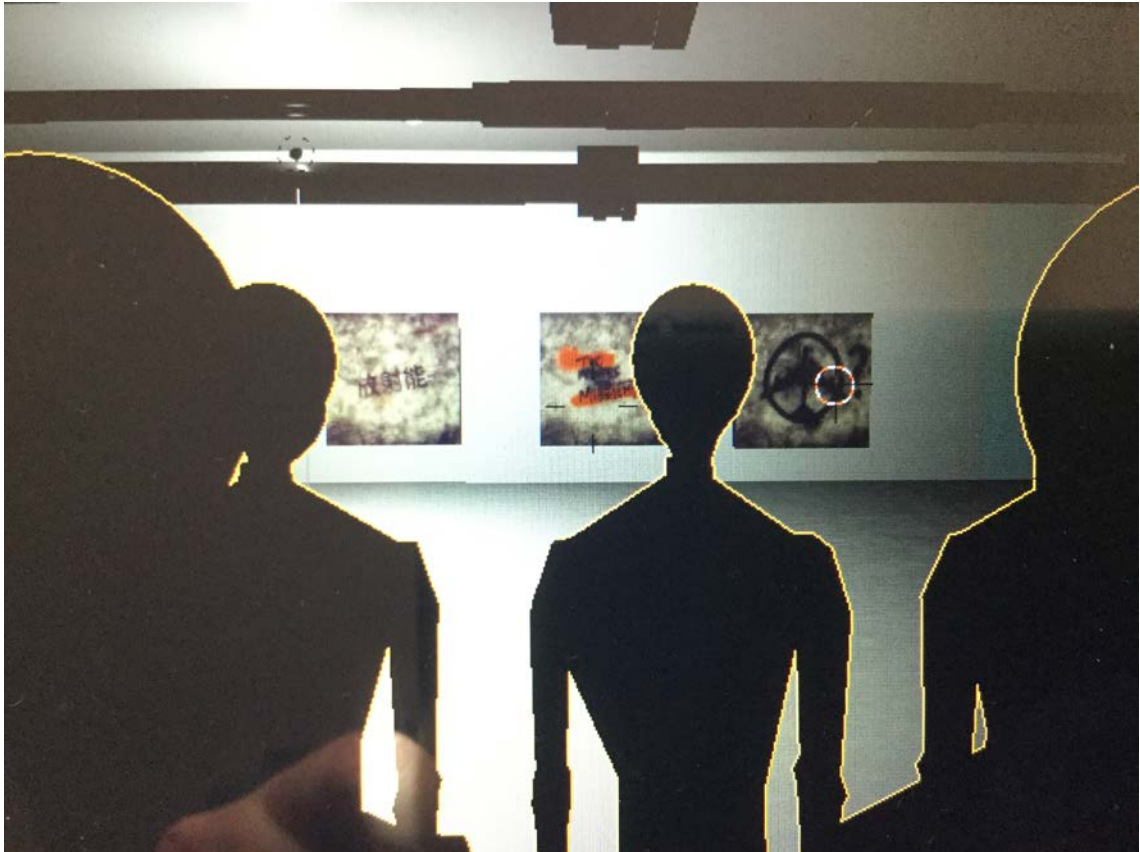
The Shadow creatures were eventually incorporated, not only as solitary wanderers, but a mass, a mob, a gathering. They have congregated in a space within the virtual world that serves them as an art gallery serves us. The Shadows are us, but in a far future where the consequences of our choices have left us a world, and an art world, of desolation and sorrow.

3.2 A Virtual Gallery

The choice of choosing flat, 2D projection comes at the cost of stereo view depth. However, a "secondary" viewing of the artwork was created for the Virtual Gallery project concurrently in development at Tampere University of Applied sciences in 2017-2018. This was a natural progression, since the three-dimensional models were already made and in use in the original installation. Liya Pirkuliyeva was instrumental in ensuring that the instructions of the artist were correctly interpreted and Ignasi Granell performed the software work. Mikael Seidler created the interface models in Blender.

This ancillary artwork is presented in a virtual space. A different scene from the main artwork is presented, as if a space had been taken over by the artwork in a more thorough sense- as if the artwork had broken the bounds of reality and converted the real world.

A long hallway is shown in 360 degrees and stereoscopic three-dimensionality. Graffiti lines the walls nearby, and ominous synthesizer music, made by the artist, plays. A lonely, forlorn piano plays over the drone and pulse of the synthesizer. The shadows- the dark, featureless humanoid beings that present humanity's future selves- fly forward into darkness. The viewer, helpless, cannot argue or persuade or stop the shadows. All one can do is wade in the dark ankle-deep water and watch. The experience is very unnerving, even to its designer.



Above: art for future people

3.3 Blender

After collider⁵ issues with Blender model imports to Unity (Blender Foundation 2018, Unity Technologies 2018), it was decided to spend some time attempting to make at least a temporary demonstration version using Blender's internal Game Engine. The process proved fruitful early on, and with the internal Blender logic editor handling the coding requirements, it was possible to delve deeper into the modelmaking and other details of the virtual world without hiring additional workforce to write code.

Blender, as the free, open-source software that does it all from modeling to logic blocks to avoid coding, became the option chosen, as there was no requirement for cutting edge graphics, and the development plan had limited resources. (The Blender Foundation, 2017)

⁵ The logic by which an object in a game is considered an obstacle. The shape that defines those collisions is called a collider.



ABOVE: A GRAFFITI "RELIC" OF OUR TIME IN THE FUTURE WORLD.

3.4 Here there be Tygers

While the virtual world was contemplated and developed, valuable feedback was received from Tamk students. Interestingly, those who played few computer games felt that it was an interesting artwork, while people with gaming experience found it to be an atmospheric, slightly frightening game.

In January 2018 a version was developed where by getting seen by the shadows triggers a "hellword" or "nightmare" scenario, after which the game restarts to an infirmary space. Conversely, approaching and activating a generator caused the world to revert to a real-world, present-day appearance: most doors are closed, the hallways are no longer gloomy and under emergency lights, the Shadows are gone and even the bunk beds and tables are

fading out. The player is free to leave the shelter, and have a brief moment at the exit/entrance. After this, the game reverts to the infirmary: as it will be set in a gallery, it is important that the artwork loops somehow, while also rewarding players for their actions.

Despite the mechanic and assets having been made and implemented, it did not ensure that any visitor will see the whole "story" in a gallery setting. Therefore, the eventual decision was made to leave the world static, without good or bad endings. The world portrayed *is* the ending, and mankind makes the choices in real life now. This would also ensure every visitor seems the same world, and witnesses the same non-linear narrative that the objects and rooms play out.

Placing the focus on narrative sets this work solidly in the camp of Narratologic Game Art. (Dixon 2007, 599-600.)

To make the space recognisable and effective, it was necessary to craft objects and furniture to populate the area. Bunks beds, spare tables and chairs, storage lockers and overhead ventilation made it clear to playtesters what the environment is: a shelter.

The guiding principle with the virtual world is the striking of a balance between an objective/challenge oriented game, and the possible lack of such constraints or enticements in an artistic approach. For instance, a game-oriented approach could include the activation of a system to make the Shadows go away, or the need for evasion of the Shadows, the failure to do so costing the "players" a resetting of the world (a return to the beginning). Conversely, the opposite was considered: making a world which does not threaten the player with any repercussions except the ambience. Nothing to fear, in a manner of speaking, but fear itself.

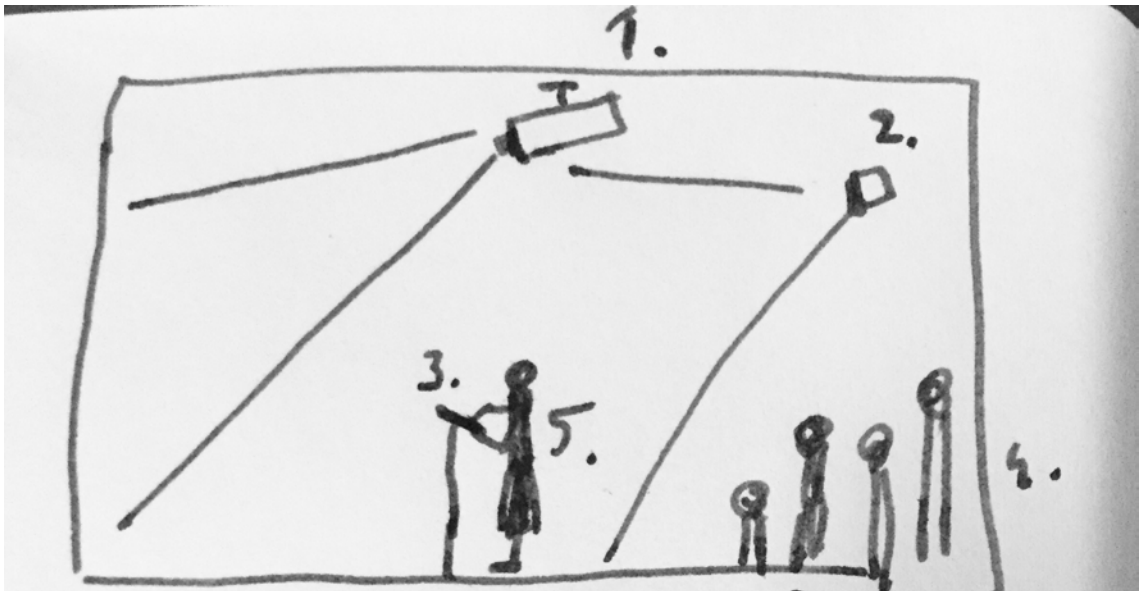
In addition, a system was explored where the player could act as a photographer: by pressing a certain button, a screenshot would be taken of the current view. This could theoretically be implemented into a script where the "photos" taken by the audience within the virtual world would be automatically posted to an Instagram account, which would then both advertise and showcase the artwork, while remaining a kind of ancillary artwork of its own. This was left out due to time constraints, but left as an option for adding at a later time.

3.5 The Pilot

The pilot is any member of the audience⁶ who is willing to control the software of the virtual world being projected.

The role of the Pilot is to function as a simultaneous editor and observer within the created virtual realm. This role is of course always fulfilled by the player of any game, but the circumstance of an art event and the presence of further (passive) observers places the Pilot in the role of a performer. The process of playing becomes a performance. (Dixon, 608-609.)

Below: a side-view of the early installation plan with a live webcam (2.)



Since the dawn of single-player home console games, there have been instances of observing someone else's process of play. The widespread adoption of high-speed internet and high-bandwidth video streaming (and video cards capable of supporting screen capture) has made it possible for the observers and player to be as distant as the connection allows, and "streamers", players who stream their gameplay have become celebrities in their own right. This new format of entertainment has spawned the creation of entire dedicated services such as Twitch.

⁶ present in the room, for now: later versions may include online participation or an average-of-a-group-input control system

It is interesting how the development of more and more convincing, artistic, and interesting computer games has created worlds that are so fascinating that the mere passive process of observation has become valid entertainment.

This blending of passive and active participation in a virtual world forms an elemental basis of the choice of medium in the case at hand: an interactive projection of a virtual world where any member of the audience may become the active player-editor, or player-pilot.



Above: A still of the virtual world with 2D "wear" effect.

3.6 Space and Time: Installation

A virtual world can be almost any that the artist wishes it to be. In this case, it is going to be an extension of a photobook on the subject of civilian shelters in Finland. However, the physical space created and the mechanics of the player-performer and the observer audience could be used for a series of artworks on several different subjects. A series of virtual dream worlds could be made, with the emphasis on ambience and conveyed emotion, in contrast to the action and reaction of traditional games. The projection and livestream could be parts of a performance, for instance live music events. Some such prototypes have been seen in the growing visual accompaniment scene of the Tampere

live music scene, as what can be seen as development of 60s oil projection and live painting.

In the case at hand, a small rectangular space was tailored into the century-old factory environment of the Finlayson factory area of Tampere. A projector was set to fill one end of the room with the visuals. An audio system with headphones produced the ambient soundscape without disturbing nearby works. Close to the projection, a table or stand holds a controller for the audience to interact with. The book was also available at the back of the room, to be browsed and read while the ambient virtual world continues to be explored.



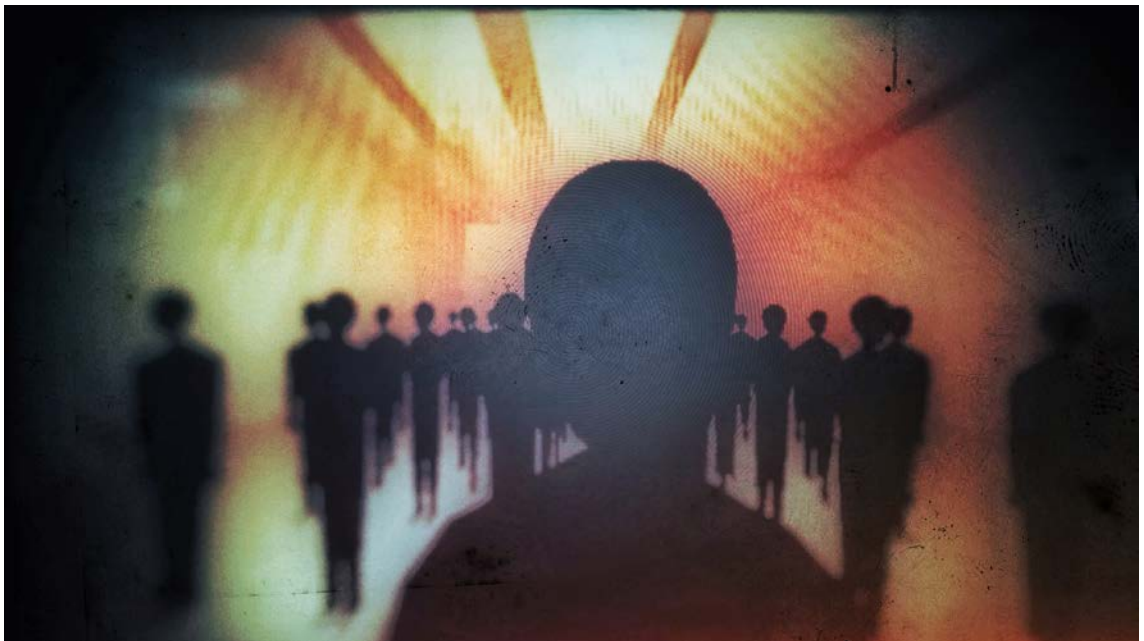
Above: a sketchbook plan superimposed on the future presentation space.

3.7 The soundscape

A crucial part of any video-based artwork, interactive or not, is the sound used (or omitted) to enhance the experience. In this work, sounds natural and expected to a large, ventilated underground space were included, as well as unnatural and foreboding synthesised melodies reminiscent of air-raid sirens.

A washing machine was recorded for the ventilation machinery sound. This sample was then slowed down to produce a slow sound of ponderous rotation. Distant, unclear speech was added to produce moments of recognition of humanity. The same "moments of recognition" will be used with the appearances of the Shadow characters that roam the virtual space.

Below: The "Hellscape" world, which ended up being not used.



4 Conclusions

Instead of producing a facsimile or virtual diorama of an existing space, the artwork adaptation became something more dreamlike in the process. It presents a somewhat nightmarish world, where our present selves have made choices that have led to the wearing out of culture and humanity.

Though the photobook is rooted in present realities and in black and white, this contrast in fact functions as a sensible part of the artwork canon: present-day items and graffiti are presented in the virtual "future" space, and the books are an artifact of the same time.



Any artwork that incorporates a video game engine or significant similarity to video games must be aware of its predecessors in both the art world and the video game entertainment realm. Otherwise the visual presentation itself will not correctly refer to previous, established narratives. (Dixon 2007, 599)

In an interactive artwork, the audience performs, though on the terms and in a space and narrative created by the artist. This is an interesting development of participative performance and a manner of democratizing the presentation of an artwork. This echoes the predictions of Prampolini in his manifesto in 1915.

Any artwork that includes audience participation without implicit printed instructions should be durable, approachable, and engaging.

Just as in non-interactive video works, the auditive components must be precisely those intended, or their absence be absolutely intended.

Artworks in VR will become more commonplace. The line between artworks and games will continue to blur. However, artistic VR and "game" experiences could be something like an interactive analogue of outsider films: without the funds to provide large productions as movies do, a single motivated artist can produce something engaging, even if somehow flawed and crude. In a way, artistic film has been the realm of such productions, where the quality of the equipment is less important, and the impressions created by the content take center stage. (Dixon 2007, 620-622.)

Blender, being open-source and free software, will continue to see widespread use not only among game designers, digital artists and VJ's, but also in fine art, outsider art, and perhaps even underground/protest applications.

Indeed, with the shoestring budget that this interactive work was created with, this case of *Deep in the Cold 3D* indicates it is by no means beyond anyone in possession of a computer of recent vintage⁷ to create virtual worlds that are compelling and realistic enough for artistic purposes, if one is willing to put in the time to learn the use of the open source tools.

⁷ 2010 or newer, running MacOS, Linux or Windows.

Below: images of the installation in use at Galleria Himmelblau.



PHOTO: ALISA KOMENDOVA



PHOTO: ALISA KOMENDOVA



PHOTOS ABOVE AND BELOW: ALISA KOMENDOVA





PHOTO: ALISA KOMENDOVA



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