Tampere University of Applied Sciences

Bringing Light Art in Digital Immersive Environment

Through the Lens of Artistic Research

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ABSTRACT

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The thesis presents the artistic research project that began alongside my artistic practice and was further developed in reflective collaboration with Tomi Humalisto and Nanni Vapaavuori. The approach used to conduct the research follows the practices and the processual character of artistic research. My individual work was the preliminary step for the common research. A virtual reality artwork that I created served as the catalyst for the research. Consequently, the creative process of the author and the audience's experience were put under examination.

The artistic research occurred in different steps and adopted various methods to meet the current objectives. The research was initiated from personal interest to reflect on the possibilities of experiencing light art in virtual reality. The urge to disseminate the reflection widely led to the collaboration with colleagues and to a colloquium presentation. Finally, the research resulted in a proceedings article from this presentation. The article has been submitted at the moment of writing this thesis report, and its publication has been agreed upon.

The article explains the process of examining the virtual reality artwork. It connects this particular artwork to a broader context of virtual reality experiences and to the philosophical ideas of Georges Didi-Huberman. It legitimises and articulates the reflexive and discursive work done during the process. The thesis report frames the whole artistic research project shedding light on the context of light art, the character of virtual reality as an experiential medium, and the field of artistic research retroactively.

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Key words: light art, virtual reality, artistic research

CONTENTS

1 INTRODUCTION

The format of my thesis for the Master's Degree Programme in Emerging Media is an article-based thesis. As stated in TAMK's thesis guidelines, this format comprises an article published in a field-related scientific magazine and a report that discusses the thesis background and context, the methods, and conclusions, including a reflection on the thesis process. Following these guidelines, this thesis report presents an artistic research process that resulted in an article. The artistic research focused on examining a specific artwork that I created for the research purposes, reflecting on the mechanisms of experiencing it in a virtual reality environment, and analysing its properties.

The first steps for this research were taken in November 2021 during an artistic residency at Maison de la spectacle La Bellone, located in Brussels. There I prepared the virtual reality artwork as an experiment to bring into the research context. The artwork became the centrepiece of the following artistic research conducted between August 2022 and August 2023 together with Tomi Humalisto, a Professor of Lighting Design at the Theater Academy, and Nanni Vapaavuori, a PhD candidate at the Performing Arts Research Centre (Tutke), both from the University of the Arts Helsinki. This thesis report introduces the creation process of the artwork to the extent that it informed the outcome of the artistic research, an article titled "Does Pasolini perceive fireflies in the balcony of the universe?" The artwork got further developed from its original version examined in this research for presentation as part of the light art exhibition Hillitön Valo, under a title "Untamed" (2023), taking place at Hyvinkää Art Museum from November 2, 2023, to January 7, 2024.

The thesis report has a following structure. Chapter 2 presents the context where I situate my own artistic practice as well as this research. I will introduce elements of our methodology and link them to artistic research. I will also define virtual reality as a media technology in relevant respects to this project. Chapter 3 presents the contents of the article in general terms and the results in relation to the premises. In Chapter 4, I analyse and reflect critically on the entire working process and provide alternative paths that this research could have taken, or a future research can take.

2 CONTEXT, MEDIUM AND METHODOLOGY

In this chapter, I contextualise the work by referring to some pioneering artists working with light, providing a background for the use of technology, and presenting artistic research as a suitable methodology to conduct context-specific research through artistic practice. I also present my own background and the objectives for the thesis. For the theoretical information, I refer to literature from the fields of light art, media studies and artistic research. I link the theory to the practice in the context of this research.

I mainly work as a freelance lighting designer for performing arts, and in addition, I create my own art installations where light is the primary element of expression. In my artistic practice, I aim to create experiences that engage the spectator, making them to reflect and understand being in the world from different perspectives. With over ten years of experience in the field, I graduated from the Theatre Academy of the University of the Arts Helsinki in 2013 with a Master's Degree in Arts (Theatre and Drama). I contextualise my artistic language within the expressive field of light art, drawing inspiration from expanded cinema and kinetic art. Additionally, I have been profoundly influenced by the artists of the 1960s "Light and Space" movement. It is through these fields that I have navigated my way to virtual reality.

My personal objective to start the study programme in Emerging Media was to acquire new expressive tools in my artistic activity while striving to develop my working methods towards a more sustainable direction. After getting familiar with virtual reality applications, I became intrigued to experiment with how my artistic expression with light could be presented within it. This meant engaging in an on-going process where conceptual and theoretical reflections are intertwined with practice. Besides expanding my own understanding, I felt an urge to involve other professionals in a dialogue to contribute more widely to the conversation on the changing media environment and emerging media forms as artistic mediums. The effort to make the work public arose from the desire to articulate the internalised knowledge achieved during the process. I believe through open discourse, the art field can be reimagined from within.

2.1 Light art at the crossroads of different media and materials

The expression with light manifests in various materials and visual forms. Artists working with light have adopted different media and techniques throughout history in favour of their artistic thinking. The potential of light has been triggering new tendencies in visual arts over the entire 20th century. The rise of colour theories and minimalistic expression in painting, the dynamic abstract films in early cinema, expansion of space in sculpture, and diffusion of the art object into the surrounding environment in installation art have paved the way for a separate expression form that we recognise today as light art (Abulafia 2016, 49-52). After examining the body of work of different artists, a common factor could be to define light as the medium of perception and of participation.

Already the pioneers of light art took advantage of the current technological innovations and invented new technical apparatus in the pursuit of fully harnessing the expressive potential of light. Whereas Laszio Moholy-Nagy (1895-1946) created kinetic sculptures where moving elements in relation to light gave a new perception of space, Thomas Wilfred (1889-1968) developed mechanical sculptures to trigger changing light formations in order to play light compositions (Orgeman 2017, 33).

Due to its influence on the corporeal level, light has served many artist who aim to offer a space for sensing to the spectator. The thinking of 1960s' "Light and Space" artists was characterised by the idea that light works are alive in their immersive environment. The spaces which the works occupied became animated by the light. The emphasis was on the experience of these spaces, rather than the art object itself. James Turrell, active since the 1960s, directs the focus with his immersive light installations to the spectator's own experience and invites to observe the effects light has on oneself. His spatial works with visual illusions manipulate the perception in an extend that one looses the sense of surrounding space. Olafur Eliasson, in turn, tricks the perception of cognitive coherence with contradicting stimuli and by doing so exposes the artificiality of the lived experience. (Abulafia 2016, 55-61.)

Taking into account the past development, one direction for the concurrent expressive attempts with light becomes apparent and intriguing to me: to reach towards the limits of experiences, whether they be otherworldly or yet unknown, and to offer access to unfamiliar states of being beyond the limits of our human consciousness and the capacity to expand our perceptual abilities.

2.2 Medium of Virtual Reality

The medium of virtual reality could be considered as a continuation to the tendency to reach beyond the borders of experienced reality. The first artistic propositions using the technology date back to the nineties. According to Paul (2003, 125), the original meaning of virtual reality was "a reality that fully immersed its users in a three-dimensional world generated by a computer and allowed them an interaction with the virtual objects that comprise that world". The immersion proposed by virtual reality is visually evoked by a head-mounted device (HMD) that seals off the observer hermetically from external visual impressions. Grau (2003, 13) places this type of immersion in the continuity of the history of visual immersive spaces, where the intention is to install an artificial world that renders the image space a totality or at least fills the observer's entire field of vision. In this definition, the concept of reality is stretched, and the artificiality is inherent for the idea of represented worlds. The "reality" is more bound to the phenomenon of taking something as real than something physically possible, mimicking the physical world and its principles. The realism is rather experiential than representational (Curtis 2016, 48). Instead, it offers experiences different from those present in our everyday lives, as seen in the works of Char Davies (Kwastek 2015, 68).

Interaction is one of the principal elements of virtual reality experiences (Tavinor 2022, 2). In addition to physical involvement, the stimulation of the participant may occur on an emotional and cognitive level. The variation depends on the type of the experience and whether it involves a three-dimensional space to move in. In these so-called "room-scale VR" experiences, one can move in a (limited) virtual space, go towards the virtual objects, look at them from different angles, walk through them, or kneel down to the floor to take a closer look at a detail. In contrast, in 360-degree experiences, the user is

always at a fixed point in the virtual world, able only to look in any direction. (Soler-Adillon 2023, 230.)

Although provoked by visual stimuli, immersion involves the entire experiencing body, encompassing various phenomena of absorption into processual experiences. The experience of "flow", as discussed by Kwastek (2015) in relation to the analysis of the aesthetic experience of interactive art, is a useful concept to understand the experiences in virtual reality as inherently embodied. Constitutive factors common to both are focused concentration on the action, loss of self-consciousness, merging of action and awareness, intrinsic motivation, clearness and achievability of goals, and control over the situation. (Kwastek 2015, 69.)

The main reason for me to begin experiments with virtual reality technology was related, in various ways, to the material qualities and the immateriality of the medium. I was intrigued by how it offers a different and more sustainable platform for presenting art (Kim & Lee 2021). Using a technology where only the interface is physical produces a significant shift in relation to the material means I am used to when working with light art. The actual artistic content is digital, allowing unprecedented fluidity in the manipulation of material and a basis to challenge all the laws of physics. It becomes possible to stage immersion literally as the diving into instances of matter. It is imagination rather than simply illusion that is called upon. It's not just transporting one self into another space but transforming of that self. (Curtis 2016, 51.)

The virtual reality artwork I created for this research is a 360-degree video featuring images of subtle light shifts that vary across a broad scale of lightness and darkness, a kind of light play in constant motion. On the contrary of a fast and active environment that constantly offers cues for interaction, the work has a slow pace and contemplative nature. No actual gaming parameters are incorporated, so participants' actions do not trigger any changes. As it is a 360-degree video, the visual content appears in two dimensions without depicting any three-dimensional space.

Curtis (2016, 62) encourages to investigate the engagement with the moving image beyond the most obvious explanations and to consider the complex manner in which representation and abstraction interact. Similarly, I was drawn to look closer at the observations and interpretations that these constantly moving abstract formations would provoke, letting the contemplative, mentally absorbing, and suggestive power of immersion affect the viewer.

What seems significant regarding my choice to experiment with the technology of virtual reality is the concept of "frame collisions" (Kwastek 2016, 73) it produces. I'm fascinated by how the state of flow can be disrupted and how the artwork can refer to the ongoing event of perception. The apparent involvement of technical equipment (HMD) in the experience, along with the ambiguous appearance of the depicted visuality, distances the viewer from the experience. Distraction, reflection and self-observation become parallel modes of observation and key aspects of the aesthetic experience itself.

2.3 Why artistic research

The relationship between art and research is not settled in the same manner as it is the case in most scientific fields of inquiry. Art is not bound by specific rules or hierarchies, it is rather identified by its singularity. This singularity makes it difficult to position within the canon of academic knowledge production and recognition, as it doesn't conform to the conventional criteria of research. Due to the lack of established languages and disciplinary frameworks, such as peer review, the possible ways to conduct artistic research are multiple. (Schwab & Borgdorff 2014, 9, 12.)

The multitude of terms used for the same field of study partly reflects the diversity within the discipline. In addition to "artistic research", terms such as "research into art", "research through art", "research for art", "arts-based research", "practice-based research", "practice as research", "practice-led research" are also common. (Hughes 2013 56; Porkola 2014, 33; Seregina 2020, 519.)

As the professor of artistic research at the Theatre Academy of the University of the Arts Helsinki describes, the push towards artistic research stems from a need to solve a problem that an artist has in relation to their art-making. They aim to unearth something new, something that has not yet taken form, based on what they already know and are skilled in. (Rouhiainen 2017, 145.) In the case of this artistic research, the project did not exist in advance, nor was it commissioned from someone. It originated from my urge to share the curiosity towards virtual reality as an environment to experience light art, to challenge the conventions I am already familiar with, and, if by doing so, to propose new understanding.

Central to artistic research is to ask how knowledge is understood and produced (Porkola 2014, 40). When talking about art and the form of knowledge it generates, notions such as "non-thought" and "confused knowledge" derived from the thinking of Rancière, are often linked to art in the discussion. These notions are related to Freud's division of the two dimensions of knowing, the conscious and the unconscious, and the question of how the act of giving meaning is distributed in between them. Unconscious or non-thought is traditionally considered in Western aesthetics as opposed to the distinct knowledge of logic. Rancière brings together the two dimensions in the process of art making, giving the space for unconscious in the production and conscious in the procedure. Thus he argues that the two modes have similar importance. (Rouhiainen 2017, 146-147.)

Thus, artistic knowledge is reflexive knowledge that is separate from yet equal to other forms of knowledge. It is formulated in the interplay of the sensible and the rational. In the artistic research, the process aims to make apparent the sensible occurring in the artistic practice and in the aesthetic manifestation it deals with or exposes. Here, the notion of "expose" is meant as the redoubling of practice in order to artistically move from artistic ideas to epistemic claims, to present artistic practice as research. Every artistic proposition needs to have the capacity to "expose" itself as research in order to create a link to academia. (Schwab & Borgdorff 2014, 15.)

The challenge of infusing art into research lies in the distribution of research between art ("practice") and writing ("theory"). From the perspective of artistic research, the dominance of written language as knowledge should be questioned. Instead, one should ask how knowledge can be constructed and proposed, and how the other media can be considered as a form of writing. Another reason why the transition from practice to theory might appear impossible is the limitation of language. Language cannot express everything (Biggs 2004, 6). Artistic research claims a reconsideration of what is understood as language. It is not limited to verbal language; all modes of articulation qualify as languages (Elo 2013, 30).

Much like other fields focused on artistic creation, lighting design lacks a premeditated framework for research. We didn't have an academic obligation from outside or a set goal from the start that would put as on a specific research path. My interest in the research was in relation to the virtual reality artwork I had created, and I was open to see which direction it would propose for us. The methodology of our research started slowly formulate through practice. We organised our work in a way we found interesting. We reflected on different ways to proceed and decided together always the next step. It was an organic process where certain activities started to repeat and functioning patterns began to appear. At the core of our work was the processual quality and the transformation over time. As Biggs (2004) proposes, the relationship between the different components of artistic research is dynamic. Varying any of these affects the appropriateness of the method, and so it is also subject to change (Biggs 2004, 14). Nonetheless, a strategy for decision-making is needed from the start.

As Seregina (2020, 518) argues, *art-based* research focuses on the process rather than the product of research, with the emerging knowledge being of a co-created and interactive nature. The topic was opened for our shared observations and discussion, and understanding emerged through continuous, reflexive interaction throughout the research process. During one year we worked on a monthly frequency in hybrid format. We followed an iterative working structure, shifting between engaging with the artwork, making observations, and reflecting and analysing those observations. We recorded

parts of our working sessions along the process in audio and video, and besides the virtual reality artwork, this documentation also became material for the research. All three members of the group did creative writing tasks based on our experiences, allowing for a more emotional engagement with research topics, as Seregina (2020, 516) describes.

We used a Google Drive folder as a shared archive to store all the gathered material during the research. The shared access allowed us to work independently on the materials at any time. The archive consists of a few hours of audio and video recordings of our viewing sessions, along with transcriptions and several dozen of pages of notes.

The interaction and cross-pollination of each other's though processes happened in various forms. We had several viewing sessions of the virtual reality artwork when we deliberately concentrated on making detailed observations on the experience. To transmit the impressions bound to the moment of observation, we made remarks at the very moment they happened. After recognising it as a valuable method of gathering information about the moment of experiencing the work, we named this practice "meta-speech". Knowing that the objective is to gather raw impressions, this method freed us from prior judgement, providing access to very different material than the one occurring after reflective and analytical thought processes.

It is important to acknowledge the inherent problem of communicating experiential content without it seeming like making decisions about the meaning of an experience (Hughes 2013, 58). These reflections are, by nature, private to the experiencing individual and strictly represent one person's point of view (Biggs 2004, 4). In our research, through repeated viewings and practicing the unfiltered "meta-speech", we intended to distance the cognitive and reflective mind, thus achieving a variety of impressions of experiential content with a representational relationship to it. As part of "meta-speech", intuitive bodily reactions also got recorded in the video documentation. Moments to stand up or to sit down, to look up, down or sideways occur without linguistic interference and can, therefore, be understood as more authentic. But this by no means removes the subjectivity of the individual.

To address the claim of objectivity, artistic research leans on feminist research as a way to legitimate knowledge. Feminist research is context-sensitive and aware of the power it employs. Similar to feminist research, in artistic research, the position of the author is examined, how an artist can be a subject producing knowledge, what this knowledge is, and what the relationship is between the researcher and the object of research. (Porkola 2014, 37.) Both artistic and feminist research emphasise the importance of situated and embodied knowledge, making visible its limited location and giving rise to another kind of objectivity. "This is an objective vision that initiates, rather than closes off, the problem of responsibility for the generatively of all visual practices" (Haraway 1991, 190).

As mentioned earlier, the creation of the virtual reality artwork preceded the period of collaborative research. The practical "hardware" part of the creation took place in a one-day recording session in my studio, with prepared circumstances and some technical tools at my disposal. This was followed by composing the artwork in its exact format in software. In the moment of creation, my attempt was to connect with the idea of light as fluid material in constant change. In practice, I examined how it moves, changes form, appears and disappears. Reflecting on the creation process and reconstructing the moment of making retroactively brought valuable information for the research. The attempt was to grasp underlying intentions and methodology that facilitated the creation for the purpose of the research.

To understand the importance of the moment of creation as a valuable time to collect tacit and embodied knowledge in artistic research, I will introduce my approach to it. In that moment, I am in direct connection with the expressive material— light. Time becomes condensed, and during this period, I allow the material affect me as I manipulate it with my actions. I orientate from the inside, trusting my feelings, both emotional and physical. As Blumenfeld-Jones (2016, 323) proposes, the artist is in immediate interaction with the world around, "words are not the heart of the work but, rather, the feelings (bodily/emotional/ sensory/intuitive/aesthetic) that lead me, feelings that are non-verbal and yet have form".

I find artistic research a helpful framework to further investigate these lived moments. I consciously enter in the state of awareness where I am freed from the pressure of having to translate sensory knowledge, in the first place, into words. This allows me to be attentive, to observe, to receive, and to respond, orientating and trusting my intuitive reactions arising in that situation. Loukola (2017, 86) describes this state very accurately: "as if letting the left-hand guide certain materialities into specific kind of 'action', while letting the right-hand listen, or at most, interfere with the process, whatever lead the material may instruct us to follow."

Artistic methods are in some way present in every phase of artistic research process. They can be utilised to gather, analyse, and/or present data (Seregina 2020, 518). Expressing the research may take various forms, occurring in connection with the artistic material in a manner appropriate for the research. Fundamentally, there is no requirement for words to be involved in the process of artistic research at any point. As Hughes (2013, 61) states, "the outcome is a distillation of a longer process of interpreting, adapting and applying information derived from various collection systems (historical, methodological, educational or technical), made available to an audience via an experience in (or across) time". The research can be brought into interaction with the audience in a multitude of ways. To measure this interaction as "successful" depends on what is supposed to be achieved through it. Following this thought, the outcomes can be considered in relation to how the exposing of the research resonates with audiences and how it is capable of generating responses and providing answers, a variety of them.

3 SUMMARY OF ARTICLE

The article that is part of the thesis is treated in this report only partly by explaining its premises and giving an overview of its contents because it will be published after the completion of the thesis report. It cannot be included here to guarantee that the results and analyses published in the article are previously unpublished. There is an agreement to publish it in the Performing Arts Research Centre's multimedia publication series Nivel as a part of CARPA8 publication in the beginning of 2024. The article was submitted on the 14th of November before finishing this thesis report. The inclusion of the article as part of this thesis was discussed and accepted by the two co-authors of the article.

The article is a proceeding text of a presentation under the same title "Does Pasolini perceive fireflies in the balcony of the universe?" that took place in Colloquium on Artistic Research in Performing Arts CARPA8 at the Theatre Academy, University of the Arts Helsinki, on the 25th of August 2023. In the presentation, we discussed the process of our research along with emerged reflections and observations.

3.1 Background

The common journey began in August 2022 when I asked Tomi Humalisto and Nanni Vapaavuori to meet and reflect on the potential of virtual reality as a platform for artistic experience. I approached these colleagues due to our shared backgrounds as lighting designers with shared aesthetic and epistemological interests. The focus of the collaboration was initially two folded, firstly, exploring the essence of a virtual reality artwork that I proposed to examination, and secondly, investigating the broader possibility of experiencing light artwork in a virtual environment.

In my prior artistic work, experiencing light as physical matter and having a sensorial response to it have been key factors for connection. Sharing the same physical space with artwork and through this getting into connection with it is, for me, one of the determinant aspects of light art. I was doubtful about how the connection between artwork and the audience happens in the context of virtual

reality, where the experience is mediated by a device, the HMD. The role of the device as "the gate" to access the aesthetic experience made me question how the encounter with the artwork is perceived and how do one respond bodily to stimulation that happens only through the visual sense.

Even after this research, the bodily state that this medium imposes on the spectator remains ambiguous to me. My fellow researchers' observations on the artwork, our shared enthusiastic reflections, and the audience reactions in the CARPA8 presentation provide proof that there is potential to explore the affects that this particular medium strongly mediates in the context of light art.

3.2 Content

The article is a documentation of the research process carried out in collaboration with Tomi Humalisto and Nanni Vapaavuori. It serves as an example of how artistic research can be conducted, highlighting its processual quality. The article introduces the methods we discovered during the process, demonstrating how the research organically developed based on the current situation and our interests at that moment. It illustrates how knowledge emerges in relation to practical work when examined closely. The article provides different viewpoints for the research topic and brings them into dialogue. It also presents a link to the philosophical thinking of George Didi-Huberman, which we found nurturing for understanding the experience of this virtual reality artwork and the interpretation of light as expressive material in it.

4 DISCUSSION

The research discussed in this thesis had various forms and transformed over time. It was informed through artistic practice and the reflective research process, utilising documentation done along the process as the research tool. An alternative way to produce text compared to traditional academic language was used. My input about the hands-on creative work gave access to embodied knowledge on how an artist orientates between premeditated actions and improvisation in the moment of creation. The observations of the two co-authors of the research informed us about the audience experience of the virtual reality artwork in question. The research brought the two perspectives into fruitful dialogue.

The work was, for a long time, very free and guided by intuitive feelings and interests. As we got closer to public presentation, we started to formulate our notions in an academic structure. The text material produced by creative writing tasks, and the gathered documentation were further analysed, and dissected observations contributed to the results of the research. It should be pointed out that our aim was not to give a definitive explanation or definition for the virtual reality experience but to offer insights what kind of response the experiential content evokes.

The language to express the research also gradually became more scientific. In the CARPA8 presentation, it still felt natural to express our observations in the first person, the same way they appear in the documentation because the presentation had a spoken language tone rather than a scientific one. For the article, we changed the perspective to third person and avoided familiar-sounding phrasing to make the language more formal for the sake of publishing the research in written format. These decisions were made intentionally, but the impact of this kind of translation process on the accuracy of certain expressions should be acknowledged.

That said, the research didn't follow the premises of artistic research fully, as a traditional academic form was mainly used to express the research. However, the results of the research were partly communicated in a multimodal form.

Parts of the original texts and some images were included in both the presentation and the article to transmit presence, emotion, and unmediated experience that we found essential for the dissemination of the research. In the colloquium, the audience was able to try the virtual reality artwork, but for the future readers of the article, it is no longer possible.

Thus, the outcome is more simple to evaluate in this case than in artistic research in its "purest form", where the expression may take ephemeral form. The article, which concluded this artistic research, can be subjected to a more traditional academic evaluation, and its dissemination can be measured by the reach through the open online platform where it will be made available. On the other hand, the role of the article as the main outcome of the research could be questioned. It could be viewed as one of many outcomes, similar to how the public presentation was one, and even the virtual reality artwork on display during the process and in the Hyvinkää Art Museum was another.

Different roles were inherent in the configuration of the project. My role as the author of the artwork under examination and the initiator of the project already put me in a different position to observe the work than my fellow authors. The research benefited from our shared experience as a lighting designers, allowing us to shift roles from the creator position to the audience position, as the practice of "an outside eye" is familiar to us all. The dialogue was multifaceted but as the group consisted of only lighting professionals we could easily get absorbed in profound conversations that reflected the many aspects of the lighting designer's work. Likely, the similar professional background made also Nanni and Tomi very intrigued by the creation process of the artwork. They could imagine the moment of creation very vividly and even proposed reenacting it themselves. This proposition stays very interesting in the light of the question how an artistic act can be deconstructed and passed forward to someone else.

This highlights the context-sensitive nature of artistic research and how it engages the researcher in the process of generating knowledge. Research is never neutral, it is always rooted in the context where it takes place and

inseparable from the individuals who are involved. The same way knowledge is always situated and this requires awareness of its origins and implications.

Even thought the role of the virtual reality artwork was very central as it was the catalyst of the research, it had a status of "an artistic try-out" and "an experiment" during the process. Although we kept the video unchanged for the period of the research, I never considered it as "a final" version. For the exhibition, I created another, a new version. Even thought we discussed some possible changes, we consciously didn't take another version under examination. We decided to follow the method of repeatedly viewing the same original version and observe how the experience of it transforms over time.

This decision is an example of how the collaboration was carried out in an atmosphere of mutual involvement and trust, open to suggestions and critic. Assessing the used methods during the process and expressing the research publicly was a shared responsibility. One way to evaluate the research is to consider its relevance to the participants. After submitting the article, we exchanged thoughts about the collegial experience and stated mutually that it was pleasant how the research evolved organically and offered new openings interesting for each of us. We were satisfied that despite the research project being outside of the professional "real" duties of some of us, we concluded it together with the article. Maybe a more structured involvement would have allowed us to go deeper into some topics, like the differences in human and machine involvement in creation process, which was now only touched upon superficially. This would require deeper investigation, and I believe it would benefit from an inquiry done through artistic research.

Doing this thesis work was a unique opportunity for me to take a step aside from my practice as artist and analyse the context where I situate my work. The literature review is not exhaustive, but considering the extent of the respective fields of light art, virtual reality and artistic research, I focused on viewpoints that felt relevant in relation to the artwork that was under examination in the research.

Creating an artwork in practice, even though initially made for research purposes, allowed me to observe the changes in the nature of the creative work when the work is to be experienced only in digital environment. Relocating resources and skills requires gaining new knowledge and different time management. Instead of material scouting in different locations, one spends hours in front of the screen texturing and rendering. A new composition of a work environment involving hardware, software, and services needs to be imagined. This effects largely in the adoption of virtual reality as part of expressive tools.

The shift to a digital environment to present art implies a substantial change in terms of accessibility as the virtual space opens up through the nearest headset. For the artist it can mean a crucial increase in time spent with the ready artwork in contrast to the conventional fast-paced exhibition build-ups. Distribution across different locations and, theoretically, to bigger audiences simultaneously becomes possible. The impact related to the organisation of the presentation benefits from great cuts, no need for resource heavy implementation and planning. From the sustainability perspective, the material impact is not limited only to the headset and its battery life though, but the whole production process, starting from the manufacturing of the headset hardware to the creation of the digital content, the life-cycle of the whole ecosystem of such an art experience, needs to be taken into account. The tendencies of the development in technology make the tools in digital realm inevitably obsolete and sooner disposable than we would wish for.

REFERENCES

Abulafia, Y. 2016. The Art of Light on Stage: Lighting in Contemporary Theatre. London: Routledge.

Biggs, M. A R. 2004. Learning from Experience: approaches to the experiential componenet of practice-based research in: Forskning, Reflektion, Utveckling. Stockholm: Vetenskapsrådet. 6-21.

Blumenfeld-Jones, D. S. 2016. The Artistic Process and Arts-Based Research: A Phenomenological Account of the Practice. Qualitative inquiry. 22 (5), 322–333. Accessed: 21.11.2023. DOI: 10.1177/1077800415620212

Borgdorff, H. and Schwab, M. (ed.) 2013. The Exposition of Artistic Research: Publishing Art in Academia. Amsterdam: Amsterdam University Press.

Curtis, R. 2016. Immersion and Abstraction as Measures of Materiality. In Liptay, F. & Dogramaci, B. (ed.) Immersion in the Visual Arts and Media, 9:40–64. United States: BRILL, 2016.

Elo, M. 2013. Notes on Media Sensitivity in Artistic Research. In Borgdorff, H. & Schwab, M. (ed.) The Exposition of Artistic Research: Publishing Art in Academia, 25-38. Amsterdam: Amsterdam University Press, 2013.

Grau, O. 2003. Virtual Art : From Illusion to Immersion. Rev. and Expanded ed. Cambridge, Mass: MIT Press.

Haraway, D. 2013. Simians, Cyborgs, and Women: The Reinvention of Nature. 1st ed. United Kingdom: Routledge.

Hughes, R. 2013. Exposition. In Borgdorff, H. & Schwab, M. (ed.) The Exposition of Artistic Research: Publishing Art in Academia, 52-64. Amsterdam: Leiden University Press, 2013.

Kim, Y. & Lee, H. 2021. Falling in Love with Virtual Reality Art: A New Perspective on 3D Immersive Virtual Reality for Future Sustaining Art Consumption, International Journal of Human–Computer Interaction. Accessed: 21.11.2023. DOI: 10.1080/10447318.2021.1944534

Kwastek, K. 2016. Immersed in Reflection? The Aesthetic Experience of Interactive Media Art. In Liptay, F. & Dogramaci, B. (ed.) Immersion in the Visual Arts and Media, 9, 66–85. United States: BRILL.

Loukola, M. 2017. In Kaila, J. Seppä, A. and Slager, H. (ed.) Futures of Artistic Research : At the Intersection of Utopia, Academia and Power, 83-92. Helsinki: The Academy of Fine Arts, Uniarts Helsinki.

Orgeman, K. 2017. Lumia Thomas Wilfred and the Art of Light. New Haven: Yale University Art Gallery.

Paul, C. 2003. Digital Art. London: Thames & Hudson.

Porkola, P. 2014. Esitys tutkimuksena : näkökulmia poliittiseen, dokumentaariseen ja henkilökohtaiseen esitystaiteessa. Helsinki: Taideyliopiston Teatterikorkeakoulu, Esittävien taiteiden tutkimuskeskus.

Rouhiainen, L. 2017. In Kaila, J. Seppä, A. and Slager, H. (ed.) Futures of Artistic Research : At the Intersection of Utopia, Academia and Power, 83-92. Helsinki: The Academy of Fine Arts, Uniarts Helsinki.

22Soler-Adillon, J. 2023. Scripting, space design and user movement in room-scale VR: Storytelling strategies to direct gesture and gaze. Body, Space & Technology, 22(1), 228–237.

Seregina, U. A. 2020. Co-creating bodily, interactive, and reflexive knowledge through art-based research. Consumption, markets & culture. 23 (6), 513–536. Accessed: 21.11.2023. DOI: 10.1080/10253866.2019.1634059

Tavinor, G. 2022. The aesthetics of virtual reality. New York, NY: Routledge.