ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL

FROM PAST TO VIRTUAL REALITIES: AN ART HISTORICAL LOOK INTO VIRTUAL REALITY AS AN ART MEDIUM

M.A. THESIS

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Department of Art History

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To my family,

FOREWORD

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June 2024

Pelinsu SELİK
(Translator)

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ABBREVIATIONS

VR	**:** Virtual Reality
AI	**:** Artificial Intelligence
AR	**:** Augmented Reality
NMA	**:** New Media Art
MCA	**:** Mainstream Contemporary Art
HMD	**:** Head-Mounted Display
VCASS	**:** Visually Coupled Airborne Systems Simulator
ADA	**:** Archive of Digital Art
CAVE	**:** Cave Automatic Virtual Environment

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FROM PAST TO VIRTUAL REALITIES: AN ART HISTORICAL LOOK INTO VIRTUAL REALITY AS AN ART MEDIUM

SUMMARY

In an era where virtual reality technologies have reached various sectors, an abundance of academic research has been done on the technological, ontological and psychological aspects of the new technologies due to their novelty and mass appeal. Notwithstanding the fact that their immense presence has notably extended into the realm of contemporary art production as an art medium, the connection between the usage of virtual reality technologies and the broader spectrum of art history is still waiting to be explored.

In order to complete this art historical exploration, this study offers an established framework categorizing the artistic properties of VR artworks. These artistic properties are: *spatial manipulation, dynamism & movement, conceptualization, interactivity* and *multisensoriality.* Then, by employing literature review, document and discourse analysis as methods, the corresponding art historical movements are systematically listed and aligned underneath these properties.

Before delving into this detailed exploration though, this descriptive study first elucidates the definition and context of VR art in this study's terms. Since this study often refers to VR as a novel medium, first the origin of the term medium is introduced through the theories of Clement Greenberg's *medium-specificity* and Rosalind Krauss' *post medium condition*. Due to the fact that VR's role as an art platform of virtually displaying artworks is quite popular, a differentiation between VR's role as a medium versus a platform in the contemporary art landscape is also discussed in this section. Following this differentiation, this study's definition of VR art gets revealed. The scope of this study is specifically limited to VR artworks that utilize head-mounted displays due to their accessibility, popularity and novelty. Therefore, other immersive technologies that are utilized in art production such as CAVE and 360-degree video are excluded.

This foundational discussion sets the stage for a brief historical overview of VR technologies. This section first talks about the early ancestors of VR technologies. VR's first application in the military as flight simulators and their adoption by NASA is therefore discussed. Thanks to the popularity of VR technologies in the gaming community with the rise of virtual gaming, the new technology has been eventually adapted by the artists of the late 1980s. Another section of this work is thus dedicated to the first artistic explorations of VR in significant establishments such as *Banff Centre for Arts and Creativity* and groundbreaking artworks such as *Osmose* (1995) by Char Davies. This historical exploration too is necessary for it reveals the evolution of the VR technologies from once a military equipment into their current status as an artistic medium.

The main part of this study is titled *Shifts Towards VR Art In Art History*. In this context, shifts can be defined as any art movement, renowned artwork, or technique

that has fundamentally transformed the way art is created in subsequent generations. These significant shifts mentioned in this study therefore eventually led to the inclusion of VR as an art medium. This study categorizes these shifts under the categories of *spatial manipulation, dynamism & movement, conceptualization, interactivity* and *multisensoriality*. The framework consisting of these headings aims at chronologically listing and describing significant shifts in art history in the context of VR art. For instance, panoramas, which astonished 19th-century audiences with their illusionary properties and immersiveness, reflect attributes found in VR art. Therefore, in the framework of this study, panoramas should be listed under the spatial manipulation category. By tracing such historical shifts, this study provides a comprehensive understanding of the evolution of art forms that have paved the way for the emergence of VR art.

Through identifying the usage of virtual reality as a medium via its past counterparts in art history, this research can possibly contribute to contemporary art historiography which cumulatively evolves from past art movements and techniques. The findings and motives behind this research reveal the evolution of diverse art mediums throughout history, broaden the public's understanding of what contemporary art is and provide valuable insights for scholars, artists, and audiences exploring the dynamic relationship between VR and artistic expression. Through this study, not only a better understanding of contemporary art but a better understanding of the relationship between art, technology and society can be ensured.

GEÇMİŞ GERÇEKLİKLERDEN SANAL GERÇEKLİĞE: SANAL GERÇEKLİK MEDYUMUNA SANAT TARİHSEL BİR BAKIŞ

ÖZET

Günümüz 21. yüzyılında sanal gerçeklik teknolojileri hayatın birçok alanında ve çeşitli sektörlerde karşımıza çıkmaktadır. Eğitim, sağlık, oyun, eğlence, emlak, askeriye ve turizm gibi sektörler, sanal gerçekliğin etkili bir şekilde uygulandığı alanlar arasında yer almaktadır. Sanal gerçekliğin etkili bir şekilde kullanıldığı alanlardan biri olan eğitim sektöründe, eğitimciler sanal gerçeklikten yararlanarak öğrencilerin ders materyallerini daha etkileşimli bir şekilde öğrenmelerini sağlamaktadırlar. Sağlık sektöründe ise, cerrahlar sanal gerçeklik simülasyonları ile ameliyat pratiği yaparken, psikiyatristler hastaların travmalarını iyileştirmek için sanal gerçeklikten yararlanmaktadır. Oyun ve eğlence sektörleri, sanal gerçekliğin en bilinen kullanım alanlarından biridir. Sanal gerçeklikten yararlanan oyunlar, oyunculara benzersiz ve sürükleyici bir deneyim sunarken, sanal gerçeklik temalı eğlence parkları da popülerlik kazanmaktadır. Yenilikçi yaklaşımları ve popülerlikleri dolayısıyla da sanal gerçekliğin teknolojik, ontolojik ve psikolojik yönleri üzerine bol miktarda akademik araştırma yapılmıştır.

Sanal gerçekliğin rağbetinin ulaştığı alanlardan biri de sanat dünyasıdır. Sanat dünyasında sanal gerçekliğin birden fazla rolü olsa da, ünlü sanat eserlerinin uzaktan gezilebildiği sanal müzeler belki de ilk akla gelen uygulamalardandır. Sanal müzeler ve galeriler sayesinde dünyanın her yerinden sayısız sanat meraklısı, ünlü eserleri evlerinin rahatından deneyimleyebilmektedir. Fakat sanat dünyasında sanal gerçekliğin tek kullanımı bu sanal gerçeklik müzeleri değildir. Günümüzde sanal gerçeklik yeni bir *medyum* olarak sanat üretiminde çağdaş bir araç haline gelmiştir. Uzun süredir geleneksel sanat üretim teknikleriyle eser üreten ünlü sanatçılar dahil birçok sanat meraklısı yüzünü sanal gerçeklikte üretilen sanat eserlerine çevirmiştir. Sanal gerçeklik teknolojilerinin günümüz sanatı üretiminde bir *medyum* olarak kullanımı yaygınlaşmış olsa da, bu teknolojilerin sanat tarihsel arka planı hala keşfedilmeyi beklemektedir.

Bu sanat tarihsel keşif, yalnızca sanal gerçeklik eserlerinin daha iyi anlaşılabilmesi için önemli değildir. Sanal gerçekliğin sanat tarihsel arka planı araştırması ile, günümüz sanatı da sanatçılar ve akademisyenler tarafından daha iyi anlaşılabilecektir. Bu araştırmanın bulguları ve amaçları sanat tarihindeki çeşitli sanat medyumlarının evrimini ortaya koyarak, günümüz sanatı kavramının ne olduğuna dair de bir perspektif sunmaktadır. Sanal gerçeklik sanatını geçmiş sanat tarihi akımları üzerinden tanımlayan bu araştırma, kümülatif olarak gelişen ve ilerleyen günümüz sanatı tarih yazımına da katkıda bulunmaktadır. Uzun yıllardır teknoloji altında gelişen birçok sanat akımı ve sanat eseri yeni medya sanatı olarak isimlendirilerek, yeni medya tarihinin bir parçası haline gelmiştir. Fakat bu isimlendirme ile sanal gerçeklik sanat eserleri, her ne kadar sanat tarihinin kümülatif evrimi içinde ortaya çıkmış olsalar da, bir bakıma ötekileştirilmektedir. Bu araştırma ile sanal gerçeklik sanat eserleri,

köklerini aldığı geçmiş sanat akımlarıyla ele alınarak günümüz sanat tarihi yazımına dahil edilmiştir.

Bu çalışma sanal gerçekliğin bir *medyum* olarak kullanımına yol açan dönüm noktalarını ele almadan önce, ilk olarak günümüzde sanat medyumu kavramının ne ifade ettiğini bu araştırmanın terimleriyle incelemiştir. Bunu başarmak için de avangart sanatın ortaya çıktığı dönemde popüler olmuş ünlü sanat kuramcısı Clement Greenberg'ün *medyum özgüllüğü* teorisi açıklanmıştır. Daha sonra Greenberg'ün teorisine karşılık Rosalind Krauss tarafından ortaya atılmış *medyum sonrası durum* kuramı tanımlanmıştır. Türkçede *medyum özgüllüğü* ve *medyum sonrası durum* olarak çevrilebilecek *medium specificity* ve *post-medium condition* terimleri sayesinde günümüzde sanal gerçeklik sanatının neyi ifade ettiği incelenmiştir. Sanal gerçeklik sanatının ne olduğunu daha iyi anlamak için araştırmanın bu bölümünde sanal gerçekliğin günümüz sanat dünyasında iki önemli rolü arasında bir ayrım yapılmalıdır. Günümüz sanatında sanal gerçeklik bir medyum ve platform olarak kullanılmaktadır. Van Gogh gibi ünlü sanatçıların eserlerinin bir sanal gerçeklik ortamında alımlanması, sanal gerçekliğin bir platform olarak kullanımına örnektir.

Her ne kadar sanal gerçekliğin bu kullanımı günümüz ana akım sanatında popüler olsa da, bu araştırmanın tanımıyla sanal gerçeklik sanatı bu uygulama değildir. Sanal gerçekliğin bir medyum olarak kullanılması, yepyeni bir sanat üretim aracına işaret etmektedir. Sanal gerçekliğin bir sanat medyumu olarak kullanılması, sanat dünyasında devrim niteliğinde değişiklikler yaratmıştır. Bu araştırmanın tanımıyla da sanal gerçeklik sanat eserleri tamamen sanal gerçeklik ortamı içerisinde üretilmiş sanat eserlerini ele almaktadır. Bu şekilde sanatçılar yaratıcılıklarını yepyeni boyutlarda ifade edebilmeye başlamışlardır. Bu çalışmanın kapsamı, erişilebilirlikleri, popülerlikleri ve yenilikleri nedeniyle Türkçede başa takılan ekranlar olarak çevrilebilecek *head-mounted display* (HMD) kullanan sanat eserleriyle sınırlıdır. CAVE ve 360 derece video gibi diğer ilgili teknolojiler de dolayısıyla bu çalışmanın dışında bırakılmıştır.

Bu temel tartışma da, sanal gerçeklik teknolojilerinin geçmişini ortaya koyan kısa bir tarihsel özet için zemin hazırlamaktadır. Bu bölüm ilk olarak sanal gerçeklik teknolojilerinin atası olarak tanımlayabileceğimiz teknolojilerden bahsetmektedir. Dolayısıyla da sanal gerçekliğin ilk askeri uygulamaları olan uçuş simülatörleri ve daha sonra sanal gerçeklik teknolojilerinin NASA tarafından benimsenmesi bu kısımda tartışılmaktadır. Daha sonra ise sanal oyunların yükselişi ile oyun topluluklarında sanal gerçeklik teknolojileri oldukça popüler hale gelmiştir. Bu popülerlik 1980'li yılların sonlarında sanatçıların da bu yeni teknolojiyi benimsemesine yol açmıştır. *Banff Centre for Arts and Creativity* gibi önemli kuruluşlardan ve Char Davies'in *Osmose* (1995) gibi çığır açan eserlerinden de bu bölümde bahsedilmiştir. Bu tarihsel özet aynı zamanda sanal gerçeklik sanatının ilk örneklerine de yer vererek, sanal gerçekliğin bir zamanlar askeri teçhizat rolünden günümüzdeki sanat medyumu rolüne geçirdiği evrimi de gözler önüne sermektedir.

Sanat medyumu kavramı ve sanal gerçeklik teknolojilerinin kısa tarihi, çalışmanın ana bölümü olan *Sanat Tarihindeki Dönüm Noktaları* başlığına yol açmaktadır. Sanal gerçekliğin sanat dünyasında bir medyum olarak kullanılabilmesi için, sanat tarihinde birtakım dönüm noktaları olmuştur. Bu bağlamda İngilizcede *shift* terimi ile açıklanmış dönüm noktası kavramı, sanatın daha sonraki nesillerdeki üretimini tamamen değiştiren herhangi bir sanat akımı, sanat eseri veya tekniğini ifade etmektedir. Bu çalışmada bahsedilen bu önemli dönüm noktaları, nihayetinde sanal

gerçekliğin sanat tarihine bir sanat medyumu olarak dahil edilmesine yol açmıştır. Bu tez, akademideki bu sanat tarihsel boşluğu doldurabilmek adına bu kırılma noktalarını incelemeyi hedeflemektedir. Bu sanat tarihsel araştırmayı ortaya koyabilmek adına, bu çalışma sanal gerçeklik sanat eserlerinin özelliklerini kategorize eden bir çerçeve sunmaktadır. Bu sanatsal özellikler de; *mekansal manipülasyon, dinamizm ve hareket, kavramsallık, etkileşim* ve *farklı duyulara hitap* olarak tanımlanmıştır. Daha sonra literatür incelemesi, doküman ve söylem analizi yöntemleri kullanılarak, ilgili sanat tarihi akımları bu özellikler altında sistematik olarak sıralanmıştır.

Örneğin alımlayıcıyı tamamen çevreleyen göz yanılmalı yapılarıyla özellikle 19. yüzyıl insanını cezbeden panoramalar, sanal gerçeklik sanatında bulunan özelliklerden önemli bir tanesini yansıtmaktadır. Alımlayıcının mekansal algısıyla oynayan panoramalar, dolayısıyla sanal gerçekliğin sanat tarihsel atalarından biri olarak kabul edilebilir ve bu çalışmanın çerçevesinde *mekansal manipülasyon* kategorisi altında listelenmektedir. Sanal gerçeklik teknolojisinin kökenleri, birçok farklı sanat ve teknoloji alanına dayanmaktadır. Bu alanlardan biri de video sanatıdır. Video sanatı, 1960'lı yıllardan itibaren sanat dünyasında önemli bir yer edinmiş ve sanatçılara yeni ifade biçimleri sunmuştur. Bu araştırma kapsamında, video sanatının dinamizmi ve sanata kazandırdığı hareket, *dinamizm ve hareket* kategorisinde incelenmelidir.

Sonuç olarak, sanal gerçeklik teknolojilerinin farklı sektörlerdeki yaygın kullanımı, bu yeni teknolojilerin teknolojik, ontolojik ve psikolojik yönleri üzerine yapılan akademik araştırmaların artmasına yol açmıştır. Ancak, sanal gerçeklik teknolojilerinin çağdaş sanat üretiminde bir sanat medyumu olarak önemli bir yer edinmesine rağmen, sanal gerçeklik teknolojilerinin sanat tarihi ile olan bağlantısı hala keşfedilmeyi beklemektedir. Bu çalışma, sanal gerçeklik sanat eserlerinin sanatsal özelliklerini kategorize eden bir çerçeve sunarak, bu sanat tarihi keşfini tamamlamayı amaçlamaktadır. Mekansal manipülasyon, dinamizm ve hareket, kavramsallık, etkileşim ve farklı duyulara hitap gibi sanatsal özellikler, ilgili sanat tarihi akımlarıyla sistematik olarak listelenmiş ve uyumlandırılmıştır.

Elde edilen bulgular ve araştırmanın arkasındaki motivasyonlar, tarih boyunca çeşitli sanat medyumlarının evrimini ortaya koymakta, günümüz sanatın ne olduğunu daha geniş bir kitleye açıklamakta ve sanal gerçeklik ile sanatsal ifade arasındaki dinamik ilişkiyi keşfetmek isteyen akademisyenler, sanatçılar ve alımlayıcılar için değerli içgörüler sağlamaktadır. Sanal gerçeklik sanatını geçmiş sanat tarihi akımları üzerinden tanımlayan bu araştırma, kümülatif olarak gelişen ve ilerleyen günümüz sanatı tarih yazımına da katkıda bulunmaktadır. Sanal gerçeklik ve sanat tarihi arasındaki ilişkiyi inceleyen bu araştırma yalnızca günümüz sanatını değil; sanat, teknoloji ve toplum arasındaki dinamik ilişkiyi de daha iyi anlamayı amaçlamaktadır.

1. INTRODUCTION

In recent years, virtual reality (VR) has acquired global popularity in various areas of life such as education, healthcare, and business with different applications in gaming, training simulations, medical treatments, and virtual classrooms. Similarly, the contemporary art world has also witnessed an increased interest in VR technologies which have brought novel opportunities for both the creation and consumption of art due to their immersive nature. With the advent of immersive technologies, the medium the contemporary artist uses and the way contemporary art audiences view the artworks have changed significantly and the term VR art has now entered the nomenclature as a novel art medium. Yet, notwithstanding the fact that there is an evident connection between art history and the inclusion of VR as a medium in contemporary art practices and despite the prevalence and the recognition of VR art, there is lack of research when it comes to exploring the art historical foundation of this novel medium.

A comprehensive art historical exploration is necessary to concur that the inclusion of VR as an art medium into contemporary art is not an entirely new phenomenon. In fact, art and art history have always been very interdisciplinary and inclusive areas of study that have welcomed various technological developments, techniques, and methods from different practices. As a matter of fact, in order for the inclusion of VR to take place within the artistic landscape, a series of pivotal moments and shifts in art history that introduced new applications in art production had to occur. For instance, one cannot fully examine the element of movement in VR art without talking about the evolution art has undergone from the dynamism in Baroque art to the Readymades of Marcel Duchamp and later the kinetic art of the 60's. Therefore, a comprehensive understanding of not only VR art but also the evolution of art necessitates a detailed art historical investigation that incorporates an established framework. Moreover, this art historical endeavor of this study with the inclusion of VR into the evolution of art story holds a particular significance for contemporary art historiography.

Before moving on to the main purpose and the contents of this study though, it is imperative to clarify what VR art really stands for. Since virtual reality is a novel definition itself, defining virtual reality art poses various difficulties. Still, it is important to clearly identify what this study's definition of virtual reality artwork entails as it consequently signifies the scope of this research. The roles VR technologies acquire in the contemporary artworld illustrates this study's definition of VR art and these roles can be roughly classified under two categories: virtual reality as a platform versus virtual reality as a medium (Andrew, 2017, para. 6). It is an undeniable fact that the roles VR acquire in the contemporary art world are not solely limited to these aforementioned categories. Yet perhaps, VR's role as a platform is one of the most popular and conventional ones.

Within the contemporary art landscape, there is a notable trend where 3D walls serve as canvases, adorned with the famous masterpieces of well-known artists. These immersive experiences of different notable artworks transport viewers into a realm where the boundaries between physical and virtual space blur, creating an interactive and captivating fusion of traditional artistry and modern technology. The integration of virtual reality technologies into the art-viewing experience has only fortified and intensified this trend where the audiences immerse themselves in a manner that transcends traditional boundaries. Perhaps, one of the most famous examples of these novel art viewing experiences are Van Gogh immersive experiences all around the world. Audiences in various locations of the world view the most famous artworks of the artist in an immersive way they have never experienced before.

This type of an immersive presentation that includes moving projections and accompanying sounds, increases the involvement of the general public with the visual arts and the accessibility of the artworks. The inclusion of virtual reality technologies to this compound enhances the enthusiasm of the spectators due to their novelty. Spectators of these virtual reality experiences use virtual reality headsets that transform them to the immersive environments of the artworks. A good example to these works using Van Gogh artworks is a virtual reality environment called *The Night Cafe: A VR Tribute to Van Gogh* (2016) by Borrowed Light Studios where the users of the Oculus Rift S can explore The Night Cafe based on the homonymous artwork of Van Gogh. Surely, the famous masterpieces that can be viewed in a more immersive way using VR technologies are not limited to Van Gogh's artworks.

Virtual reality's role as an art platform does not only help display classic artworks of the deceased artists. In the wake of the pandemic, renowned museums, curators and contemporary artists have shifted towards presenting the artworks in increasingly accessible formats by necessity. As undergraduate classes turned into Zoom meetings, the exhibitions turned to virtual reality technologies as a solace. Although VR as an art platform grew in popularity during the pandemic, the incorporation of digital media in museums and exhibitions is a longstanding practice. For instance, artist Gretchen Andrew in her 2017 article on VR's potential as a platform was already explaining exhibiting her artworks to an art dealer through the usage of VR (para. 6). However popular, it is significant to specify here that this usage of VR in the art scene utilizes the new technology only as an art viewing platform. What this means is that, virtual reality here in this sense is merely a tool for display of already produced artworks. Therefore, in the context of this study, virtual reality's role as a medium rather than a platform is explored. So, what does virtual reality as a medium really mean?

In art history, there have been thousands of art movements that have utilized various mediums. In the traditional sense, an art medium once signaled the material used in the art production. Later though, the definition of the term art medium has evolved in line with the evolution of art as well and it grew to denote more than just the material of art. Especially Clement Greenberg's studies in the 1960s starting with his essay *Avant-Garde and Kitsch* (1939) popularized and modernized the term "medium" as he introduced medium specificity theory (Trodd, 2005, p. 27). With the introduction of medium specificity theory by Greenberg, and later post-medium condition by Rosalind Krauss, the concept of an art medium has transcended its traditional understanding as merely the material employed in artistic creation. In the representational art era however, the mediums used in arts were much easier to differentiate in comparison to the present day. For example, the advent of photography as a new medium in the year 1822 totally perplexed some artists who simply could not bear to recognize it as a new art production tool. These artists, faced with the challenge of this new medium, even turned to history painting as a resort to highlight the limitations of photography.

In the year 1885, a French newspaper *Le Charivari* humorously published a caricature illustrating the rivalry between the Neoclassical artist Jean-Auguste-Dominique Ingres armed with a pencil and Eugène Delacroix of the competing Romanticism movement fighting with a paintbrush (Shelton, 2000). The rivalry between Neoclassicism and

Romanticism stemmed from their divergent ideologies, which in turn influenced their choice of artistic mediums. Neoclassicism, which was the art movement idealizing the Antiquity understanding of beauty in art production, prioritized the line and the pencil whereas Romanticism, an emotionally charged movement, necessitated color and paintbrush.

Starting especially with the 20th century though, different mediums have entered the realm of art and the variety of art mediums have moved on from a simple debate on pencil versus paintbrush or the upheaval advent of photography brought about. The metaphorical demise of the representational art era, catalyzed by seminal art movements of the late 19th and early 20th centuries, including Post-Impressionism, Cubism, and Abstract Expressionism, freed the art from the boundaries of the canvas. This ideational change in the realm of art resulted in many novel and unconventional art mediums adopted by the artists and the art viewers. As modern movements such as Surrealism, Dadaism, and Futurism emerged, artists found greater artistic communities experimenting with unconventional materials and techniques in order to explore possibilities of artistic expression. The advancements in the technology also helped the diversification of art mediums with the invention of new pigments, synthetic materials, and digital tools. In fact, the inclusion of scientific developments has never been a novel concept in art history from the invention of chromo-Iuminarism of the Neo-Impressionists to the introduction of Artificial Intelligence (AI) art. These shift in the art world resulted in the inclusion of mediums and practices nourishing from interdisciplinary practices as well. Consequently, contemporary artists these days have the opportunity of producing unique artworks with an expansive array of mediums at their disposal, ranging from traditional media like oil paint and sculpture to more unconventional forms such as video art, installation, and performance art.

One of these novel mediums and practices is the incorporation of VR technologies into contemporary art practices. Needless to say, given this trajectory of art mediums over time, the transition of VR from a technological novelty to a distinct art form appears less surprising as in this context, the integration of VR illustrates a natural evolution of art production in art history. This usage of VR therefore differs significantly from the role of VR in the contemporary art world as a platform. This study though, focuses on the role VR has acquired as an art production tool in the contemporary art landscape so as to explore the shifts towards VR art in art history.

1.1 Purpose of Thesis

The inclusion of Virtual Reality (VR) technologies into the myriad of art mediums finds its roots in art history. This integration of VR as a medium represents an art historical evolution that has been shaped by technological advancements, societal shifts, and artistic innovation throughout the centuries. From the advent of perspective in Renaissance painting to the exploration of new materials and techniques in modern art movements, art history has always welcomed new modes of artistic expression and engagement. Therefore, the purpose of this study is to explore the specific shifts in art history that has eventually led to the evolution of VR as an art medium.

It is safe to say that the growing interest in VR technologies among the artists, curators, art viewers and the critics has eventually spread out into the world of academia and the scholars. Remarkably though, as opposed to the other areas of research, Virtual Reality technologies and their integration into medical and educational contexts has gathered the most attention and acclaim. Scholars specializing in medicine and pedagogical studies now have the chance of utilizing VR's immersive applications and implications as learning environments. Within the field of medicine, VR holds immense promise for medical education, simulation, training, and patient care. Moreover, VR-based interventions are being utilized in therapeutic contexts to treat phobias, post-traumatic stress disorder (PTSD) and other psychological and neurological conditions.

Similarly, in the realm of education, VR is revolutionizing the way students engage with academic content and acquire new knowledge and skills. Educators are using VR to create immersive learning environments that transport students to historical events, scientific phenomena, and cultural landmarks. In parallel to the fact that the transformative potential of VR in medicine and education is currently taking the center stage, one of the few interactions between art and the VR technologies in the academic circles frequently occurs in papers dealing with art education and art therapy, once again reflecting the prevalence of educational and medical perspectives.

For instance, the connection between VR technologies and the art world takes place in papers dealing with the inclusion of VR in art therapy (Aldridge & Bethel, 2021). Although there are even fewer scholarly works focusing on the intersection between Art History and the utilization of VR technologies, once again these works reflect the

popularity of VR and its applications as pedagogical tools. This is illustrated by plenty of studies dealing with art and art history education through immersive learning technologies. In these studies, experts and scholars explore the power of VR as pedagogical tools and more specifically as an immersive learning platform that displays the leading artists and noteworthy artworks in a specially designed VR museum to the students of Art History.

Since one of the main perspectives of this study is to describe VR technologies as an emerging medium, it is significant to state that there are now a growing number of studies accepting this novel technology as an art production tool/medium. However, other than the aesthetic and practical applications of VR, there is a research gap when it comes to connecting VR art historically. In other words, most of the studies deal with VR's role as a platform and the actual connection between Art History and Virtual Reality's role as an art production tool/medium is still waiting to be explored in academic circles. Filling this research gap in the scholarly environments constitutes one of the main purposes of this study.

In addition to this art historical research gap, there is the issue of including new media art into contemporary art. The first coinage of the term new media art, notwithstanding the fact that it is now regarded as a movement under contemporary art, has created a general sense of confusion in the scholarly circles. Since the definition of contemporary art itself creates vague associations today, the apparent distinction between new media art and contemporary art in the historiography of art breaks the cumulative evolution of art in the written sources. In theory, art history as a principle should effectively trace the evolution of art, from its first origins in traditional representational forms to the immersive VR experiences of contemporary art. Yet, the separation of new media art under the new distinctions such as media art history disrupts this linear progress and historiography. Therefore, it is especially significant to point out the emerging points of new media art in traditional art historiography including contemporary art practices.

This thesis, by pointing out the shifts in art history even before the emergence of new media art, establishes an art historical background of new media mediums such as VR. This is not only noteworthy for a more comprehensive understanding of the trajectory of art history, but it is also truly necessary for contemporary and future art viewers to better analyze art.

Naturally, a better understanding of VR art equals a better understanding of Virtual Reality technologies that do not solely signal technological developments. One of the subsidiary purposes of this thesis is to navigate the intersection of art, technology and thus indirectly culture. Throughout history, artists have continually embraced new technologies as tools for artistic expression, pushing the boundaries of artistic possibility and challenging conventional modes of representation. Thus, VR art represents the latest chapter in this ongoing dialogue between art and technology. This inclusion of a novel technology such as this one into the artistic expression highlights a shift in culture too. Therefore, in order to fill the art historical research gap and for a better contemporary art historiography and a better understanding of contemporary art and VR, this study exploring the pivotal moments in art history that has led to the inclusion of VR as an art medium is necessary.

1.2 Literature Review

The connection between art and technology has been a dynamic force throughout the course of art history. From the earliest innovations such as the use of pigments and brushes to the newest technologies of the present-day including VR, the connection between art and technology has always been an inspiration of scholarly exploration. The relation between artworks produced using VR technologies and the contemporary art world is now more widely accepted than ever with numerous celebrated artists crafting entire pieces of art within the realm of virtual reality. Despite this increase in recognition and production, the art historical foundation of this new medium remains largely uncharted within academic circles.

Even so, it is important to signify here that while this art historical exploration remains unexplored to a great degree to this day, the 1960s witnessed an increased interest in the connection between computer generated artworks and their artistic properties. Historically, the 1960s marked a point in time when the first experiments with computers in art started their existence. One of the first academic inquiries when it comes to the use and impact of the computer on artistic creation took place in Boston Architectural Center in the year 1964 when the scholars on architectural design held the first conference (Zajac, 1964) on the relationship between architecture and computer-generated design techniques. (Panigyrakis, 2023, p.30).

While the early 1960s saw the introduction of computer art as a novel theoretical concept (Thie, 1961), authors in the mid-1960s were already exploring its possibilities as an art medium. For instance, Michael A. Noll in his essay *The Digital Computer as a Creative Medium* (1967) put his engineering background to use so as to predict the future uses of computers in art while drawing conclusions from famous artworks and artists such as Piet Mondrian and Henri Matisse and their sources of creativity.

But perhaps, the introduction of cybernetics to the artistic realm in this decade was one of the most groundbreaking incidents. "Cybernetics developed a scientific method using probability theory to regulate the transmission and feedback of information as a means of controlling and automating the behavior of mechanical and biological systems." (Shanken, 2002, pp. 155-177). Cybernetics was fundamental for the development of contemporary art as it paved the way for the inclusion of various ideas and themes that are used vastly in contemporary art today. For instance, without the automation concept that introduced the relationship between the machine and the mind, it would not be possible to talk about Artificial Reality (AI) Art today.

Cybernetics was also big among emerging New Media artists who were inspired by the boundaries between art and technology. Among them was Nam-June Paik who is regarded as one of the first video artists. In his manifesto titled *Cybernated Art* (1966, p. 24), he explained his embracive understanding of art that includes information technologies and stated not just the essentiality of cybernated art but the importance of art in a cybernated life. This appreciation of cybernetics in the 1960s, including the pioneering works of Nam-June Paik on their own, manifested itself notably in the works of Gene Youngblood, particularly in his renowned publication *Expanded Cinema* (1970).

Expanded Cinema not only emerged as a primary source for New Media Studies but it also revolutionized the art world by fostering broader recognition of video art as a legitimate form of artistic expression. Youngblood's work was also significant for reflecting the change in society with technology becoming a part of people's life now more than ever. His thoughts and predictions regarding the role technology will adapt in the future reflects various realities of today. One of these realities is of course virtual reality. It is therefore important to talk about cybernetics since according to Youngblood, in order to move on to the Cybernetic Age, individuals should not only participate in their realities, but they should recreate them physically and

metaphysically also. This environment recreation is exactly what VR art is all about in its essence. Just a decade following Youngblood's groundbreaking contributions in the 1970s, the late 1980s saw the actual virtual reality technologies and the virtual reality art come into existence and technology has started becoming a constant figure in the lives of individuals.

The 1990s especially marked a pivotal era, witnessing the transition of technology from the realms of science fiction to an integral part of everyday life. In the dawn of the decade, in the year 1990, the annual digital festival *Artfutura* came into being in Mercat de les Flors, Barcelona (ArtFutura, 1990). The specific theme and edition of this annual festival and accompanying conferences held by author William Gibson, the artist Rebecca Allen among others was of course Virtual Reality. Although the whole conference was attended by no more than 20 people, the remarks of the conference were in fact remarkable. For instance, during the conference, Spanish essayist Luis Racionero argued that the traditional forms of art such as painting, sculpture, and literature have reached their maximum potential and are no longer capable of being avant-garde. He further countered the notion of art's demise by suggesting that humanity is in fact witnessing a "marvelous beginning" with the novel technologies presented in the festival (Artfutura, 1990). In ArtFutura 1990 titled *Virtual Reality*, a VR helmet and performances utilizing VR technologies and therefore the possibility of VR as an art medium were introduced.

Later, artist Jeffrey Shaw for *The Second Annual Conference on Virtual Reality International: Impacts & Applications* (1992) held in London explained his artworks utilizing VR technologies in a statement titled *Virtual Reality: A New Medium For The Artist?* (1992). Shaw was not the first artist to explore VR's potential as an art medium. The same year, consisting of articles by scholars and interviews with artists using VR as an art medium, a book titled *Through The Looking Glass: Artists' First Encounters With Virtual Reality* was issued by Cirincione & D'Amato (1992). One of these scholars was Donna Haraway and in her short essay titled *The Materiality of Information* (1992) the author explained her first-time experiencing VR head display and compared the expectations of VR to a nuclear bomb in the sense that new technologies and the hype behind them can sometimes be in vain. The very significant idea behind her essay that is related to this study however was the fact that VR, similar to new phenomena in art history like the perspective of the Renaissance, became a tool

for knowledge production. As an example, Haraway regarded rational thought as a source of simulation and therefore stated that realistic paintings certainly created synthetic worlds. Haraway's correlation thus, clearly created an art historical connection between VR's role as a medium and its potential as a tool for knowledge production.

One of the contributors of *Through The Looking Glass* (1992), editor Brian D'Amato and artist Jenny Holzer have respectively written on VR as an art medium in their works *The Last Medium: The Virtues Of Virtual Reality* (1992) and Jenny Holzer with Kevin Teixeira, *Virtual Reality: An Emerging Medium* (1994). The mid-1990s marked the dawn of a new era with the creation of *Osmose* (1995) by the artist Char Davies. Her artwork not only led to the population of VR art in the 1990s, but her website of scholarly work written on Osmose constitutes an extensive academic archive for VR art history and therefore has been essential for this study. One of these works is *Osmose: Towards Broadening The Aesthetics Of Virtual Reality* (Davies & Harrison, 1996) that specifically explains the aesthetic properties of this artwork, especially the environment creation aspects that legitimizes its status as a VR art.

While the 1990s saw the recognition of virtual reality (VR) as an artistic medium, it also witnessed the emergence of a distinction between Contemporary Art and New Media Art which unfortunately disrupts the linear evolution of art history to some degree. For instance, most artistic advancements of different genres since the latter half of the 20th century are alas often categorized as New Media Art. Consequently, the scholarly inquiry into the history of these works typically falls within the title of Media Studies or the specific field of New Media Art History. Chris Wahl, in his introduction essay *Between Art History and Media History: A Brief Introduction to Media Art* (2013) approached the history of video art, focused on the media art's artistic elements, and talked about the variety of different areas of research encompassing New Media Art other than Art History such as History of Media Art, Visual Studies and Image Science also known as Bildwissenschaften.

Within this abundance of research branches, the role and relevance of Art History is often overshadowed. However, this does not have to be the case since the identification of Contemporary Art as an umbrella term and the inclusion of New Media Artworks under this title strengthens cumulative art historiography and leads to a better understanding of art's evolution in general. Yet, most of the scholarly works focusing

on the history of New Media Art do not refer to its antecedents. Even art historian Frank Popper's book delving into the art historical background of virtual art left out the early ancestors in art history and started his exploration from as late as the second half of the 20th century (2007, Historical Antecedents Section).

This is not to say that there are not any endeavors exploring the background of New Media Art long before the 20th century. Edward A. Shanken's work *Contemporary Art and New Media Digital Divide or Hybrid Discourse*? (2015) voiced exactly this problem and attempted at identifying both the divergences and the convergences between new media art and mainstream contemporary artworld. Shanken too highlighted the fact by stating "To its detriment, NMA (New Media Art) and its discourses sometimes display a weak understanding of art history and recent aesthetic and theoretical developments in MCA (Mainstream Contemporary Art)." (2015, p. 464).

Although this hybrid discourse and these intersections have been and currently are investigated by various scholars, German art historian Oliver Grau stands out as one of the pioneering figures thanks to his art historical priorities and perspectives. Grau's contributions to the project *Art History and Media Theorie(s) of Virtual Reality* at the Humboldt University and his article *Into The Belly Of The Image: Historical Aspects of Virtual Reality* (1999, 365-371) in *Leonardo* have played a pivotal role in laying the groundwork for understanding the early historical dimensions of VR art. His 1999 article established the illusionary walls of Pompeii and panoramas as the ancestors of VR art with mentions of Gesamtkunstwerk. Furthermore, Grau drew parallels with pioneers of film, including Stereoscope and Sensorama, elucidating the historical trajectory that paved the way for the evolution of VR as a form of artistic expression. Grau's 1999 publication also cited *Osmose* (1995) as a remarkable example to VR art and briefly explored properties of VR such as its interface dynamics and the unique sense of distance it creates. When it comes to the above-mentioned intersections between art history and media studies though, Grau's publication *Media Art Histories* (2003) calls attention to the need for implementing art historical contexts into new media art.

Oliver Grau's early explorations of art history and VR eventually transformed into his book *Virtual Art: From Illusion to Immersion* (2004) which constitutes the primary source of this study as it includes numerous art historical connections with a specific

focus on the concepts of illusion and immersion. It is especially significant for being one of the limited sources that has the motivation to connect virtual reality and art history. Grau's 2003 book establishes noteworthy examples in art history as the early pioneers of VR art starting from Antiquity. This is unique as almost none of the literature surrounding new media artworks' history draws the art historical connections before the 19th century. Although the premise of Grau's work obviously has art historical motives, it lacks revealing the actual art historical evolution of VR art.

In contrast to this study exploring the shifts in art history that has led to the inclusion of VR as an art tool, Grau's work is rather focused on the history of illusion and immersion in art history. Due to Grau's book's focus on illusion and immersion, significant art historical movements and mediums that reveal virtual reality's artistic properties that make it a fit for contemporary art are excluded from Grau's timeline. For instance, while Genetic Art, Transgenic Art and the concept of Telepresence are examined extensively owing to the focus on illusion, there is a notable omission of discussions on Dada, Surrealism which introduced groundbreaking and innovative techniques or the advent of Conceptual Art which has forever changed contemporary art tools and motives.

This study however delves into diverse aspects of VR other than illusion and immersion such as *spatial manipulation, dynamism & movement, conceptualization, interactivity, multisensory experience* and *technological advancements* so as to better analyze the evolution of art. Yet, Grau's explorations of the illusionary and immersive aspects of VR in art history contribute greatly to the spatial manipulation section of this study. Furthermore, the 2003 book highlights the assessment, reception, interaction and preservation of VR, which are out of this particular study's scope. Last but not least, it's noteworthy to observe that Grau's work naturally and primarily delves into artworks from the 1990s, a period significantly distinct from the present era where VR art has witnessed a transformative surge in popularity, accompanied by advancements in technology and an influx of new VR works. It is unfortunate to note that, other than Oliver Grau's seminal 2003 work, there are not any publications connecting VR art to art history. Therefore, this study utilizing Grau's work as a primary source while excluding the illusionary and immersive art historical backgrounds of VR art, contributes to Grau's study and therefore to contemporary art historiography with new perspectives and aspects.

1.3 Hypothesis

This qualitative study aims at describing the art historical shifts that eventually led to the recognition of VR as an art medium. The research focuses on describing and categorizing the unique artistic properties of VR artworks and aligning these properties with corresponding art historical movements. Literature review is one of the methods employed in order to review existing literature on VR technologies, contemporary art, and art history. With document and discourse analysis as methods, key documents such as artist statements and critical essays are analyzed.

Although there are a considerable number of art history movements and moments that contributes to VR's recognition as an art medium, the sampling process for this study is conducted with a focus on identifying art movements that have created a drastic shift in art production and history. For instance, the advent of perspective and photography completely changed the art production of the following generations and therefore are selected as samples. The criteria for selection of contemporary VR artworks on the other hand are based on their popularity and the artistic motivations behind their creation. The popularity of VR artworks is important because VR is a newly emerging medium. By exemplifying famous artists who usually utilize more recognized art mediums such as Jeff Koons or Marina Abramović, the status of VR as an art medium can be further emphasized and justified.

In order to limit the vast realm of immersive technologies, the focus of this study is on VR artworks that utilize head-mounted displays (HMDs). This study explicitly excludes 360-degree videos, which are often employed by filmmakers, in order to keep the art historical focus. Since CAVE (Cave Automatic Virtual Environment) systems are rather outdated and not easily accessible, artworks created in CAVE systems are opted out to maintain a clear scope.

Data of this thesis is collected from both primary and secondary sources. As primary sources; artworks themselves including artist statements and accompanying essays are chosen, in order to provide direct insights and intentions. Since this is an art historical research, secondary sources of this study are therefore the literature surrounding these artworks. The lack of written documentation of the VR artworks presents the biggest challenge for the data collection process. Since VR art is deeply connected to the internet culture though, there have been a few but remarkable online databases and

archives collecting and documenting VR artworks, including the the scholarly studies about them. These databases, which are significant for the data collection process of this study, together constitute *Media Art Archives*, initiated in the year 2023 at Hochschule für Technik und Wirtschaft (HTW) Berlin.

The first archive under *Media Art Archives* is *Archive of Digital Art* (ADA). ADA was initiated in the year 1999 by Oliver Grau whose prominent works such as *Virtual Art: From Illusion to Immersion* (2004) and *MediaArtHistories* (2007) this study often resorts to. What separates the pioneer ADA from the others is the extensive sources of both visual and literary works surrounding the digital arts. The archive includes an artist and institution index, a magazine and even a thesaurus differentiating between various confusing terms. Another archive under the *Media Art Archives* is the *Aurora ARchive*. However, since it is dedicated to artworks utilizing AR technologies only, it is out of the scope of this thesis.

The archive presenting exclusively virtual artworks is *Radiance*, also known as The International Research Platform For Virtual Reality Experiences In Art. Working closely with artists, artist collectives, the *Radiance* app helps exclusively display artworks created in virtual reality. Therefore, with its exclusive scope of VR artworks, the database *Radiance* is the most valuable to the data collection process of this study.

This study's purpose of describing the shifts in art history is realized through an analytical framework categorizing VR's five key artistic properties: *spatial manipulation, dynamism & movement, conceptualization, interactivity* and *multisensoriality*. The framework consisting of these headings aims at chronologically listing and describing significant shifts in art history in the context of VR art. As a case in point, seeing that the panoramas had astonished the 19th century audience with their illusionary properties and immersiveness, and since these attributes do also reflect themselves in VR art, in the framework of this study panoramas should be listed under the spatial manipulation category.

It is imperative to underscore here that the delineations between these artistic attributes of VR art are not rigid due to various overlaps in art history. For instance, it is quite easy to situate Cubism under the spatial manipulation category, since Cubists often played with space and perspective. Yet, Cubism also helped free the artist from the borders of the canvas. Thus, this feature of the Cubists can easily describe Cubism

under the conceptualization category. These overlaps however, do not signal to something negative but rather are indicative of the dynamic interplay between artistic innovation and technological advancement throughout art history.

Therefore, this fluidity and complexity of the boundaries between these categories reflect the rich artistic expression of VR art and the diverse influences that have shaped its evolution over time. When it comes to the content of these categories, the listing of the shifts and landmarks of art history is chronological in order to reflect and further imply the art historical focus. While it would be ideal to chronologically list these pivotal moments without breaking it into different categories, it is impractical given that art history does not always adhere to a linear progression.

This study is structured into four main chapters, each with multiple sub-sections. The second chapter titled *Definition and Context of VR Art*, delves into the evolution of the term art medium, discussing concepts such as *medium specificity* and the *post-medium condition*. It also differentiates between *VR as a medium* and *VR as a platform* before providing a description of VR art. In order to fully examine VR art, it is absolutely necessary to briefly explore the history of VR. Thus, the third chapter of this study titled *History Of Vr Art* is dedicated to the historical trajectory of VR. This is not only an intellectual necessity but it is significant for observing the evolution of virtual reality technologies from once a military equipment, primarily designed for flight simulations, into an innovative way of artistic expression. This historical overview sets the stage for the fourth and main chapter, *Shifts Towards VR Art in Art History*. This chapter is divided into sections that explore spatial manipulation, dynamism and movement, conceptualization, interactivity, and multisensoriality which all demonstrate how VR art and past art movements embody these artistic properties.

2. DEFINITION AND CONTEXT OF VR ART

2.1 Evolution of the Art Medium as a Term

2.1.1 Medium specificity

The labeling of VR as a new medium necessitates a better understanding of what the term art medium really means. Although medium specificity became a popular theory in the 1960s within the writings of art critic Clement Greenberg, the discourse on the distinctions between art forms traces back much further. As early as the 18th century, German philosopher Gotthold Ephraim Lessing in his essay *Laocoön* (1766) strongly argued against poet Horace who likened painting to poetry (Chierico, 2016, The Origins of Medium Specificity section). This ongoing debate regarding the distinctions between different art forms reflected in Lessing's work holds significant importance in understanding the intellectual development of Greenberg and it is worth noting that this discourse extended into his essay *Towards a Newer Laocoön* in the year 1940 (Froio, 2021). His noteworthy essay *Avant-Garde and Kitsch* (1939) further explored art mediums and played a significant role in shaping the discourse surrounding medium specificity in modern art theory. His concept of medium specificity was highly influenced by the emerging modern art movements of the time period, particularly those that arose in the wake of Abstract Expressionism.

In its essence, Greenberg's medium specificity meant that each artistic medium possessed its own unique qualities and characteristics and Greenberg, by employing Kantian thinking, strived for the purity of artistic mediums. The purity in Greenberg's terms was related to the uniqueness of the art mediums. Therefore, according to Greenberg, the fidelity of the art mediums to their unique characteristics, as well as the boundaries of the art mediums to which they belong, was of utmost importance. Thus, the transitions or borrowings among different art mediums were against Greenberg's idea of medium purity. Greenberg advocated for painting, sculpture, and other traditional mediums to fully embrace their unique materiality and surface qualities. As an example, what set painting apart from the other plastic arts was the flatness of the medium or in other words the "two-dimensionality" of the canvas

(Greenberg, 1959, para. 10). His emphasis on the flatness of the painting was highly related to the fact that Greenberg believed that arts by staying true to their unique features could push the art forward and in fact make it more modern. As a matter of fact, his ideas on medium purity were directly related to his thoughts on the state of modern art in his time. According to Greenberg, for the painting to be purer, it had to be abstract as it further highlighted the flatness of the medium. That was also why Greenberg truly admired Jason Pollock's action paintings with their drip techniques. Thus, Greenberg's rather infatuation with medium specificity was an effort of ultimately the modernization of the arts.

However, the reception of Clement Greenberg's theory was not completely positive. Even though they were highly influential, Greenberg's writings on art mediums also sparked some criticism. Many scholars regarded medium specificity as too strict and believed that this rigid adherence to medium specificity devalued the potential for interdisciplinary hybridity and therefore creativity in the arts. This criticism mostly occurred from the conception that Greenberg's writings were overly prescriptive. Yet, it is quite necessary here to signify that the reception of Greenberg's theory as a recommendation rather than a doctrine can benefit artists and art critics more. This approach aligns with the perspective highlighted by American philosopher Noël Carroll regarding the writings of Gotthold Ephraim Lessing on medium purity, as emphasized in the work of Trageton (2019, p. 4). According to Carroll, in his examination of medium specificity theory, it becomes evident that the theory primarily serves as a set of recommendations rather than a straightforward descriptive framework (1988).

2.1.2. Post-Medium Condition

Perhaps, one of the most significant criticisms towards Clement Greenberg's modernist theory on art mediums came from American art critic Rosalind Krauss. Krauss in her well-received book *A Voyage on the North Sea: Art in the Age of the Post-Medium Condition* (2000) criticized the theory of Greenberg by stating the impracticality and obsolescence of medium specificity in the 21st century when the boundaries between evolved art forms are not as clear. Krauss argued that artists no longer confined themselves to one medium and rather embraced an interdisciplinary approach to artmaking. By labeling Greenberg's theory on specificity and purity as

obsolete and in order to define her period, Krauss introduced the term post-medium condition. She also highlighted the extreme difficulty when it comes to identifying the materials of the mediums in the post-medium condition. By exemplifying Belgian artist Marcel Broodthaers' artworks, Krauss rebutted Greenberg's fixation on materiality by pointing out the impossibility of defining contemporary art with complex characteristics solely based on its physical attributes. In order to embrace a more contemporary and inclusive approach, Krauss appropriated the connotations of the term medium and adopted *technical support* as a concept to also emphasize the novel technologies utilized.

While Greenberg called attention to the homogeneity of the mediums, Krauss opted for heterogeneity. As an illustration to this comparison, according to Rosalind Krauss, the end of the medium specificity came definitively with the invention of television and the introduction of video art which both completely lacked a unifying core (2000). In other words, there were quite a lot of intersections between the mediums. For instance,

> "Film initially imitated theatre; photography painting; and VR imitates film. They often borrow from and lean on the conventions of an earlier medium; for example, film used the same narrative conventions as theatre, and one scene was often shot in one take." (Trageton, 2019, p. 4).

On the topic of television, the important effect Conceptual Art had on Krauss' writing is worth touching upon since it is highly related to the second subsection of this chapter. Artist and author Lev Manovich in his research article *Media After Software* (2013) further explored the role of television in the transition from medium to media (Bayraktar, 2020).

Manovich questioned the state of medium specificity in his work by exemplifying the roles television acquired in the contemporary age. In his work, he emphasized the problem of differentiating between television broadcast as mass media and video art as an art form. By abiding to medium specificity roles, it becomes apparent that the unique materials utilized in both television broadcasting and video art are "electronic signals", as both rely on these signals for their existence (Manovich, 2013, p. 37). Yet, even though both utilize mutual material properties, television broadcast is regarded as mass media for consumption whereas video art is labeled as an art form displayed

in museums. Manovich therefore invalidated the feasibility of medium specificity by emphasizing the fact that the difference between television and video art stemmed from sociological and economic dissimilarities by stating "The techniques, tools, and conventions of media software applications are not the result of a technological change from 'analog' to 'digital' media." (Manovich, 2013, p. 32). Rather,

> "They are the result of intellectual ideas by people who conceived of it in the first place, the actual products created by software companies and open source communities, the cultural and social processes set up when many people and companies start using it" (Manovich, 2013, p. 32).

In other words, context mattered. On this matter, about a decade before Krauss' post-medium condition, French psychoanalyst Félix Guattari in his article *Towards a Post-Media Era* (1990) predicted that television and computer screen would soon turn into the same being serving the same purpose (Bayraktar, 2020). Guattari's prediction has now become a reality in the 2020s. Most of the artworks now utilize coding as their unique materials and the role of television or computer screens are completely context and function dependent. Krauss' post-medium condition, Manovich's *Media After Software* and Guattari's predictions all serve a significant trajectory for this study as they all highlighted the role, function, and the context of the medium. This is because, the focus of this study is that VR is also experiencing a post-medium condition in the 2020s. In the digitized society, the role of virtual reality technologies differs significantly between everyday life, art viewing and art production. And the state of VR as an art medium is therefore directly related to the role it acquires in different contexts. That is why, here, it is highly important to differentiate between what VR art as a medium really means.

2.2 VR as a Medium vs. VR as a Platform

Virtual reality today is a rapidly changing form of niche technology with a vast presence in contemporary society. But perhaps, once a military simulation tool, VR has become a part of everyday life with its introduction to gaming communities. By giving the gamers a chance of immersing themselves in the game, VR's popularity reached new heights. In fact, VR as a technology is mostly associated with the entertainment industry today. From immersive gaming experiences to virtual theme park rides, it is safe to say that VR has transformed the way the public engage with

entertainment content. In addition to the entertainment sector, the vast usage area of VR technologies expanded into the sectors of education and medicine. Thanks to this evolution, new possibilities for leveraging VR's immersive capabilities that help enhance learning experiences and revolutionize healthcare practices have opened. These different sectors affected and highly influenced by the VR technologies reflect the everyday usages and roles of VR. But of course, the evolution of VR technologies is naturally not limited to these sectors.

As a matter of fact, in the contemporary day and age, one of the most widespread applications of VR takes place in the realm of art. The roles VR acquire in the contemporary art scene are directly linked to the post-medium condition discussed earlier. As stated above, the post-medium condition drastically changed the understanding of an art medium and basically the relevance of it. With Rosalind Krauss' writings on the matter, traditional notions of artistic mediums and their boundaries were immensely challenged and the strict categorization of artworks based on their medium became obsolete. For instance, contemporary artists today easily make use of the hybridity of different mediums which help them to create new modes of expression. Thus, it can be said that, the post-medium condition has freed the artists from the limits of the artistic mediums and has liberated creativity. Krauss' book A Voyage on the North Sea: Art in the Age of the Post-Medium Condition (2000) also discussed the inclusion of novel technologies in the process of art making.

Krauss' inclusion of new technologies and the introduction of intermediality into the debate led to the coinage of the term differential specificity. Differential specificity in Rosalind Krauss' terms was somewhat a response or a middle ground to Clement Greenberg's medium specificity. It is therefore a reinterpretation of the term medium. According to Krauss, the confusion brought by the post-medium condition can be salvaged by differential specificity (Slotkin, 2004, para. 6). By introducing differential specificity, Krauss eliminated the physical material's role in the labeling of the term medium and rather advised focusing on the artistic expression (Kim, 2009, pp. 114-123). This understanding of Krauss' differential specificity is necessary for establishing VR as an art medium. By not focusing on VR's material properties, which are basically codes, and by focusing on the artistic expression and the function the novel technology serves in the contemporary art world, VR's status as a medium can be constructed.

Therefore, the medium, which is the virtual reality technology, serving as a tool in the way of artistic expression needs to be further described. Similar to Félix Guattari's remarks in the late 1980s as discussed in the previous subsection, the introduction of computers changed the public and the scholarly understanding of art mediums completely. Meanwhile, the earliest pioneers of Virtual Reality art coincidentally conducted their experiments in the late 1980s also. Therefore, Guattari's predictions regarding the post-media era were synchronous with the early ancestors of VR art. By considering the evolution of medium specificity into the differential specificity in the post-medium condition supported by the writings of Guattari and Manovich, a contemporary interpretation of the term medium can be adapted into VR art. Since the function of the medium is highly important in understanding the artistic status of VR, it is important to differentiate further between VR's role as an art medium versus art platform as they support and reflect Manovich's ideas fully.

In the contemporary art world today, there are various spaces for VR to exist and evolve. Yet, the prevalent and commercialized understanding of the term VR art mostly refers to the existent works of art displayed in immersive environments. By the use of VR headsets or other advanced technologies, art viewers engage themselves in these artistic immersive environments. The most famous museums of the world now make use of VR in their collections in order to engage the public's attention and increase accessibility. For example, the Louvre Museum in the year 2019 carried out the project Mona Lisa: Beyond the Glass which was part of the Leonardo da Vinci Exhibition (2020) honoring the 500-year anniversary of the death of Leonardo da Vinci (Louvre, 2021). With the extension of Mona Lisa (1503) into virtual reality, Louvre gave the visitors a longer time to engage with the artwork which is not always possible in a museum as visited as the Louvre.

Of course, when talking about immersive exhibitions, it would be a shame not to mention again the prevalence of Van Gogh immersive experiences all around the world. In Van Gogh: The Immersive Experience (2017) in London for example, the experience not only serves immersive walls decorated with Van Gogh's most famous artworks, but the VR experience it accompanies transforms the audience into the paintings themselves. Van Gogh's 1888 painting Bedroom in Arles as well as the most expected The Starry Night (1889) invite the art viewers to an immersive experience. The immersiveness element has become such a part of everyday reality that there are

now museums with virtual reality collections and without actual physical structures. For instance, owned by George and Ilone Kremer, Kremer Museum of Netherlands has a collection of artworks that only be visited via VR (Brooks, 2019, pp. 46–50).

There are multiple benefits to this popular usage of VR technology. One of these benefits is related to the accessibility and the democratization of art. Accessibility issues especially emerged during the pandemic when art viewers could not even visit the museums in their hometowns. American artist Gretchen Andrew, even before the pandemic, experienced this problem and her solution to the hindrance was no other than VR. When an art critic could not make it to her art studio in London, Andrew found the solution of resorting to VR technologies to create a virtual exhibition of her artworks. In her 2017 article though, when explaining this virtual studio visit, Andrew differentiated between VR's role as an art medium versus art platform (para. 6). So, Andrew's virtual studio visit served as an art platform along with the previous examples of museums utilizing VR technology. For VR's role as a medium, the artist stated as follows: "Not only a technical platform for sharing artwork, virtual reality is also a medium with medium specificity including responsiveness to the viewer's movements, interactivity, 360-degree immersion, and the ability to displace the viewer from context." (Andrew, 2017, para. 6) By connecting the previous section to Andrew's distinction between virtual reality as a medium and the platform, the context of VR art in the terms of this study can be further established.

2.3 VR Art

VR as an art medium as understood by the previous discussions uses the novel technology as a tool for artistic expression. This study accepts VR as a new medium. But rather than abiding by the strict rules of medium specificity, this study utilizes the term medium in the post-medium condition as differential specificity. Thus, by not rejecting the need to point out unique characteristics of a novel medium, it elects the materiality aspect. Accordingly, the characteristics of VR that assists artistic expression are categorized under main titles and their reflections in art history are described in order to include VR as a medium into the discourse of art history.

So, what does VR art consist of? In the context of this study, it is first important to differentiate the technological aspects of VR art. Even after the differentiation between VR as a medium, there are now various immersive technologies that are put to use in

the art world. Yet, all these prevalent technologies in the digital era do not make VR art, at least in the terms of this study. One of the most popular forms of immersive technologies is the 360-degree video. Although it is regarded as one of the most creative novel technologies of this day and age, and despite the general likening of the two, 360-degree video differs significantly from VR. While it is true that it is possible to view 360-degree videos with VR headsets, 360-degree video art does not equal VR art.

One of the key distinctions between these two technologies is the lack of immersion and interactivity of 360-degree video art. 360-degree video in its essence does not provide the viewers with the virtuality and does not create a virtual environment. It is simply recordings of images and videos captured from different environments. In contrast to VR, 360-degree videos do not provide interactivity and the viewers straightforwardly watch the pre-captured scenes asynchronously. This contrasts with VR where the participants have the chance of moving freely in the virtual environment. Another difference between 360-degree video and VR is related to the temporality. The temporal control of the 360-degree video is owned by the filmmaker whereas VR offers a more individualized experience and duration of the VR experience is all up to the viewer. These aspects reveal that 360-degree video is a form rather more suited to the area of film. That is accordingly why it is mostly the filmmakers and photographers who utilize 360-degree video in their works rather than visual artists.

VR with its of course virtuality also differs significantly from immersive technologies such as CAVE. CAVE, a much less accessible technology, simply put, creates what VR does in actual reality. In other words, VR and CAVE depart from each other in the ocular sense. While VR uses a very advanced binocular technology for the eyes, CAVE presents projection of the images into the surrounding walls of the video theater. Here, it is important to introduce the term HMD (Head-Mounted Display). In the context of this study, VR specifically refers to virtual reality experiences based on head-mounted displays as most contemporary and popular cases of VR art utilize HMD technologies as they are more accessible due to their prevalence in the gaming communities.

Last but not least, it is also important to differentiate between the current popular technological terms in contemporary art as they are often associated together: artificial intelligence (AI) and augmented reality (AR). Even though they are thematically

linked to virtual reality as a concept, they are fundamentally very different from each other. AI, in simplest terms refers to the simulation of human intelligence in the contemporary age (Broadbent, 1992). Even though it is completely possible to create virtual reality environments using AI technologies, since this study deals with artworks of the artists utilizing VR as a tool for artistic expression, they are out of the scope of this research. Compared to AI, AR as a technology is much closer to VR in its most basic sense. Yet, the key difference between AR and VR is the full immersion. As the name of the technology suggests, augmented reality refers to the inclusion of novel technologies into the actual reality. Since immersion is a crucial and indispensable aspect of VR, AR also lacks the features this study deals with. The extent of this study is therefore artworks created fully in virtual reality. The artistic properties of VR art will be discussed in the later sections of this study in more detail.

3. HISTORY OF VR ART

3.1 A Brief History of VR Technologies

VR's Early Ancestors

Before delving into the artistic applications of VR, briefly exploring the arrival of this new technology is necessary in order to better emphasize and demonstrate the evolution from once a technical innovation into a medium. The term virtual reality was coined by American computer scientist and visual artist Jaron Lanier in the year 1987 (Berkman, 2018, Definitions section). The first scientific development significant for the evolution of VR though was the discovery of the stereopsis by Sir Charles Wheatstone in 1838. With the introduction of stereopsis, the binocular vision that leads to a three-dimensional perception was understood. Stereopsis as a concept is therefore especially important for the development of VR since the basic ocular technology behind virtual reality needs this scientific understanding to exist. The discovery of stereopsis later evolved into Stereoscope in the same year. Using stereopsis, drawn out images were placed in front of the viewer's eyes. One year later, with the invention of daguerreotype by Louis-Jacques-Mandé Daguerre, photographs replaced drawn images of the Stereoscope (Berkman, 2018, Mechanical Precursors section)

The term anaglyph was introduced in the year 1890s by Louis Ducos du Hauron who was the inventor of color photography. Anaglyph fundamentally meant the creation of 3-D visuals with contrasting colors, usually red and cyan, with the help of colored filters of the eye (Zone, 2007, p. 112). Subsequently, the anaglyph method evolved into commercial and well-received 3-D films in the 1920s. Now lost *Power of Love* (1922) was premiered as the first 3D feature film (Zone, 2007, p. 1). Moreover, the screening of the film *Bwana Devil* (1952) with polarized glasses which operate on the same technology, remains an iconic photograph in history (Figure 3.1).

Figure 3.1: Premier screening of the *Bwana Devil* (1952) [URL-1]

Before there were ever virtual technical endeavors though, virtual reality as a concept was first introduced in the year 1935 by the American science-fiction writer and scientist Stanley G. Weinbaum (Barnard, 2023). In the story *Pygmalion's Spectacles* (1935) by Weinbaum, the protagonist of the story named Dan Burke, travels to another reality by wearing special goggles. In the story Albert Ludwig, the doctor who invented the goggles, defines the technology as "a movie that gives one sight and sound [...] taste, smell, and touch. [...] You are in the story, you speak to the shadows (characters) and they reply, and instead of being on a screen, the story is all about you, and you are in it." (Norman, n.d.). In this science-fiction story, the main character even confuses realities and falls in love with a character in the fictional reality. As even the first science-fiction dealing with virtual reality suggests, the problem and aspect of immersion has always been a recurrent figure in the discourse.

Two decades later than Weinbaum's *Pygmalion's Spectacles* (1935), the immersion element of the cinema was strengthened in the year 1952 with the invention of Cinerama by the film pioneer Fred Waller. With Cinerama, curved and enormous screens reinforced the immersion

of the cinema. In 1956, American filmmaker Morton Heilig invented Sensorama. Patented in the later decade, Sensorama can be briefly defined as the prototype of the CAVE technology. Heilig's Sensorama fit four people who could experience with all the senses such as a vibrating chair, speakers, and a 3-D screen (Barnard, 2023). Heilig's invention, resulting from his cinematic background, was first described in his paper titled *The Cinema of the Future* (1955). Sensorama was not the first immersive invention Heilig contributed to the science and film circles. The first HMD named the *Telesphere Mask* was also patented by the filmmaker in 1960.

His projects combining all the senses of the individuals finally evolved into his *Experience Theater* in the year 1969. Similar to the Sensorama in the basic sense, Experience Theater extended the space of Sensorama into a whole theater. Even though Heilig's HMD was a pioneer, it lacked the motion tracking process of the *Headsight* created in the year 1961 by the engineers Comeau and Bryan in order to observe dangerous situations from a distance. Later, computer scientist Ivan Sutherland's *Ultimate Display* created a virtual reality which enabled the participants with the object interaction system. His 1965 paper titled *The Ultimate Display* remains a foundational framework for VR today as it provided the software to create the virtual environments synchronously. Sutherland and his student later went on to design the HMD called *The Sword of Damocles* (1968) which worked connected to a computer and not a camera.

An important name for both the development of VR technology and the VR art was Myron Krueger who created The *VIDEOPLACE* in 1975. Krueger had been working with "artificial realities" throughout the 1960s and his studies finally resulted in the groundbreaking laboratory VIDEOPLACE. The key element Krueger's work contributed to the virtual reality technologies was the introduction of interactivity to the area and VIDEPLACE is still regarded as the pioneering example of a mirror world. (Berkman, 2018, Mirror World section). However, Krueger's contributions to the field were not limited to technological inventions. Myron Krueger's scholarly works such as his article *The Artistic Origins of "Virtual Reality* (1993) talked about the significant role artists played in the development of virtual reality technologies.

From Battlefields to Outer Space

Although the prototypes of the flight simulators utilizing VR technologies were mostly initiated at the end of the 1960s, the 1970s were the years when the integration of VR into military use took place. McDonnell-Douglas Corporation welcomed the VITAL helmet, an HMD

employing VR technology and a head tracker following the pilot's eye movements (Barnard, 2023). Within the advancements in VR in the military domain, regarded as the grandfather of virtual reality, electrical engineer Thomas Furness has been a prominent figure. Furness worked for the U.S. Air Force throughout the 1960s and in the 1970s he adapted virtual interfaces for flights (Lowood, 2024, Education and Training section). In the year 1982, Furness' works resulted in the *Visually Coupled Airborne Systems Simulator* (VCASS), also known as Darth Vader helmet due to apparent visual resemblances (Bye, 2015).

Another pioneer for the development of VR was Thomas Zimmerman. Zimmerman and Jaron Lanier started VPL Research, Inc. which was among the first companies to introduce and market VR equipment such as gloves and goggles. (Barnard, 2023). One of these products was the revolutionary Data Glove which aided the expansion of VR into the mainstream popularity and adoption. Throughout the 1980s, many scientists and engineers contributed to Thomas Furness' work. For instance, British Aerospace upgraded Furness' Super Cockpit to include speech recognition. In the year 1991, the flight simulators were adapted by the NASA scientists. One of these scientists was Antonio Medina who designed a Computer Simulated Teleoperation system which helps transfer robots to Mars. The military usage of VR later evolved into the exposure therapy for PTSD in war veterans in the year 1997.

The Rise of Virtual Gaming

While the military use, NASA projects and the flight simulators dominated the 1980s, 1990s were all about the integration of VR into the games and the entertainment industry. Dr. Jonathan D. Waldern at the Computer Graphics 90 exhibition demonstrated a VR arcade machine called *Virtuality*. This machine titled *Virtuality* later evolved into a company owned by Waldern. Virtuality became rather widespread in the 1990s as they enabled users to experience and play in a three-dimensional universe. Virtuality later provided multiplayer games and eventually mainstream arcade games such as *Pac-Man* were transformed into the VR. In 1991, the same year as Virtuality, Japanese video game company SEGA introduced the *SEGA VR* headset, but it was never released. Later in 1994, SEGA released *SEGA VR-1* which was another arcade machine utilizing VR. Nintento threw in SEGA's lot with the discontinuation of the Virtual Boy console.

The new millennium with many expectations experienced shortcomings and disappointments when it came to virtuality. According to Thomas Furness, the grandfather of virtual reality, the early 2000s up until the year 2012 could be labeled as the winter of VR (2014). This is because there was not any mainstream use of the VR technologies in the time period. During the years leading up to 2012, one of the biggest introductions was the Google Street View in 2010. In the year 2012 Google included a stereoscopic and three-dimensional mode to the Street View. This year also marked the end of the "VR winter" as Palmer Luckey introduced the prototype for the Oculus Rift and it was later bought by Facebook in the year 2014 (Berkman, 2018, Consumer VR section). Various companies including Google, Sony, Samsung, HTC, Apple and Amazon followed Facebook with their VR endeavors. In 2023, Apple Vision Pro was introduced and its features were admired by the mainstream audiences.

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3.2 The Pioneers of VR Art

In order for this chapter to fully embark on a journey of VR's history, it is important tracing the evolution of VR finally into an art medium. As the previous section explored VR's applications in military, health and gaming, this section focuses on the history of virtuality's artistic perspectives.

According to *Radiance*, the introduction of virtual reality into artistic circles as a practice started in the late 1980s. It was in fact in the year 1989 when the seminal partnership between Monika Fleischmann & Wolfgang Strauss resulted in the VR artwork *Home of The Brain* (1989-91) and it is regarded as the first VR installation today (Figure 3.2) In Fleischmann & Strauss' work, virtual houses of the scientists Joseph Weizenbaum and Marvin Minsky with philosophers Paul Virilio, and Vilém Flusser represent "buildings of thought" (Fleischmann, 2019, para. 2). In a public virtual library, these four intellectuals own virtual buildings and debate on the future of humanity within the proximity of thinking machines. For example, the participants visiting Marvin Minsky's house is welcomed with the statement that individuals are only experiments

in this life and should take pride in this fact whereas Vilém Flusser's building of thought highlights his dream of a fluid house with constantly changing ideas as walls (Home of the Brain, 1989-91). It is easy to see that even the first employment of the new medium in the late 1980s had an intellectual purpose and the medium was used as a tool for artistic and conceptual tool.

Figure 3.2: Monika Fleischmann & Wolfgang Strauss, *Home of The Brain*, 1989-91 (Kluszczynski, 2012)

Concurrently in the year 1989, American artist and research fellow Nicole Stenger embarked on an artistic VR journey at the The Human Interface Technology Lab (HITLab) in the University of Washington. Stenger's studies at the HITLab eventually evolved into what she refers to as "the first VR movie" *Angels* (1989-92) (Popper, 1993) Nicole Strenger labeled her piece a movie for a reason (Figure 3.3). Although Angels constitutes a VR artwork by today's terms, in comparison to the other pioneers of the genre it presented limited interactivity to the audience. In other words, the narrative progressed as the rather passive participants watched. Set within a virtual universe, Angels narrated the story of two otherworldly beings uniting and completing each other by creating a new creature (Morie, 2012).

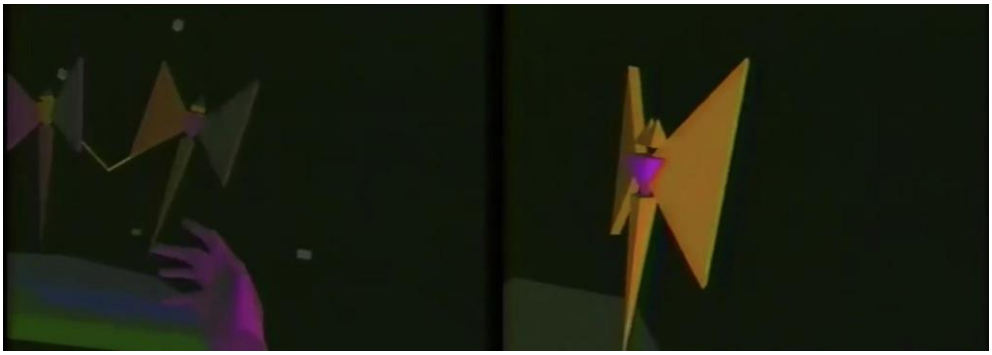

Figure 3.3: Excerpt from Nicole Strenger's *Angels* (1989-92), Adapted from *Youtube* by ISEA Symposium Archive Videos, 2021

Banff Centre for Arts and Creativity

During the early 1990s, VR equipment was not easily accessible to the artists themselves due to the unfortunate costs and the lack of mass production. Therefore, many artists worked under various companies and institutions such as VPL Research Company owned by Jaron Lanier. One of these institutions is the government funded The Banff Centre in Alberta, Canada. From 1991 to 1994, the center produced a combined total of nine VR artworks under the *Art and Virtual Environments Project*. (Doyle, 2021, p. 4).

One of these VR artworks was created in the year 1992 by Lawrence Paul Yuxweluptun, who dedicated his professional life into creating artworks dealing with environmentalism, contemporary Indigenous history and colonialist suppression of First Nations peoples (Duffek & Willard, 2016). The artist easily transformed his themes into the virtual universe with his artwork *Inherent Rights, Vision Rights* (1992) (Figure 3.4). Yuxweluptun's VR art was significant for it being the first VR piece displayed at the National Gallery of Canada (Szawlowski, 1997). In the creation of the VR universe, the artist resorted to the digitization and the transformation process of his own artworks into virtual forms. *Inherent Rights, Vision Rights* (1992) essentially represents the recreation of a spiritual ritual and it is directly linked to postcolonial identity politics. In this VR piece, the participants of the artwork experience a ceremony in a Native Canadian *Longhouse* as the spirits that inhabit the virtual island haunt them. Yuxweluptun, by letting the audience experience the traditional ritual and the state of being possessed by the ceremony with VR, aims at co-working with technology which has been continuously employed in opposition to the Native Canadians for centuries.

So much so that, the artist in a short essay describing *Inherent Rights, Vision Rights,* referred to the HMD as "a white man's mask" as the participants in order to experience this culture had to acquire a new set of gaze. (Yuxweluptun, 1992). The mask as a concept carries especially important connotations in a Native Canadian artist's work. Thus, Yuxweluptun by labeling the HMD as a mask, aimed at highlighting the technological primitiveness of the technology and predicted the display of these primitive goggles in future museums (1992). Yuxweluptun's work at Banff Centre showed the early employment of Virtual Reality as a conceptual tool that can explore postcolonial and spiritual themes.

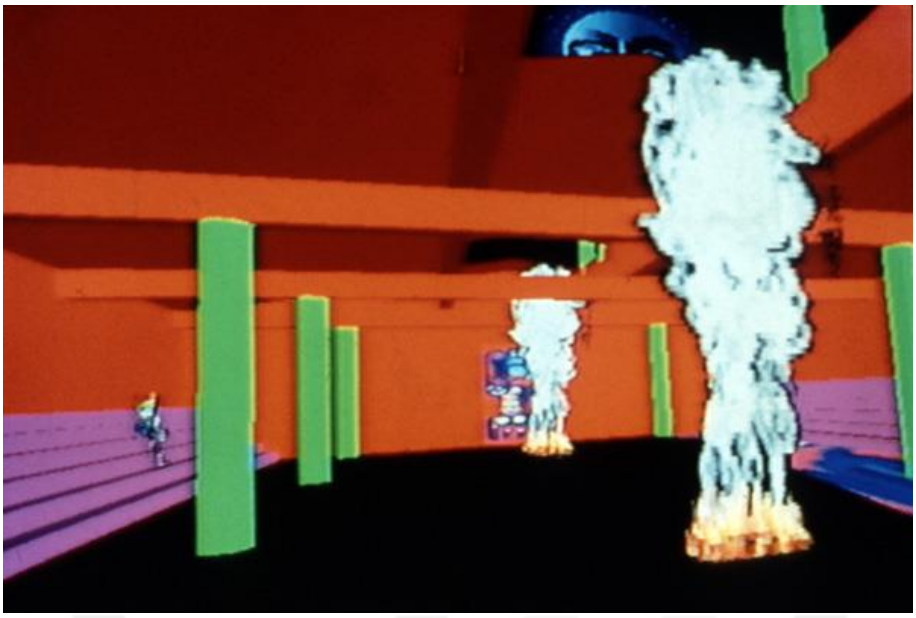

Figure 3.4: A Frame Grab of Yuxweluptun's *Inherent Rights, Vision* (1992) [URL-2]

Just a year following Yuxweluptun, artists Brenda Laurel and Rachel Strickland introduced their artwork *Placeholder* (1993) under Banff. Similar to Yuxweluptun's work, *Placeholder* (1993) included elements from the aboriginal culture and it incorporated real-life locations in Canada (Laurel et al., 1994, p. 118). What set this artwork apart from the other ones was the inclusion of marks the participants left along the experience. In fact, Laurel & Strickland's experience included the unique *Voicemark* technology which as the name suggests allowed the audience to leave voice marks as they experienced the world. In the piece, two remote participants were able to meet in the virtual reality simultaneously, each wearing their respective head-mounted displays. Although *Placeholder* (1993), as the the title suggested, aimed at allowing the audience to leave their marks on the virtual universe, it is ironic that VR headset version of the experience is now lost though the video and images captured from the experience survives (Figure 3.5) (Laurel et al., 1994, p. 118).

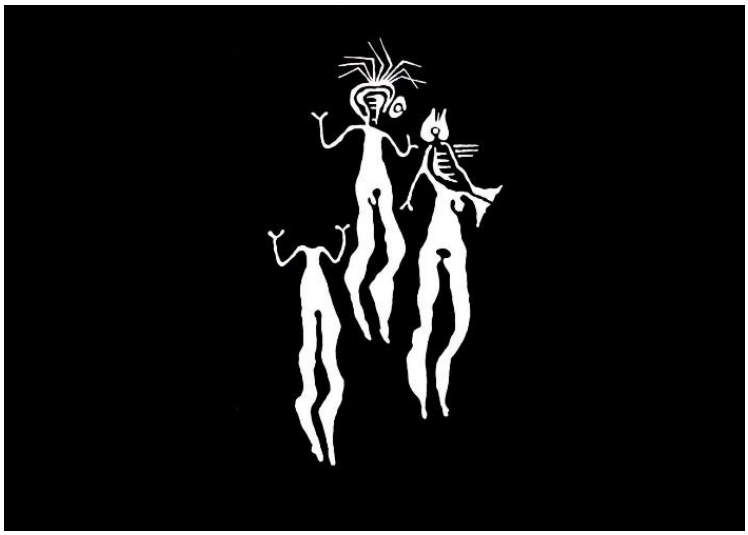

Figure 3.5: Excerpt from *Placeholder* (1993), Adapted from *Vimeo* by Rachel Strickland, 2011

The ability of leaving marks in the virtual environment was once again utilized the following year by Ulrike Gabriel and Bob O'Kane, in the VR piece *Perceptual Arena* (1994) with the support of Silicon Graphics B.V., Tokyo ART LAB and the Frankfurt Institut für Neue Medien (V2_, n.d.) (Figure 3.6).

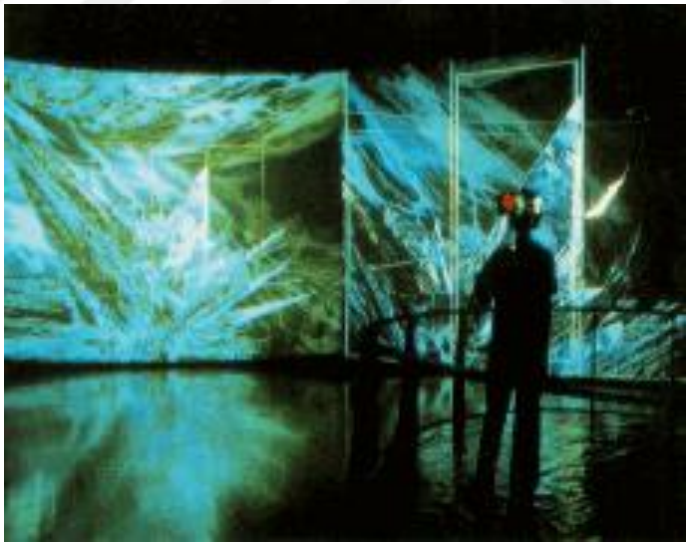

Figure 3.6: Ulrike Gabriel and Bob O'Kane's *Perceptual Arena* (1994), Photo by Kai Frike

Another pair exploring VR art at the Banff Centre consisted of Toni Dove and Michael MacKenzie (Figure 3.7). Together they created *Archaeology of a Mother Tongue* (1993). The intriguing aspect of this VR art piece was its unexpected transformation into a murder mystery.

The virtual universe created by Dove and MacKenzie consisted of three environments: a Piranesi prison drawing inspired dream, a plane which has the shape of a human ribcage and hand made of copper wire that stores memories (Dove, 1993). In line with the creator of *Angels*, Nicole Stenger, Dove in her short essay described *Archaeology of a Mother Tongue* as a part movie, part performance. In fact, according to Dove, "Archeology of a Mother Tongue started as a conversation and was conceived of initially as a multimedia theater piece" (Dove, 1996). Dove's VR art was unique not only for its murder-mystery elements but also for its distinctive length. Unlike other VR experiences of that era, Dove's work lasted nearly 40 minutes, making a significant contribution to research in the field.

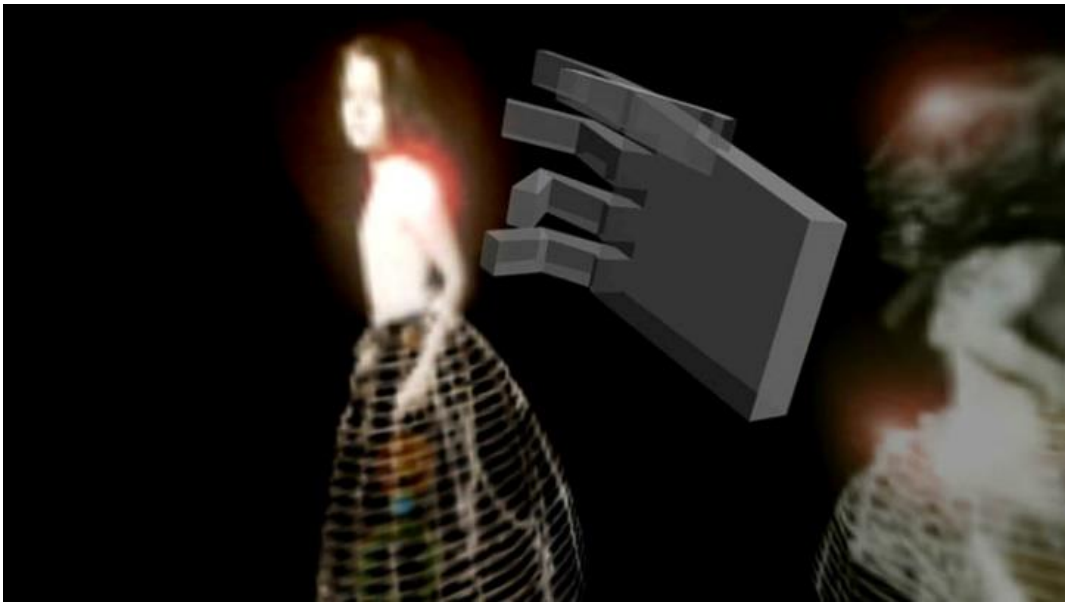

Figure 3.7: Prologue from *Archaeology of a Mother Tongue* (1993) courtesy of the artist

Among the noteworthy VR artworks created at Banff, VR performance *Dancing with the Virtual Dervish: Virtual Bodies* (1994) is worth mentioning. The 1994 artwork was created in collaboration with the artist Diane Gromala, choreographer Yacov Sharir, and musical composer Russell Pinkston (Gromala & Sharir, 1994). Since it was also a tremendous theatrical production with great technological demands, it required extraordinary funding from the National Department of Communication in Canada as well as the Banff (Gromala, n.d.). Gromala's and the contributors' piece was not only celebrated performance-wise. The artwork's introduction of *embodiment* into the VR artworks as a theme was also groundbreaking.

Embodiment as a concept is quite significant to the area. In its most basic sense, embodiment can be defined as the replacement of the actual physical body with a virtual one along with the feeling this transition creates in the users. Embodiment's first-time employment as an artistic theme as early as 1994 is therefore of importance since embodiment as a theme is now one of the most explored subject matters in VR. Embodiment as a theme in VR art *Dancing with the Virtual Dervish: Virtual Bodies* (1994) showed itself quite fundamentally as the virtual world was created from the MRI scans of Gromala's spine among other body parts (Figure 3.8).

Figure 3.8: Still from *Dancing with the Virtual Dervish: Virtual Bodies* (1994) courtesy of the artist

Osmose (1995) by Char Davies

While the Banff Centre and artists as contributors paved the way for the introduction of VR as an artistic medium, *Osmose* (1995) by the artist Char Davies made an overwhelming impression (Figure 3.9). It was even regarded as the most talked about VR art (Dixon, 2006). Similar to the embodiment element of *Dancing with the Virtual Dervish*, Osmose's contribution to the field was related to its spatial artistry, which is environment creation and its distinctive immersive capabilities. In fact, with its revolutionary inclusion of body sensors that track breath and

balance alongside the HMD, *Osmose* was unparalleled for its “fully embodied immersion”, aimed at emphasizing Cartesian mind-body dualism (Dixon, 2006).

Figure 3.9: Video Capture of *Osmose* (1995) from a fly-through performance in Montréal, Adapted from *Youtube* by Immersence, 2014

Virtual Winter

As the government-funded VR artworks of the late 1980s and the following decade indicate, virtual reality back then was the latest and most hyped technology of its time. Despite this initial enthusiasm, the number of artists creating artworks with VR as an artistic medium went into a sudden decline in the 2000s. This however was not limited to the art world. Rather, it reflected a broader phenomenon known as the "VR Winter," a period of decreased interest and investment in VR technologies, as noted by Furness (2014). So, was the sudden decline of interest in VR a result of over-hype?

According to Louis Rosenberg, winter of VR occurred due to the arrival of a newer and more exciting technology, the internet (2022). With the advent of the internet, VR unfortunately fell into disfavor. The thing that revived the VR though was not the introduction of Oculus Rift but the emergence of accessible and lightweight smartphones (Rosenberg, 2022). The smartphones have dominated the industry and developed the technologies in such a way throughout the 2010s that, the 2020s were able to see the introduction of Metaverse and Apple Vision Pro. Due to the

end of virtual winter with now easily accessible technologies, VR experienced a rebirth as an artistic medium in the late 2010s.

3.3 Virtual Revival

The mid to late 2010s marked the beginning of a virtual revival with the artists as well as filmmakers re-employing VR as an art medium. Denise Doyle saw this re-emergence and divided the engagements of the artists with the VR into two waves (2021, p 1). For instance, the artists Char Davies, Nicole Stenger and the contributors to the Banff Centre in the 1990s all belong to the first wave. The period following the VR winter is therefore the second wave of VR artists. With the arrival of the 2010s, new technological developments found their way into the popular culture. For instance, the singer Björk who showcases a combination of music, art, technology in her craft, started her technological exploration in the year 2014 with her 360-degree music video *Stonemilker*. In a social media statement accompanying the song, the singer highlighted the medium's "potential for intimacy" (Minsker, 2015, para. 4). In 2016, her VR exhibition toured globally. Her 2015 studio album *Vulnicura* containing the song *Stonemilker* was later adapted into a VR album experience in the year 2019. The singer adapting VR into her music videos displayed an increased interest in the technology in the popular culture.

Furthermore, the establishment of The Lumen Prize in the year 2012 revived the inclusion of VR in the artistic circles. For instance, the 2015 Lumen Prize was given to Michael Takeo Magruder's 2014 immersive VR installation *A New Jerusalem* (Doyle, 2021, p.9) (Figure 3.10). In the year 2017, XR Awards was organized by the networking platform AIXR. The competition includes categories for VR Experience and VR Film, each designed to recognize achievements in their respective fields. In fact, this VR focused award show even features a category dedicated to honoring VR Social Influencers.

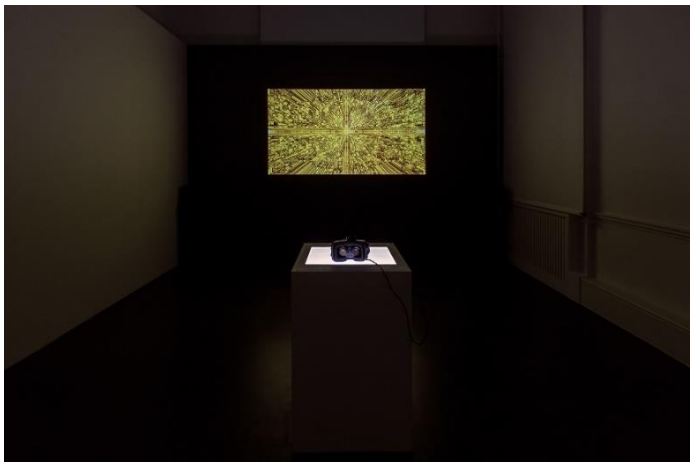

Figure 3.10: Installation of VR art *A New Jerusalem* (2014) [URL-3]

Established artists who have originally excelled in other art mediums also started to take notice of the re-emerging medium in the late 2010s. This shift was particularly evident with the establishment of Acuteart in 2017 as a project hosting an interactive platform for artists who utilize VR and AR as art mediums. One of these artists working under Acuteart is the well-known artist Marina Abramović, recognized for her art performances. Under the project, Abramović introduced her VR artwork *Rising* (2019) adressing the effects of climate change. In this virtual environment, the participants get presented with the option of either lowering the rising sea levels to save the avatar of Abramović or leaving her drown locked in a tank full of water (Figure 3.11).

Figure 3.11: Excerpt from Marina Abramović's *Rising* (2019). Adapted from *Youtube* by Acute Art, 2019

In addition to Abramović, other prominent artists have also joined Acuteart. Among them is Jeff Koons, renowned for his conceptual balloon animal sculptures known as *Inflatables*. Similar to his stainless-steel sculptures, Jeff Koons' 2018 VR piece titled *Phryne* included a virtual metallic ballerina in the style of his previous physical artworks (Figure 3.12). In fact, his virtual artwork *Phryne* bears striking resemblance to his 2017 physical sculpture *Seated Ballerina.* Other artists involved with Acute Art include David Shrigley, Olafur Eliasson and Anish Kapoor.

Figure 3.12: Jeff Koons, *Phryne*, 2018 [URL-4]

As the previous examples state, this convergence of established artists from diverse artistic backgrounds underscores the growing recognition of VR as a legitimate and impactful artistic medium and marks the second wave of VR in the 2020s.

4. SHIFTS TOWARDS VR ART IN ART HISTORY

This section of the thesis is dedicated to the shifts in art history that eventually lead to the inclusion of VR as an artistic medium. In other words, in order for VR to gain recognition as a medium of artistic expression, art history had to undergo significant shifts and witness the introduction of some creative novelties. In order to better organize and understand these shifts, this study categorizes these pivotal moments under the separate titles of VR's both unique and artistic cumulative properties. However, it is important here to note that, these categories are not rigid definitions of VR's properties. These five titles for the sake of this study are therefore merely classified associations that help better showcase the evolution in the art history.

These properties of the medium also make a reference to Greenberg's medium-specificity and Krauss' post-medium condition. By creating a blend of unique and cumulative properties, VR's status as a medium following the post-medium condition can be clearly observed. As the post-medium condition challenges the purity of the artistic mediums, this study celebrates the cumulativeness and artistic intermediality. All the separate titles therefore refer to a property of VR art while the corresponding pioneers and the new grounds they have broken are explored underneath.

However, it is important to note here that, there are a considerable number of art history movements and moments that contribute to VR's recognition as an art medium. However, only the ones that have caused drastic shifts in art production and history under the according title are included here. Therefore, some time leaps between the movements only emphasize the purpose of this study further.

4.1 Spatial Manipulation

One of the cumulative artistic properties of VR is the spatial manipulation. By its simplest definition, spatial manipulation refers to the ability of altering and controlling the space within the virtual environment. This is one of the most fundamental properties of VR as it quite literally transforms the participant into another universe.

This manipulation of the technology, when utilized by the artists, yields various ways to strengthen the artistic expression. As the history of the VR art section undercovers, the inclusion of VR into the artistic practice by the artists even in the 1990s had a deliberate purpose. Whether it was to explore postcolonial themes, as seen in Yuxweluptun's *Inherent Rights, Vision Rights* (1992), where VR served as a metaphorical "white man's mask," or to address environmentalist concerns, as exemplified in the VR works of Char Davies such as *Osmose* (1995) and *Ephémère* (1998), the use of VR was often purposeful. These intentions of the artists regarding their artistic vision can be better realized with the help of spatial manipulation. VR, quite literally frees the artists from the constraints of the actual reality. In parallel to the animation's contributions to the spatial manipulation in film, VR allows the artists to achieve previously impossible or impractical ways.

Spatial manipulation is also significant for the active engagement of the participants, which presents a level of involvement not always achievable in this physical reality bound art mediums. Immersion in this sense, carries the most importance. By ensuring full immersion, the participants fully immerse themselves in the artwork and metaphorically enter and completely witness the imagination of the artists. The controlled environment that is the virtual universe, also gives the artists a chance of overseeing the audience's emotions and reactions towards the artwork. Spatial manipulation also contributes accessibility and inclusivity to the area. Through VR art, art viwers can now transcend the limitations of their everyday realities and thoroughly enjoy their virtual ones. Artists who live thousands of miles away from each other, can now collaborate in their artworks. Although these spatial aspects of VR art seem unique at first glance, there have been various ancestors of spatial manipulation in art history.

The Introduction of Perspective

In art history studies, it is quite hard talking about the ancestor of a technique, style or medium without mentioning the Renaissance first, as many artistic advancements trace their origins back to this period. Early forms of spatial manipulation tactics can be thus seen in Renaissance artists notwithstanding the differences in the tools and technologies. However, the inclusion of technologies was not the direct connection spatial manipulation in VR art has with the Renaissance masters. This direct connection results from the need to create an illusion of reality in art, which is

ultimately how VR first came into being. This connection between the Renaissance and the striving towards the illusion of reality can be clearly seen in famous and primary sources of art history. As an illustration, prominent art historian Ernst Gombrich in his magnum opus *The Story Of Art* (1950) titled the 12th chapter dedicated to the Renaissance as *The Conquest of Reality*.

The illusion of reality in Renaissance times was first achieved by the introduction of linear perspective. This groundbreaking technique in a way revolutionized the representation of space completely. With linear perspective, the illusion of depth and thus reality was made possible and three-dimensional space was transformed into the two-dimensional canvas (MAA, 2022). Linear perspective started to be included in the canvases in the early 15th century. One of the early examples of linear perspective in canvases was created by Paolo Uccello between the years 1435 and 1460 (Figure 4.1). Uccello's artwork titled *The Battle of San Romano* was quite unique for its realistic depiction of the war. The figures in the foreground, including the placement of the broken lances on the floor, and the vanishing points all signal to the usage of linear perspective. Without the introduction of linear perspective, which is one of the earliest ancestors of reality recreation, the advent of VR and therefore VR art would not have been possible.

Figure 4.1: Paolo Uccello, *The Battle of San Romano,* 1435-1460 [URL-5]

The linear perspective seen above can be defined as an obvious ancestor to VR art, since the perspective was one of the earliest mathematical developments to be included

in art. It was devised in the year circa 1420 by the architect Filippo Brunelleschi and later documented by Leon Battista Alberti in 1435 (Blumberg, 2024). Even before it was documented though, Venetian engineer Giovanni Fontana in the year 1420 was surprisingly developing "a Pre-CAVE installation" (Codognet, 2003). Fontana, in his manuscript titled *Bellicorum Instrumentum Liber* (1420), documented his design *Castellum Umbrarum*, which means castle of shadows (Figure 4.2). According to his description, Fontana's invention was essentially a room whose walls are lighted parchments that give the illusion of moving images. According to Codognet, Fontana's room of parchment walls was later adopted in the year 1646 by Athanasius Kircher, who was also known for developing *camera obscura* (2003).

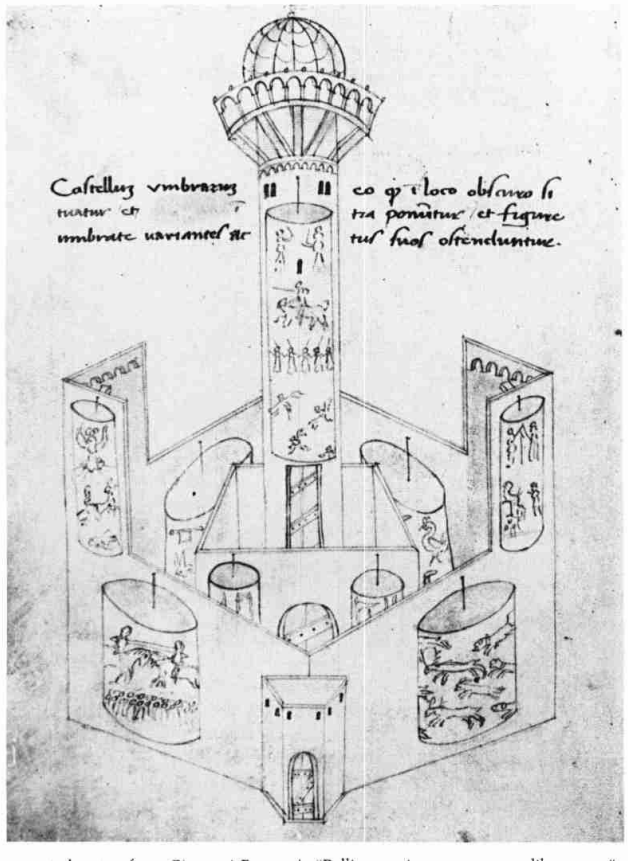

Figure 4.2: Giovanni Fontana's *Castle of Shadows*, 1420 (Codognet, 2003)

The real illusion element though, started to dominate the 15th century and the Renaissance painters with the introduction of *trompe l'oeil*. It is important to note beforehand that, the coinage of the term trompe l'oeil preceded the first usage of the technique. In other words, although the first examples of the technique were seen in Renaissance painters and architects, the term was first coined in the year 1800 by the

artist Louis-Léopold Boilly (Taws, 2019). In its essence, trompe l'oeil means optical illusions. One of the first optical illusions in art was created by Masacchio in the fresco *The Holy Trinity* (c.1426-1428) (Figure 4.3). Following Masacchio's fresco, architectural illusions started to appear inside the paintings (Willard, 1986).

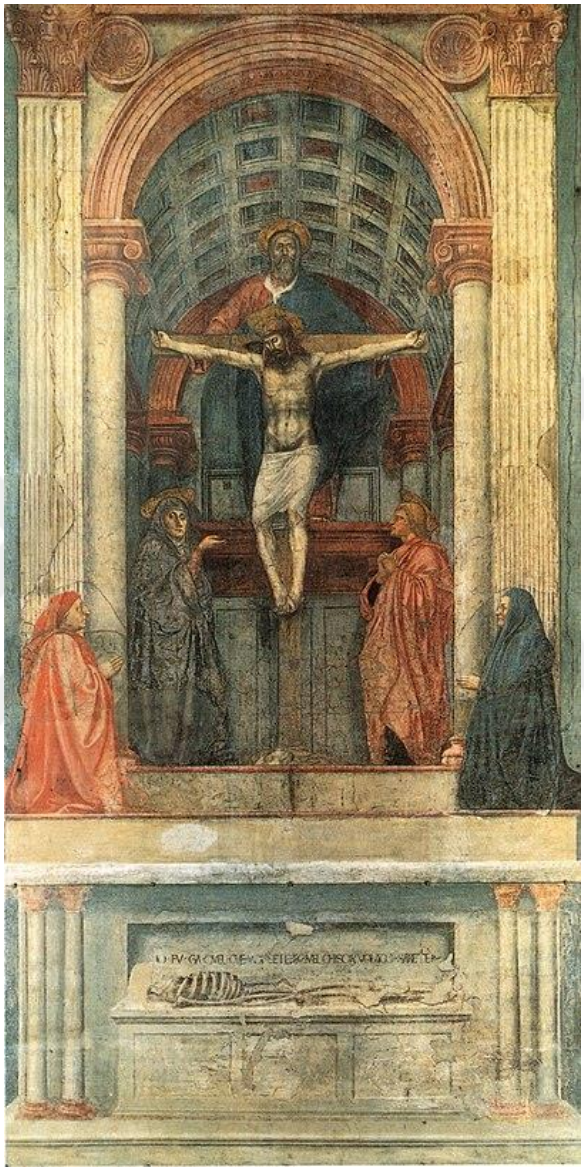

Figure 4.3: Masacchio, *The Holy Trinity* (c.1426-1428) [URL-6]

A very famous painter who also used the *trompe l'oeil* technique was Andrea Mantegna. His room full of optical illusions titled *Camera degli Sposi* in the Ducal Palace is noteworthy for its excellence in artistry, yet in some circles it is strictly criticized for taking the meaning and deepness of optical illusions away and making it superficial (Figure 4.4). This criticism stems from the fact that, the trompe l'oeil

technique was highly related to the humanistic ideas of the period and its point of origin was to intellectually blend painting and architecture (Willard, 1986).

Figure 4.4: Andrea Mantegna, *The Bridal Room*,1470 [URL-7]

Perspective Boxes

Although they are not usually connected to the history of VR as much as the other preceders, paper peep shows in art history share some resemblances with the medium. Also known as raree shows, peep shows and VR artwork share the ability of immersing the participants in immersive and often voyeuristic experiences. Invented in the 15th century, peep shows became quite prevalent in Europe, offering entertainment to the viewers. Although they are mostly associated with erotic connotations in the 21st century, even until the 19th century peep shows were a form of popular street entertainment especially favored by children. Their popularity though was at its highest among Dutch painters in the 17th century and they mostly consisted of interior designs (Lane, 2017). As a matter of fact, *perspective box* is the appropriate term for a peep show that avoids connotations of eroticism, such as in the work of Dutch painter Samuel Dirksz van Hoogstraten (Figure 4.5).

Figure 4.5: Samuel Dirksz van Hoogstraten's Perspective Box, c. 1655-60 (Garbasso, n.d.)

Another variation of the perspective boxes was *mondi nuovi*, which meant new worlds in Italian. In its essence, new worlds were exactly what these perspective boxes presented to the participants, just as virtual reality offers to the contemporary audience. They were quite popular in the 18th century Venice (Garbasso, n.d.). This presentation of another reality through the looking glass is essentially what connects perspective boxes to the VR art. In contemporary art too, VR serve as a perspective box or a new world the user of HMD can experience. In line with the interior designs of the 17th century Dutch painters, VR artist Sarah Rothberg opens the doors of her quite literal house to the VR participants (Figure 4.6). By doing that she also invites the audience to witness her emotional memories and traumas such as the death of her father.

Figure 4.6: Sarah Rothberg, *Memory/Place : My House*, 2014-2015, VR experience for Oculus Rift [URL-8]

There are are other completely *new worlds* created by VR artists. Patricia Detmering's 2019 artwork for example creates an entirely new world called APORIA comprised of inhabitants with AI (Figure 4.7). Just like the user of a *mondi nuovi*, participants of Detmering's artwork join this world for a minute through the looking glass of Oculus Rift and witness the daily human routines of the inhabitants with AI. The interesting element gained with the VR as a new medium is the fact that these inhabitants can in fact react to the participant's arrival positively or negatively, which was definitely not a feature of the peep shows.

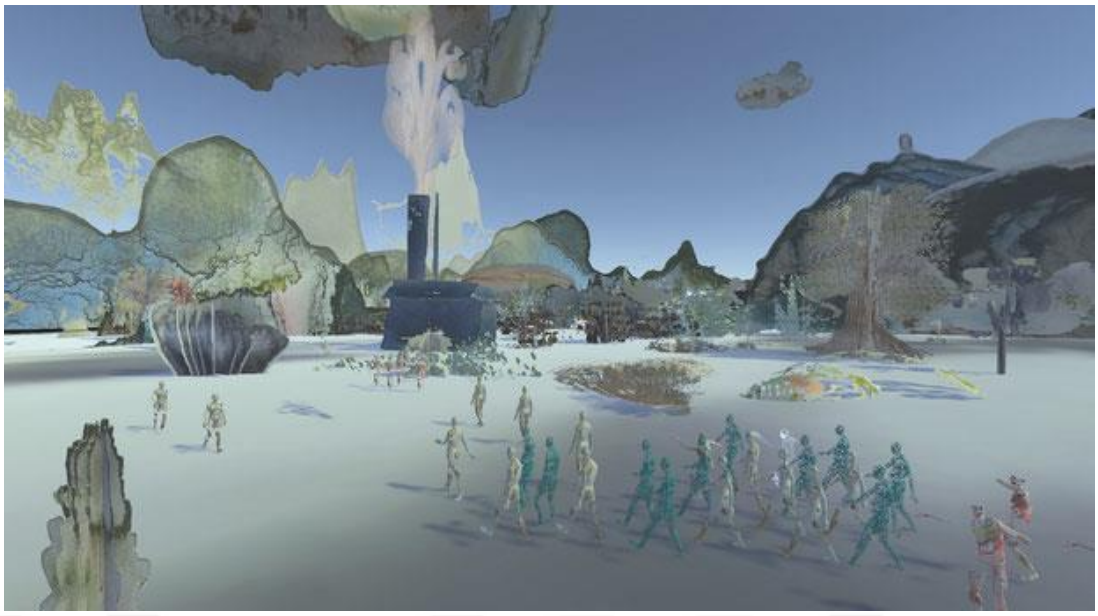

Figure 4.7: Patricia Detmering, APORIA, 2019, VR experience for Oculus Rift [URL-9]

Another similarity peep shows share with the VR is their popularity as a form of entertainment. Virtual reality's prevalence among gaming communities in the 21st century entertainment industry is quite similar to peep show's role as street entertainment. Just as perspective boxes provided a form of escapism and entertainment for their audiences, VR offers a digital form of escapism today.

Like perspective boxes, VR experiences often offer the participants the opportunity of exploring virtual worlds and scenarios that may be beyond their everyday experiences. Sometimes these virtual worlds are based on actual locations and both perspective boxes and VR artworks make use of their medium's capabilities in order to transform the viewers into a café, a city, or a country. For instance, the creators of the *Home of The Brain* (1989-91), Monika Fleischmann & Wolfgang Strauss collaborated to create *Berlin Cyber City* (1989-90) which gave the participants the chance of visiting the city in the year 1939 and in 1989, which corresponded to the fall of Berlin Wall and the date of this artwork's creation (Figure 4.8). The main idea behind the creation of this artwork was to help the participants from East and West Berlin explore the parts that are unknown to them due to the restrictions (Strauss & Fleischmann, 2008). Fleischmann and Strauss were able to transfer the audience both to a past simulation of 1939 and to their present day 1989.

Figure 4.8: Excerpt from *Berlin Cyber City* (1989-90), Adapted from *Youtube* by Monika Fleischmann & Wolfgang Strauss, 2008

A reflection of this modern example in the previous centuries could be the paper peep shows granting the audience with the chance of visiting a foreign city. Peep shows were still quite popular in the 19th century as a form of street entertainment. But they were also utilized in touristic endeavors. For instance, an anonymous peep show from Germany displayed a touch of Istanbul to the European audience (Figure 4.9).

Figure 4.9: A peep show of Istanbul by Anonymous Constantinopel, Germany, c. 1835 [URL-10]

Panorama

The Irish painter Robert Barker invented and patented the panorama in the year 1787 (Grau, 2003). Barker was also responsible for coining the term panorama which was formed from Greek words that mean all and view. In fact, Barker's announcement of his invention in a British newspaper was the first time the term was ever used (Wilcox, 1993). Barker's invention panorama was later adopted by various painters all around Europe, who adapted it with different names such as georama or cosmorama among others. While the basic mechanism behind panoramas were simple enough for a child to grasp—indeed, Barker himself taught his son, Henry Aston Barker—for the contemporary eye they are not as exciting. However, for the 18th century audience this "technological illusionism" and the realism were almost mesmerizing (Schwartz, 1998). The war panoramas of the 19th century, particularly, had a profound impact, shocking participants in a matter similar to the first film audiences who were terrified by the sight of an oncoming train. The first-time participants of the panorama even felt sick similar to first-time VR users (Ford, 2017).

This wow effect is exactly how the contemporary audiences react to virtual reality experiences. Panoramas, similar to VR artworks today were such a popular usage of entertainment and art viewing that, smaller and private panoramas started to appear in the 19th century (Grau, 2003). In fact, even Goethe had one in his chambers. In parallel with VR today, the state of panoramas as works of art were quite debated in their time. Although the illusion panoramas created in the mainstream audiences overshadowed their artistic properties, there were various well-known artists who praised panoramas. Among these artists was Jacques Louis David, who perceived the technique as a means of elevating representation in art to unprecedented levels (Grau, 2003). Of course, back then the Renaissance ideals of reflecting the reality as realistically as possible in a surface was truly favoured.

But, the real reason why panoramas can be regarded as ancestors to VR art is quite obviously due to their immersive abilities. Both panorama and VR use their corresponding technologies in order to give the illusion of another reality to their respected audiences. The term panorama, when used on its own, also refers to the building in which it is presented. However, in most cases, this usage primarily pertains to the entertainment sector to which it belonged and diminishes the actual artistic aspects. Panoramic painting, on the other hand, is a more artistic term that refers to an

artwork that uses the panoramic technology. Many artists of the period were quite fascinated by the panoramas and they took up panoramic painting. One of these artists was Thomas Cole who later founded The Hudson River School (Barringer, 2018). The influence panorama had on his art style can be clearly seen in his well-known art pieces such as his 1827 work *View of Round-Top in the Catskill Mountains* (Figure 4.10).

Figure 4.10: Thomas Cole, *View of Round-Top in the Catskill Mountains,* 1827 (Barringer, 2018)

19th Century War Panoramas

Panoramas in the 19th century, when they were quite popular among mainstream audiences, were the newest immersive technology. Due to their novelty and unusualness, they were truly shocking to the people of the time. The profound physical and emotional effects panoramas had on the people ranged from the sick feeling in their stomachs to deep fascination. When something has this powerful of an effect on people, it can easily be utilized as a propaganda tool. This combination of an immersive experience and strong emotional response was exactly how war panoramas first turned into propaganda tools. Their first connection to the battlefields though coincided with the first emergence and popularity of the invention. When Robert Barker's panorama was taken into consideration by the military strategists, the fascinating invention found itself in the trenches (Grau, 1999, p. 367). Due to their immersive abilities, panoramas were utilized for the topographic and geographic needs of the military. Once their potential as propaganda tools was discovered by Napoleon

Bonaparte of France and Lord Nelson of England though, panoramas began to be employed strategically. The wow effect panoramas had on people were utilized as a tool for glorifying the wars the governments conquered. In fact, according to Grau, almost 35 percent of the panoramas were depictions of wars (1999, p. 367). The wow effect panoramas had on people were utilized as a tool for glorifying the wars the governments conquered. This was not just specific to England and France as Germany's war panorama The Panorama of the Battle of Sedan (1883) remains as a monumental piece known for its costliness and size (Figure 4.11).

Figure 4.11: Anton von Werner, *Sedan Panorama*, 1882 [URL-29]

Monet's Panoramic Water Lilies

But perhaps, one of the most well-known usages of panoramic paintings and exhibition tactics belong to Claude Monet. Monet's main reason behind utilizing this panoramic illusion was to bring the audience and the artwork together. That was also why Monet's paintings between the years 1915-1917 were characterized by their significant size. Monet, by producing his artworks in immersive size, aimed at creating "the illusion of a single continuous canvas" (Sagner-Düchting, 1985). According to Grau, he even planned his *Water Lilies* as a panorama at first in order to give the illusion of being submerged in a lily lake (2003). In other words, if Monet were to witness the 21st century and its VR technologies, it's likely he would embrace the new medium to craft an immersive virtual reality garden (Figure 4.12).

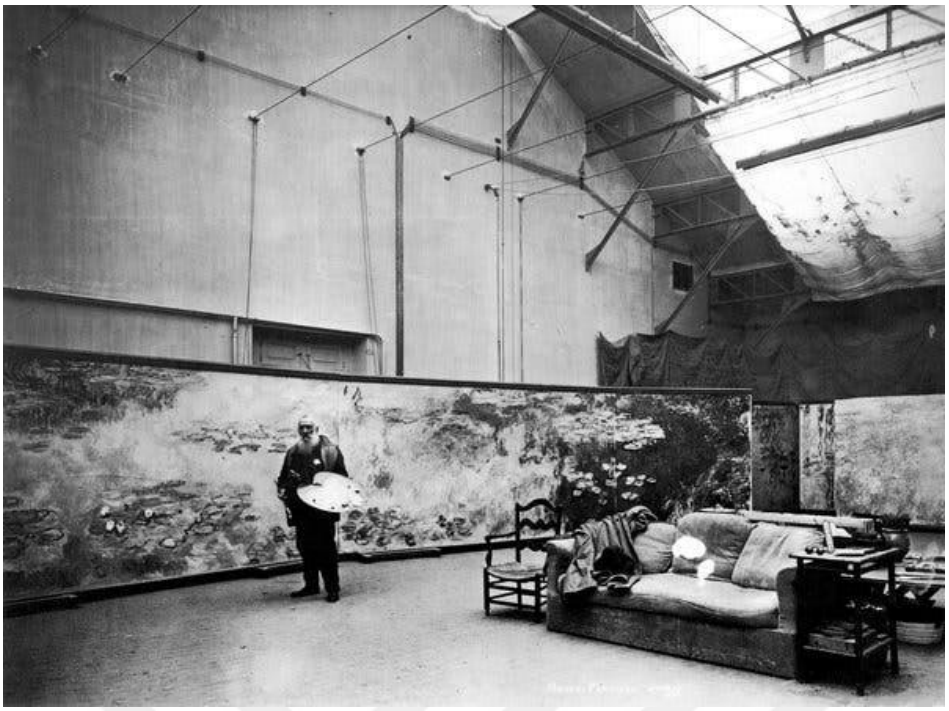

Figure 4.12: Claude Monet in his studio, 1920 (Solomon, 2016)

Indeed, the 20th century saw the renowned artists pushing the boundaries of traditional canvases, delving into spatial manipulation, and freeing the art from the constraints of conventional formats. This liberation from the canvas opened new avenues for creativity and expression. This allowed the artists to explore the relationship between space and form in innovative ways that eventually led to the usage of VR in art. One of the movements that truly freed the artists from these spatial constraints was Cubism, without which making art beyond the canvas would not have been conceivable.

Cubism

Cubism, with its revolutionary approach to depicting space and form, holds a profound connection to the spatial manipulation and therefore the emergence of VR in art. Cubism initially entered the realm of art between the years 1907 and 1914 with the works of Pablo Picasso and Georges Braque. Cubism essentially aimed at conveying the essence of an object from various angles simultaneously, in order to challenge the viewers to engage with art in a dynamic manner. In a way, Cubism can be simply defined as a modern continuation and a rejection to the linear perspective of the Renaissance period. Objects in Cubist artworks were presented from different angles in order to create meaning which was later deconstructed. This was in fact what Cubism really aimed for, the desconstruction of traditional art making techniques.

Cubists rejected the usage of linear perspective, chiaroscuro, and the representation of the nature (Tyler & Ione, 2001). This breaking from the traditional techniques of perspective and the dissection followed by the reassembly of the forms is in fact quite similar to that of VR. While Cubists created their own visual language by starting to think outside the canvas, VR deconstructs and then reconstructs environments in a virtual space. In contrast to the Renaissance painters, Cubists did not pursue giving illusion of depth in their artworks and they favored flatness (House, 2016). With the development of *Analytical Cubism* though, "a re-creation of objects, based on perceptions of mental and visual geometry" entered the realm of art (Frank et al., 2023)

Here's why this is connected to VR's role as an art medium. As it was stated earlier, the creation of the reality as a form of mimesis to the canvas was made possible by the Renaissance painters. Cubists' rejection to this literal mimesis and their focus on the perceptions of mental geometry later turned into Conceptual Art. Therefore, the geometrical reconstruction of reality in an artwork, whether it is in VR or in another form would not have been possible without Cubism. This aspect's roots also lie in the Post-Impressionism with Paul Cézanne.

21st Century Virtual Panorama

As an illustration of the evolution spatial manipulation and panoramas have experienced, artist Hito Steyerl's VR artwork *Virtual Leonardo's Submarine* (2020) can be exemplified (Figure 4.13). VR usage in Hito Steyerl's composition bears several similarities to the concept of war panoramas. Largely due to their primeval immersiveness, panoramas can be regarded as ancestors to the usage of VR in art production. Especially Steyerl's work exploring the connection between Leonardo da Vinci's submarine sketches that were discarded due to their possible destructiveness to the humanity and Leonardo S.p.A, a company supplying weapons to armed forces, is similar to the political power war panoramas have acquired as a propaganda tool in the 19th century. In parallel to war panoramas immersing the audience with the glorification of warfare; Steyerl's art piece, through the usage of VR, is designed to inform the audience about the fact that the contemporary equivalent of war is not a phenomenon completely detached from the everyday realities of people, but rather it is an immersive entity that surrounds them.

Figure 4.13: Hito Steyerl, *Virtual Leonardo's Submarine*, 2020, VR experience for Oculus Quest or HTC Vive

4.2 Dynamism & Movement

Dynamism and movement play pivotal roles in shaping the viewer's experience in VR artworks. Dynamism and movement as one of the artistic properties of VR can be thought of as a continuum to the previous section *spatial manipulation* and they are quite essential to the immersive environments in VR art. After all, the transportation of the art viewers into a virtual universe where they can actively engage with the artwork takes place by dynamic elements such as animated objects. Movement and the spatial exploration opportunies it creates are such a unique features of VR art.

Baroque Art

Dynamism as a concept first made its debut in art history following the Renaissance period. The Baroque era was the period of time heavily characterized by its dynamism. Stemming from a departure from the harmonious stability, balance and rationality of Renaissance aesthetics, Baroque art was all about the dynamism. In contrast to the Renaissance period, Baroque artists sought to capture movement through dynamic compositions and they can be regarded as the ancestors of this section. Quite similar to the optical illusions of the Renaissance, during the Baroque period trompe l'oeil was still used as a technique. But this time, the optical illusions, just as Baroque paintings and the architecture, presented an active dynamism. As an example, Giovanni Battista

Gaulli's fresco *The Triumph of the Name of Jesus* (1672–85) achieves the highest levels of illusionistic mastery while still ensuring dynamism (Figure 4.14).

Figure 4.14: Giovanni Battista Gaulli, *The Triumph of the Name of Jesus*, 1672–85 [URL-11]

The Impressionists

In the development of the artworks that use movement and dynamism, the Impressionists are worth mentioning. On this subject, the three artists who used the movement the most under their Impressionist movement were Édouard Manet and Edgar Degas. Most of the time though, these two artists used movement as a way of enhancing realism. In way of achieving that, they most of the time used dancers or animals as figures. Manet, in his 1862 painting titled *Le Ballet Espagnol* used ballet dancers in order to highlight the dynamic scene (Figure 4.15). Edgar Degas, who is more famously known for his ballet dancers also used horse races as scenes in order to showcase his movement capturing abilities (Figure 4.16).

Figure 4.15: Édouard Manet, *Le Ballet Espagnol,* 1862 [URL-12]

Figure 4.16: Edgar Degas, *At the Races,* 1877–1880 [URL-13]

Kinetic Art

The beginning of the 20th century came with such profound uncertainties that it left the individuals of that generation truly confused. When the times necessitated absolute absurdity and randomness, this could be directly observed in the public movements.

Just as the literature disposed of the syntax, so did the music get rid of the tonality. When it comes to art, this was in fact how 20th century art challenged the traditional art production techniques. This period of uncertainty and chaos was generally labeled as the avant-garde period and many artistic novelties entered the realm then. Artists, in order to cope with the complexities of a rapidly changing world in the wake of WW1, sought to break free from the limits of tradition and explore new forms of expression. This was when avant-garde movements such as Abstract Expressionism, Dada, Surrealism, and many others first came into being. While the actual artistic works they have produced under the avant-garde movements fall under the conceptualization section, dynamism and movement were also themes handled under these artistic endeavours.

In the 1910s, philosopher Albert Gleizes was already a popular figure in France and his writings on the movement in art as a concept deeply influenced Cubism. According to Glezies, movement and rhythm in art was essential for its existence (Popper, 1968). In Glezies' terms, rhythm is defined as the visually pleasing alignment of figures within a two or three-dimensional space. Gleizes's philosophical writings on movement later started to show themselves in the artworks of the famous artists under the name Kinetic Art. Kinetic art essentially emerged as the main art movement primarily focused on dynamism and movement. Kinetic art first came into being in the mid-20th century as artists started to break free from the static art forms. It is important to note that this was also an era deeply influenced by science and the emerging technological developments.

One of the most famous artists of Kinetic Art was Alexander Calder whose sculptures *Arc of Petals* (1941) are still popular to this day (Figure 4.17). *Arc Of Petals* essentially used air currents in order to naturally create movement (MAD, n.d.). Kinetic artworks, which are artworks that actually move, were quite fascinating and new to the art world at first. Kinetic Art did not even have a name for a period of time. In fact, well-known artist Marcel Duchamp in order to explain Calder's works, used the term kinetic for the first time (Popper, 1968).

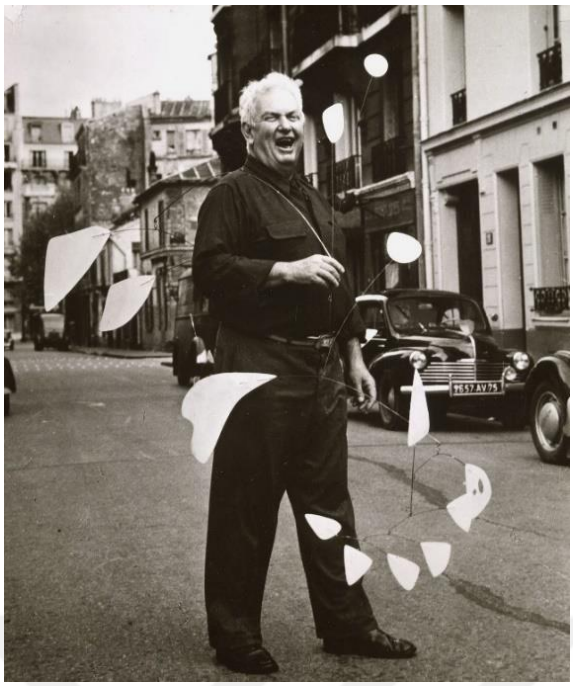

Figure 4.17: Alexander Calder with *Arc of Petals*, 1954, Photo by Agnès Varda [URL-14]

Marcel Duchamp, who is one of the first names that comes up when talking about contemporary art, produced kinetic artworks too. Although he was mostly known for his *Readymades*, which are everyday objects challenging their traditional meanings and purposes, Duchamp produced multiple kinetic artworks with the help of Man Ray. His series of kinetic art called *Rotoreliefs* spun and created a three-dimensional illusions (Figure 4.18).

Figure 4.18 Marcel Duchamp, *Rotoreliefs*, 1935 [URL-15]

Futurism

Another contributor and shift to the usage of VR as an art medium under the dynamism and movement category was Futurism. It was an art movement that emerged in Italy in the early 20th century following the manifesto of Filippo Tommaso Marinetti. Notably, Italian Futurism was deeply connected to the 20th-century politics as Marinetti himself was affiliated with the Italian Fascist Party. Consequently, Futurist ideals reflected this fascist ideology to some degree. The celebration of speed, dynamism, and the transformative effects of industrialization were central to the Futurists. Therefore, these themes were recurrent in Futurist artworks and they served as a visual reflection of the rapid changes unfolding in Italy and all around the world. In order to convey these concepts, Futurists took static objects such as sculptures and displayed movement in them. Although Futurism was quite associated with fascist ideals and this was a source of criticism, the movement's avant-garde approach in reflecting movement remains influential and can be an ancestor to the dynamic medium that is the virtual reality. One of the most famous artworks of these movement was Umberto Boccioni's *Unique Forms of Continuity in Space* dating 1913 (Figure 4.19).

Figure 4.19: Umberto Boccioni, *Unique Forms of Continuity in Space*, 1913 [URL-16]

Experimental Films

One simply cannot talk about the dynamism and movement in VR's ancestors without first alluding to the history of film. Experimental films were fundamentally an intersection between art and film. There was in fact a strong connection between the kinetic artworks of Marcel Duchamp and experimental cinema as Duchamp made his first and the only complete film *Anémic Cinema* (1926) by filming the early versions of these aforementioned *Rotoreliefs* (1935) (Figure 4.20). Marcel Duchamp's *Anémic Cinema* was once again discovered in 1940s in showings of avant-garde or abstract shorts along with Man Ray's *Emak Bakia* (1927) and *Ballet Mécanique* (1924) made by Fernand Léger and Dudley Murphy who were painters turned filmmakers (Kauffman, 2017). Marchel Duchamp's ideas regarding anti-art travelled and found their way in experimental cinema. As Duchamp made fun of art in the 20th century with his artworks, his film *Anémic Cinema* (1926) could in a way be called a mocking of conventional films. In other words, anti-art was also reflected in experimental cinema.

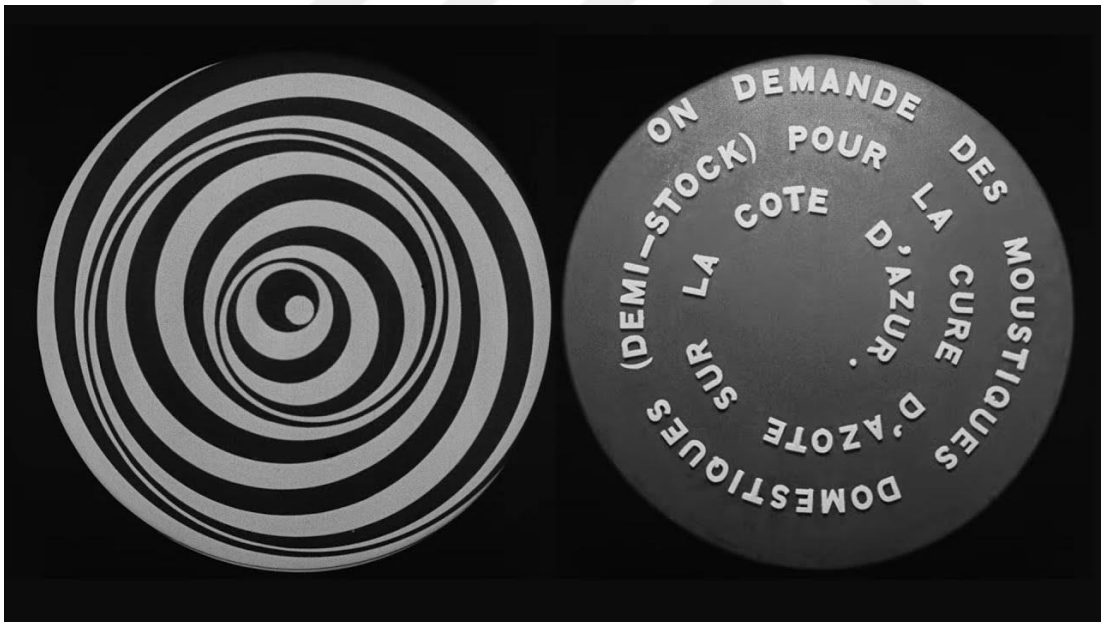

Figure 4.20: Marcel Duchamp, *Anémic Cinema*, 1926, Adapted from *Youtube* by The Museum of Modern Art, 2020

Another important figure of this period was Man Ray. Born in 1890, Man Ray was a prolific artist of the 20th century who had close connections to both Dada and Surrealism. His friendship with Marcel Duchamp contributed various significant works to the art world. According to his autobiographic work called *Self-Portrait*

originally published in 1963; after producing his first proto-Dada series, he took up photography in order to photograph his artworks (Ray, 1999). Though he earned most of his life by taking photographs professionally, it is important to note that most of his famous artworks and films did not use cameras at all.

His invention rayographs were significantly important for the development of experimental films as these were photograms produced without a camera by exposing his work to light to produce unique images. The mutual connection between Dada & Surrealist works and experimental cinema is quite evident here. As Ray produced various artworks through his new technique, he also learnt how to make films without a camera. Similar to rayographs, Ray was able to produce films without using the camera with his *cine-rayographs* (Foresta, 2003). His famous experimental film *Le Retour à la Raison* (1923) was in fact made possible with cine-rayograph. The emergence of experimental films was truly essential in the development of VR as an art medium.

Video Art

Video art is the key development when it comes to the introduction of VR art as it can be placed in multiple categories and still reflect a shift. But, the dynamism and movement aspect of video art is especially important for the scope of this study. This is because the introduction of video art not only freed the audiences who view the artworks, but also the artists themselves. According to Wahl, the first artist to use videotape was Andy Warhol in the year 1965 with his footage of Edie Sedgwick (2013). The dynamism of video art was ensured with the introduction of portable cameras in the same year. “Legend would have it that the Korean-born Paik was the first artist to purchase one of the lightweight video recorders that had just been introduced by Sony” (Wahl, 2013, p. 27). Back in the 1960s, heavy machinery used to capture photographs and videos were so big that, Sony’s TVC-2020 was considered light even though it was 34.7 kilograms (Wahl, 2013). According to Wahl, “The first really portable ½-inch devices (the most prominent being Sony’s DV-2400, also known as “Portapak”) were introduced in 1967 and immediately triggered a real video boom.” (2013, p. 30)

The emergence of portable video cameras truly inspired the artists Nam-June Paik, who transformed the art into new extents. Without his work, the introduction of VR as a medium would not have been possible. Even one of his first exhibitions in Germany

included modification of the television visuals (Wahl, 2013). These works of his later evolved into his most acclaimed work, *TV Buddha* (1974) (Figure 4.21). This application of the television as an art production tool was highly related to dynamism and movement as well, since television back then was regarded as an "animated" piece of furniture (Acconci, 1991, p. 128).

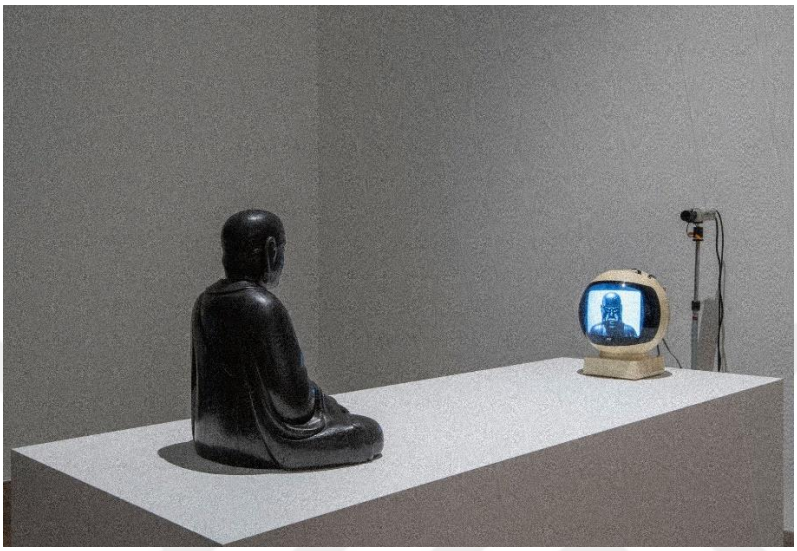

Figure 4.21: Nam-June Paik, *TV Buddha*, 1974 [URL-17]

In the 1970s, the dynamism and the movement abilities of the video was not only discovered, it also started to become a subject matter in the artworks. For instance, Valie Export, in her artwork *Raumsehen und Raumhören* (1974) aspired to juxtapose the movement flexibility of the medium with her static stance (Figure 4.22).

Figure 4.22: Valie Export, *Raumsehen und Raumhören,* 1974 [URL-18]

4.3 Conceptualization

As stated above, traditional art techniques before the 20th century were quintessentially used to copy and transfer the actual reality into the canvas. In other words, representational art's main goal was to ensure realism and the accurate depiction of people, objects, and landscapes. Therefore, technical skills that help the artists achieve this realism were celebrated and they served as the criterion for determining artistic excellence. Elements such as composition and color were quite significant and mostly recognizable scenes from the history, mythology or religion were depicted.

In VR's status as an art medium, the demise of the representational era has played the most important role. Even though virtual reality as a term has the word reality in it, and notwithstanding the fact that it is essentially an environment re-creation, ever since VR art first came into existence, the mimesis of the reality has always been used in order to deconstruct its meaning. VR art's pioneers of the early 1990s exactly indicate that. If VR was just about the realistic recreation of the reality, this study would be completely redundant as it would not be classified as art. For instance, Monika Fleischmann & Wolfgang Strauss' *Berlin Cyber City* (1989-90) without its conceptual background, would just be a virtual map of the city and nothing more. Therefore, conceptualization as a property of VR art is fundamental.

In parallel to *Berlin Cyber City* (1989-90), Tamiko Thiel and Teresa Reuter's *Virtuelle Mauer/ReConstructing the Wall* (2019) can be exemplified as a contemporary VR artwork with a similar theme and location. In Thiel and Reuter's VR artwork, The Berlin Wall is reconsctructed in order to demystify it and tell the actual history of it (Figure 4.23).

Figure 4.23: T+T (Tamiko Thiel + Teresa Reuter), *Virtuelle Mauer/ReConstructing the Wall*, 2019 [URL-19]

Like all the other properties that transfer the reader to the 20th century, conceptual art's foundations too were laid in that period. Once again, artist Marcel Duchamp had a primary role. His most famous contribution to the art world was that he changed the understanding of everyday objects through challenging their traditional meanings and purposes. He called the artworks he produced through this thinking *Readymades* and in a way gave birth to Conceptual Art with his Fountain (1917). Even before the 20th century though, an ancestor to the conceptualization emerged in France.

The Incoherents

Essentialy, the Inchorents were the precursors of the Dada movement and the Anti-Art. It was founded by the French writer Jules Lévy in 1882. Their Anti-Art tendencies were quite significant for the development of the critique of art as an institution. Even the French name of the group *Les Arts Incohérents* mocked the common French phrase *Les Arts Décoratifs*, which was also a famous art school in Paris. Even though some of their reflections and satires were quite unserious, they also questioned the state and purpose of art with questions such as what art really is and who is it for (Paul, 2021). Until the year 2021, it was believed that the artworks of the Inchorents did not survive. In 2021 though, a literal trunk containing the group's artworks was discovered. Some

of the artworks in the trunk could easily be labeled as the ancestors of Duchamp's readymades such as a green curtain (Figure 4.24).

Figure 4.24: Green curtain by Alphonse Allais with the translated title "Pimps still in the prime of life and their stomachs in the grass drink absinthe", 1897 (Paul, 2021)

Dada & Readymades

Of course, a couple of decades later, other avant-garde movements such as Dada and Surrealism followed the Inchorents in order to raise similar questions on a broader scale and with more intentions. Originating from the idea of randomness and absurdity during the wartime, Dada came with the concept of Anti-Art to criticize the society and the destructions of the war. Anti-art movement is mostly associated with Marcel Duchamp and his *Readymades* but it never had a leader nor a center. In fact, it if had, it could not have been Dada to begin with. What anti-art suggested was a rebellion against conformity, meaning and anger towards the war.

This section of the paper repeatedly applies for the readymades for a reason. Readymades once again freed the artworks from the traditional taboos. It removed the emphasis on technical skills and artistry and rather highlighted the conceptualization and ideation of art. In the context of VR as an art medium, the principles underlying Duchamp's readymades are crucial. As the brief history of VR as a technology states, VR before anything was a military simulation machine and later a gaming equipment. Therefore, with the introduction and the extension of readymades to the mainstream audiences, VR's contemporary role as an art medium eventually came into being.

Virtual Surrealism

Founded by André Breton, Surrealism, a movement originated a couple of years later than Dada, turned to the dreams and towards the inner meaning behind the unconscious. What surrealists aimed was to use the unconscious to create art. In contrast to Dada artists who still had political inclinations, Surrealists were not really interested in the war and the realities of it. In the face of a global turmoil, rather than facing it, they turned to their insides. This escapism too can be clearly seen in various VR artworks. For example, Nicole Strenger's *Angels* (1989-92) can be a great example for showcasing the surrealist background of VR. Dreamlike imagery of the Surrealists can be easily created with the help of VR. A surreal world in the works of Surrealist artists can now be visited. Mohsen Hazrati for example is a VR artist based in Iran whose artwork titled *QQQ* (2021) presents the audience a dreamlike journey into the artist's imagination (Figure 4.25). It is hard not seeing Salvador Dali's dream/nightmare like depictions in Hazrati's VR work.

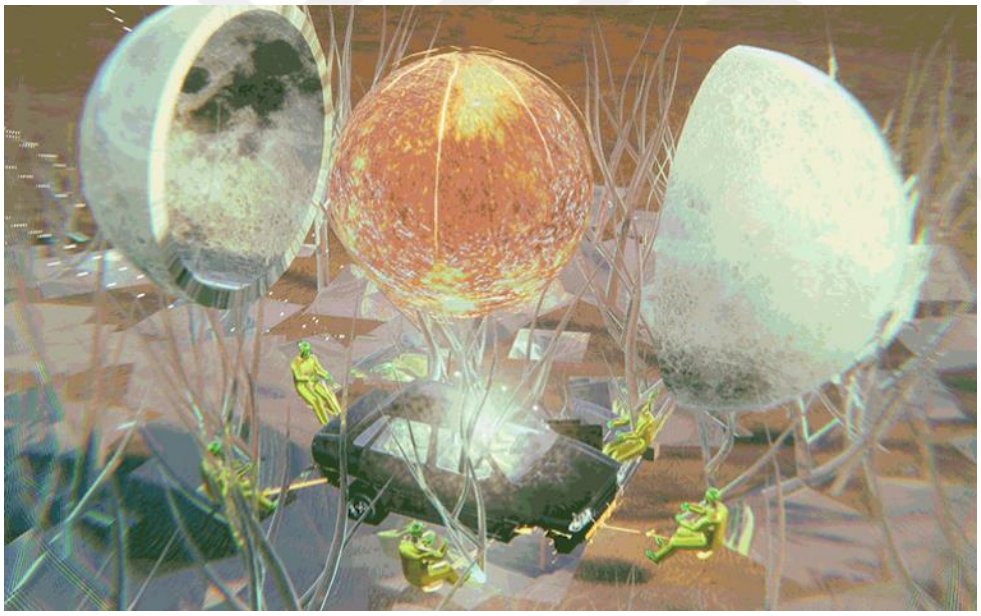

Figure 4.25: Mohsen Hazrati, *QQQ*, 2021, VR experience for Oculus Rift [URL-20]

Christian Lemmerz's *TRAUM* (2019) recreates a Freudian nightmare, which were quite popular among the Surrealists of the 20th century (Figure 4.26). Surrealists especially used psychoanalysis and the writings of Sigmund Freud in order to reveal hidden details about the unconscious mind. The snake in Freudian theory was the most frequent phallic symbol and according to Freud, the sighting of a snake in dreams chiefly symbolized sexual power (Anil et al., 2019). In fact, snakes made an

appearance in a variety of Surrealist artworks. As an illustration, Pierre Roy's *Danger on the Stairs* (1927/1928) too used snake as a primary figure (Figure 4.27).

Figure 4.26: Christian Lemmerz, *TRAUM*, 2019, VR experience for HTC Vive or Oculus Rift [URL-21]

Figure 4.27: Pierre Roy, *Danger on the Stairs*, 1927/1928 [URL-22]

Jeanne Susplugas' *I will sleep when I'm dead* (2020) is another VR experience literally inviting the participants inside a brain. In order to collect data, the artists spent the

years between 2017-2020 conducting interviews based on how thoughts look like. In the experience, the HMD user ends up inside a brain among synapses and neurons and eventually comes across materialized thoughts based on these interview answers (Figure 4.28). This dreamlike journey into the mind is quite similar to 20th century Surrealists, especially, René Magritte's 1928 artwork *The Reckless Sleeper* (Figure 4.29). Both artists chose basic drawings as symbols in order to depict thoughts of the minds.

Figure 4.28: Jeanne Susplugas, *I will sleep when I'm dead*, 2020, VR experience for Oculus Quest [URL-23]

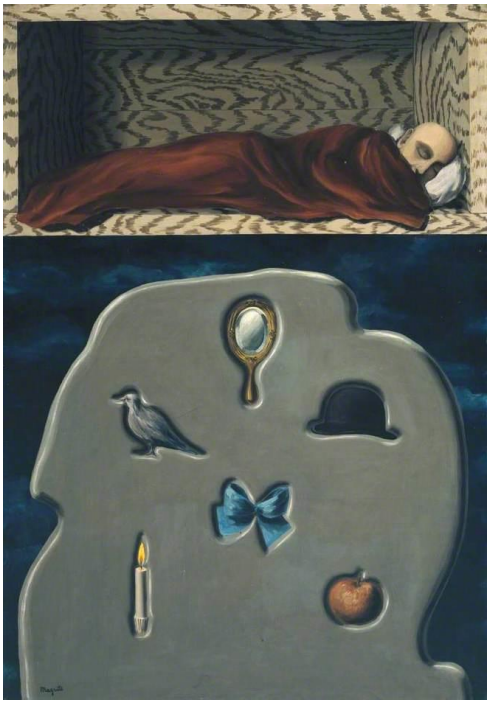

Figure 4.29: René Magritte, *The Reckless Sleeper*, 1928 [URL-24]

Fluxus and Institutional Critique

Now that the evolution of conceptualization from its first origins in The Inchorents into the Surreal artworks have been established, it is important to note that readymades and the origins of conceptual art were not the only aspects of avant-garde art worth mentioning. Another contribution Dada had to the area was the open institutional critique it presented to the world. In fact, even the existence of readymades was directly connected to this criticism towards the art world. In other words, "The avant-garde is not concerned with objects because it saw the assimilation of objects as the life blood of art as institution" (Hutchinson, 2015, p.14) A successor of this approach of Dada was the Fluxus movement.

According to Wilmer, "The common theme of their approach was to undermine the commercial value placed on art, to produce random, cheap, ephemeral, frequently comical art works and events, and to break down the barrier between art forms, and between art and life" (2017, p. 59). Indeed, most of their activities came into being as a form of criticism towards the elitism surrounding the arts. It is extremely hard pinpointing the exact characteristics of the Fluxus movement since most of the artists were against the concept of movement as it was quite restrictive. "This reality is part of the reason why many have rejected and continue to reject the idea that Fluxus was a movement at all." (Wilmer, 2017, p. 61)

Fluxus artists opposed museums acting as administrators of what constitutes art. Artist Joseph Beuys' *How to Explain Pictures to a Dead Hare* (1965) can be considered a Fluxus artwork. In this provocative work, Beuys aimed at challenging the predetermined explanations of art. As the title suggests, in parallel with the ability of explaining something to a dead animal, Beuys in his 1965 artwork criticizes the art critics and art as an institution in general. Without the institutional critique presented by movements such as Fluxus, the elitist institution that is art would have never allowed the inclusion of anything other than representational art. Therefore, the institutional critique in the history of art is truly necessary for this study's scope.

4.4 Interactivity

Early Origins of Interactivity

Interactivity is an aspect of contemporary art generally known to have entered the nomenclature with the inclusion of New Media Art into the area. Yet, even before the implementation of groundbreaking technologies, interactivity in art was existent. In 5th century BC, two Athenian painters Parrhasius and Zeuxis entered a contest in order to determine who the best painter is. The first painter Zeuxis drew such realistic grapes that even some birds flew by in hopes of eating them. The second painter Parrhasius on the other hand invited Zeuxis to his studio and to remove the curtain draping his painting. When Zeuxis tried to remove the curtain though, he realized that Parrhasius's painting was in fact the illusion of a curtain draping the artwork. Thus, in the 5th century BC, the foundations of the interactive art were laid, as the unveiling of the curtain by Zeuxis gave the artwork its meaning.

The following foundations though were unsurprisingly laid during the avant-garde period by Dada and Futurist artists. In the year 1925, Marcel Duchamp created his artwork of optical illusions *Rotary Demisphere* (Figure 4.30). For the optical illusions to start, the artwork necessitated the participant to turn on the device.

Figure 4.30: Marcel Duchamp, *Rotary Demisphere*, 1925 [URL-25]

Participatory Art

Participatory art, which also entailed interactivity, was also fundamental for the development of VR art performances. One of the most crucial performance artists of the 1950s joined *happenings*. Happenings emerged in the 1950s as a form of performance art, known for their spontaneity and interactivity. Their title was coined by Allan Kaprow in the year 1959. By performing not strictly scripted performances, Happenings aimed at including the audiences as active participants. Even though their execution seemed completely different from traditional artworks, their effort to bring the art viewer and the artist together in the artworks was shared by Monet with his immersive canvases too. This of course, later evolved into the interactivity element in the VR artworks.

George Brecht was an important figure of the Happenings. His artwork *Une Chaise avec Une Histoire* (1966) involved a single chair and a notebook (Figure 4.31). The audience participated in the artwork by becoming a part of the chair's existence. Thus, a Happening based on interactivity and collaboration was realized.

Figure 4.31: George Brecht, *Une Chaise avec Une Histoire*, 1966 [URL-26]

Another key figure among the participatory artists is Yoko Ono. Yoko Ono, in her 1964 artwork *Cut Piece,* invited the audience to cut a piece of her clothing one by one, leaving the artist to be naked (Figure 4.32). Also a pioneering feminist performance art, *Cut Piece* (1965), according to Ono “"was a form of giving, giving and taking. It was a kind of criticism against artists, who are always giving what they want to give. I wanted people to take whatever they wanted to, so it was very important to say you can cut wherever you want to” (Korchina, 2018, para. 8).

Figure 4.32: Yoko Ono, Cut Piece, 1964 [URL-27]

Change Paintings

For the development of interactivity, artist Roy Ascott was a key figure. He was also a very known figure for the development of Cybernetic Art with his essay *Behaviourist Art and the Cybernetic Vision* (2003). His *Change Paintings* (1959) even allowed the art viewers to create new images using Plexiglas slabs (Stuart, 2009) (Figure 4.33). His *Change Paintings* allowing the audience to contribute to the work is quite similar to one of VR’s pioneers, Brenda Laurel and Rachel Strickland’s *Placeholder* (1993). In *Placeholder*, the HMD user can not only leave drawings in the VR universe, but the Voicemark technology allows them to leave literal voice marks.

Figure 4.33: Roy Ascott, *Change Paintings,* 1959 [URL-28]

Situationist International

Between the years 1957 and 1972, Situationists emerged under the writings of Guy Debord. Similar to participatory art and happenings, they aimed at creating artworks as a critique of 20th century capitalism and urban city planning. They organized *dérives*, which were walks around the city for hours without an actual purpose. They in fact aimed at highlighting the city's psycho-geography. Contemporary artists too adapted these walks. For instance, Janet Cardiff is a contemporary artist known for her audio and video walks. The viewers who are using technical equipment such as iPods or smartphones to listen to the audio, simply walk as the artist intended. In fact, her and George Bures Miller's 2012 walk *Alter Bahnhof Video Walk* can be read along the lines of Monika Fleischmann and Wolfgang Strauss' *Berlin Cyber City* (1989-90) (Figure 4.34). In Cardiff & Miller's work, pre-recorded videos of the terminal are watched by the art viewer as they wander around the same locations of the video. These pre-recorded videos and the interactivity of the participants can draw obvious parallels with VR artworks.

Figure 4.34: Excerpt from Janet Cardiff & George Bures Miller's *Alter Bahnhof Video Walk* (2012), Adapted from *Youtube* by Cardiff Miller, 2012

In the evolution of VR into an artistic medium, other new artistic practices that utilize technological developments are also important. One of these artistic explorations is video game art. These days, video games are not merely a form of entertainment, they are also recognized as a medium for artistic expression. They can also reflect past art movements and the evolution of VR's status as an art medium. For instance, in the works of *Total Refusal*, a collective of artists, directors, and researchers who describe themselves as a pseudo-Marxist guerrilla media group, it is easy to see the Situationist background. Total Refusal's artworks take place inside the video games and just as Situationists, they organize walks in the video game universe. For example, their artwork Operation Jane Walk (2018) takes place inside the video game Tom Clancy's The Division, yet even though it's a first-person shooter game, the group rejects using violence and instead hosts a peaceful Situationist walk in the dystopian version of New York (Figure 4.35).

Figure 4.35: Total Refusal, *Operation Jane Walk*, 2018

More recently, walks in the cities can now be artistically expressed in the realm of virtual reality. For instance, Mariam Natroshvili & Detu Jincharadze's VR art *The City Was Asleep and It Had a Dream* (2021) takes the VR users on an urban architectural tour in Tbilisi, Georgia (Figure 4.36). In line with Situationists who organize walks to experience the psycho-geography of the city following urban planning in the 1950s, the 2021 VR experience presents the users Khrushchyovka Architecture in Tbilisi which was the name of Georgian apartment houses developed in the Soviet period in the early 1960s.

Figure 4.36: Mariam Natroshvili & Detu Jincharadze, *The City Was Asleep and It Had a Dream*, 2021, VR experience for HTC Vive [URL-29]

Participation As a Feature & Subject Matter

In contemporary VR art, participation and interactivity are not just features of the medium, but the artists use these concepts as themes and subject matters too. One of the features of the VR is its ability to re-enact. Journalist and filmmaker Nonny de la Peña, also known as the godmother of VR, used VR's this feature in order to come up with the concept of *immersive journalism*. In her documentary film *Hunger in Los Angeles* (2012), Nonny de la Peña used the immersive technology in order to re-enact the news of a man experiencing diabetic shock in the line of a Los Angeles food bank as the bystanders watch (Soler-Adillon & Sora-Domenjo, 2018). This journalistic piece was an exploration of the journalistic aspects of VR with participation and "digital empathy" as the subject matter (Figure 4.37) (Bishop, 2013).

Figure 4.37: Nonny de la Peña, *Hunger in Los Angeles*, 2012 (Bishop 2013)

Interactivity as a feature later went on to become a constant figure. This is in fact what the artist Marina Abramović utilized in her aforementioned VR artwork *Rising* (2019). By forcing the art viewers to save the avatar by making a choice, interactivity as a feature in this VR artwork is utilized.

4.5 Multisensoriality

One of the properties of VR art is its ability of appealing to multiple senses. This means that VR art does not only have visual attributes. Therefore, multisensoriality is a vital aspect of VR as it enriches the immersive quality of the art form. Virtual reality artists

frequently address different senses by often combining different art mediums in order to create multifaceted artworks in another one.

Gesamtkunstwerk

In art history, artworks that utilize multiple senses is not a novel concept. Even in the Romantic era, *Gesamtkunstwerk* which meant total artwork in English was a known term and it referred to an artwork that included elements from different arts such as architecture, music and painting (Bruns & Meyer, 2022). In fact, even before the Romantic era, trompe l'oeil artworks had a purpose of blending painting and architecture together. The term was first used in the year 1827 by K. F. E. Trahndorff. But following the year 1849, famous composer Richard Wagner in his two essays *Die Kunst und die Religion* (1849) and *Oper und Drama* (1852) appropriated the term Gesamtkunstwerk and introduced it to the world of art and academia (Wolfman, 2013).

Cabaret Voltaire

At the beginning of the 20th century though, the fact that different media could merge in order to create a new artwork re-entered the scene. Especially in Cabaret Voltaire, which is known as the birthplace of Dada, different art mediums were often utilized together under the same roof and inside the same artworks. In Cabaret Voltaire, at the same night Sophie Taeuber-Arp danced, while Hans Heusser and Marcel Sulberger played music and Emmy Hennings recited her poems (D'Amato, 2021, Richard Wagner, Wassily Kandinsky, Hugo Ball and the Dadaists section). Founder of Cabaret Voltaire, artist Hugo Ball often performed and his performances often involved Gesamtkunstwerks. He came from a theater background and his theatrical past including his poetry often were a part of his performances. Hugo Ball himself was a fan of Kandinsky and his intersections between music and art fascinated the artist. Ball is still known for his sound poems (Figure 4.38).

Figure 4.38: Hugo Ball, *Karawane*, 1916 [URL-30]

Kandinsky & Synesthesia

One of the most famous artists of the century, Wassily Wassilyevich Kandinsky was a pioneer in producing abstract artworks. According to Chadwick, "Kandinsky developed his abstract style of painting from an interest in a very old tradition, the Gesamtkunstwerk" (1986, p.11). Kandinsky himself explained his approach to a unifying art form by stating, "'Art' must march at the head of spiritual evolution, adapting its forms to this greater refinement, its prophetic role. Its inner content is unchanging, its outward form changeable." (Chadwick, 1986, p.11).

Although Kandinsky today is mostly associated with combining musical elements with his paintings, the artists' understanding of the term Gesamtkunstwerk was much deeper. Not just music, but theater and literature were the changeable forms he was talking about. In Kandinsky's understanding, an inner, spiritual reciprocity among different arts was existent (Cardullo, 2017). "This principle of reciprocity allows an artist to replace or merge one art with another, for different art forms can potentially affect the same senses and produce the same 'inner vibrations' in audience members." (Cardullo, 2017, p. 8). By using the term spiritual, Kandinsky aimed at defining the effect arts have on the audience members. This spiritual effect also resulted in him creating his *Composition 3* (1923) after attending a Schönberg concert (Figure 4.39)

Figure 4.39: Wassily Wassilyevich Kandinsky, Impression 3, 1923 [URL-31]

Yet, it is important to signify that, Kandinsky's exploration of different mediums did not limit themselves to the medium of painting. Kandinsky's *The Yellow Sound* (1912) for example was a significant experimental theater piece (Figure 4.40). *The Yellow Sound* (1912) was a direct reflection of the Wagner influence in his works (Cardullo, 2017). Since in Kandinsky's time, Wagnerian understanding of the Gesamtkunstwerk was outdated, "Kandinsky offered his own model of the Gesamtkunstwerk. He named his new model a 'stage composition,' a form centered on the principle of internal spiritual connections among sound, movement, and color" (Cardullo, 2017, p. 6).

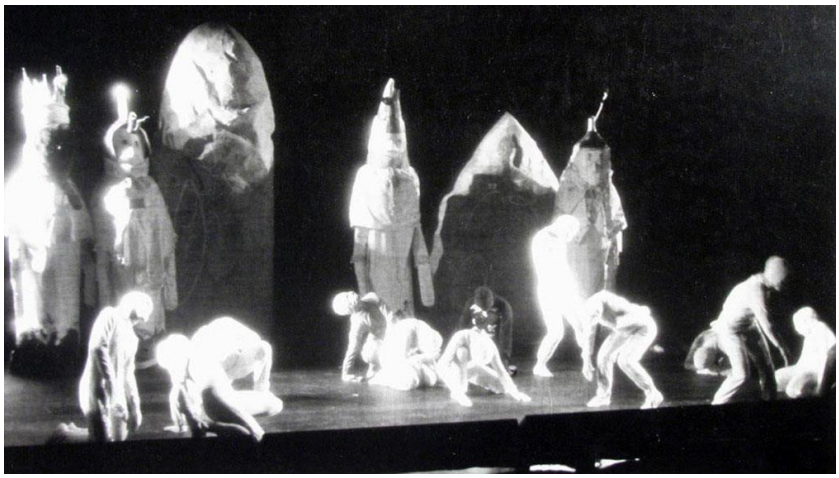

Figure 4.40: The world premiere of Kandinsky's *The Yellow Sound* (1912), 1972 [URL-32]

Kandinsky was also a member of the Bauhaus, which was an important establishment in the way of teaching arts from a unifying point of view. Architect Walter Gropius made sure the institution taught all forms of art and design. He even coined the term *total design*, which was a unifying approach to modern design and it too stemmed from Gesamtkunstwerk.

Heilig's Sensorama

When it comes to the actual multisensoriality aspect though, Morton Heilig's *Sensorama* (1962) was a groundbreaking invention that bridged the gap between traditional art forms and the emerging medium of virtual reality. Morton Heilig was quite interested in the evolution of art and film. As mentioned in the previous chapters, he even wrote an essay on *The Cinema of the Future* (1955). Essentially Sensorama provided the audiences a simulation of a motorcycling ride in the city of New York (Figure 4.41). This machine utilized fans to simulate wind and incorporated the city's scents in order to provide a rich multisensoriality experience (Regrebsubla, 2015). Heilig's Sensorama pioneered the multisensory approach that is foundational to VR art.

Figure 4.41: Morton Heilig's *Sensorama*, 1962 [URL-33]

Sensorama was not the first immersive invention Heilig contributed to the science and film circles. The first HMD named the *Telesphere Mask* was also patented by him (Berkman, 2018, Immersive Movies section). His projects combining all the senses of the individuals finally evolved into his *Experience Theater* in the year 1969. Similar to the Sensorama in the basic sense, *Experience Theater* (1969) extended the space of *Sensorama* into a whole theater. Heilig's invention of *Experience Theater* (1969) can be easily described as a pioneer of experience design.

Video Art, Again

Video art was such an influential phenomenon that, every aspect of it can be described under different categories of this study. Although video art has been discussed in terms of dynamism and movement, this study would be incomplete without addressing the audiovisual attributes of video art. In fact, the audiovisuality of the medium is fundamental for its existence (Spielmann, 2008, p. 1). These audiovisual practices in art were also closely linked to Fluxus performances. One of the first exhibitions of Nam-June Paik, influenced by his mentor John Cage, who is notable for his music and artworks utilizing sound, was the *Exposition of Music – Electronic Television* (1963) (Figure 4.42). In this exhibition," four 'prepared' pianos, mechanical sound objects, several record and tape installations, twelve modified TV sets, and the head of a freshly slaughtered ox above the entrance awaited visitors." (Media Art Net, para. 1).

Figure 4.42: Nam June Paik, *Exposition of Music – Electronic Television*, 1963 [URL-34]

This exhibition of Paik later evolved into his *Piano Piece* in the year 1993 (Figure 4.43). Paik created this work following the demise of John Cage, as an homage (Lee, 2012).

Figure 4.43: Nam June Paik, *Piano Piece*, 1993 [URL-35]

Another pioneering example of this connection between sound and art is the performances of the artist Steina's *Violin Power* (1969-1978) (Figure 4.44).

> "In the performances of Violin Power between 1970 and1978, Steina analyzes the modes of expression of video from the perspective of an audio artist trained in music. Thereby the intermedial capacities of video apparently help to characterize the new medium as audiovisual. In this circuit structure we hear what we see and we see what we hear. Steina is playing a violin and the video at the same time, and both media intersect in their performative, open-ended capacities." (Spielmann, 2010, p. 13)

Figure 4.44: Steina, *Violin Power*, 1970, Analog Video [URL-36]

5. CONCLUSION

In conclusion, this study was an introduction to describing the vast connection between VR as an art medium and art history. One of the most significant challenges of this study was the hardship of offering a framework for categorizing VR's properties and the art historical shifts accordingly. This limitation resulted from the fact that there were a considerable number of intersections between different categories. In other words, although this study aimed at categorizing the shifts towards VR art in art history systematically, since some art periods, movements and introductions were influential in various areas, they had to be included under more than one category. In order to deal with these intersections, this study implemented some solutions. First, some seminal introductions in art history were included under multiple shifts. For instance, video art was included under both the *dynamism and movement* category and the *multisensoriality* category due to its significant impact on both areas. The same solution applied to the Dada movement. Experimental films of Dada were included under *dynamism & movement* category, whereas Readymades of Dada artists such as Marcel Duchamp caused a shift under the *conceptualization* category.

The second solution was to adhere to only one category, which was implemented during the process of situating Cubism. Cubism is in fact a seminal art movement that could be easily recurrent in multiple categories. Indeed, although this study positioned the shifts Cubism caused under the *spatial manipulation* category, Cubism also paved the way in the *conceptualization* heading. However, the main idea behind this framework categorizing the shifts towards VR art in art history was to describe these shifts concisely. Consequently, some shifts had to be opted out unfortunately while the others recurred under more than one category. This study approached this problem of recurrence as an emphasis showing the importance of video art and avant-garde movements in the emergence of VR as an art medium.

Another potential obstacle in the way of categorizing these shifts was the issue of chronology. Even though the order of these shifts was deliberately prepared – for instance the *spatial manipulation* category was the first as it included shifts from the

Renaissance period, the intersections between the categories once again resulted in some anachronies, repetitions and leaps of movements. For the reader, these leaps could potentially disrupt the linear flow of reading. As an illustration, as the *interactivity* section ends with Janet Cardiff & George Bures Miller's *Alter Bahnhof Video Walk* (2012) and contemporary VR examples such as immersive journalism, the next section *multisensoriality* starting with Gesamtkunstwerk of the 19th century was although inevitable, possibly disruptive too.

In the order of some shifts, some back and forth narratives occurred due to the categorization. Yet, once again it would not be a stretch to say that these repetitions and leaps resulted from the nature of art's evolution. In other words, even though this study by describing VR as an art medium aimed at blending new media art and contemporary art in a more linear and cohesive way, the end results of this study showed that art movements and thus art history have never been linear. Let alone the hardships of pinpointing the exact origin dates of these movements with goals of creating a chronological order, there were too many art movements happening at the same time and sometimes under the same titles. For instance, Fluxus was mentioned in the *conceptualization* section for its institutional critique. A very similar movement *happening* at the same time was the Happenings, which is situated under the *interactivity* category. These simultaneous movements shared artworks and artists.

Even though there were some limitations in the way of categorizing these shifts, this study was successful in presenting that there was indeed a deep art historical background of VR artworks. One of the most significant contributions of this study to the area could be the links between various art movements in art history and their pioneering and contemporary examples. This study not only named various contemporary artworks, but also described their reasons for choosing VR as a medium for artistic expression. By doing so, VR's status as a contemporary art medium was enhanced and highlighted. This was further achieved by including the renowned artists who usually utilize more recognized art mediums and their usage of VR. To put it another way, the gap in contemporary art historiography was filled by describing contemporary artists of this decade.

For researchers who wish to further delve into this connection between VR art and art history, it is important to note that the categorization aspect of this study might lead to a problematic understanding. This results from the fact that, in art history

categorization is never easy. This showcased itself in this study too. Although most of the art movements are directly related to each other, the categorization of them under these properties of VR highlighted some nuances between the movements. Therefore, for the researches of art history who wish to embark on this area of research, an understanding of these five properties as mere associations is extremely necessary.

There are various properties of VR art that had to be limited to a general title based on associations in art history. There are also more properties of VR that are existent to explore. Namely, since the spacial properties of VR art was described in this study, the temporality of VR artworks and their art historical backgrounds are waiting to be explored. This temporal exploration too is significant for the area since most of the origins of VR and thus new media arts are time-based artworks.

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