Digital Avantgarde

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# Preface

New media, digital, computer, or unstable media art is at the core of my artistic practice. Rephrasing the V2 Unstable Media Manifesto (1987), my artistic practice uses electronic waves, frequencies, engines, sound, light, video, sensors, and computers. All those media have an inherent instability, and embracing that instability makes them challenging yet interesting to me[[1]](#footnote-1).

In an environment like DogTime at the Rietveld Academy, unstable media is present on paper rather than in practice. In my year and years ahead, no more than a handful of persons embrace unstable media in their artistic practice. Most of my classmates focus on fine arts[[2]](#footnote-2), like painting, sculpture, installations, video[[3]](#footnote-3), and mixed media, all collected in the DogTime terminology of “Expanded Painting.” Some embrace performative elements, and digital media usually does not go beyond video. Even in these cases, the artwork is generally “static”; there is no interaction, and the viewer is dissociated from the work most of the time.

This has led me to search for how to reconcile the view of unstable media and computer art with the more traditional forms of “Expanded Painting” that I see at the Rietveld. This is the aim of this thesis. For this I will use the Avantgarde artistic movements as theoretical framework. It is my hypothesis that unstable media art is the natural evolution of the avantgarde into the digital age of information.

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# Introduction

Nowadays, we live in a world where most of our interactions are mediated by technology. We could argue about digitalisation's positive and negative aspects or propose alternatives for those developments. Still, unless there is a radical change at a global scale, digital is here to stay.

In the landscape of contemporary art, the emergence of digital technologies has not only transformed artistic practices but also challenged the conventional structures of art institutions. This thesis delves into the intricate relationship between contemporary digital art and established art practices and institutions. We unravel the dissonance through the lens of lessons learned from avantgarde movements. As we navigate this exploration, it becomes apparent that the principles once championed by avantgarde pioneers’ clashes are alive on establishing digital art and art practices reacting against the established institutional frameworks that aim to house and legitimise artistic endeavours.

To comprehend the contemporary discord, we first turn to the lessons imparted by avantgarde movements. These radical artistic endeavours, born out of a desire to break from tradition, questioned art's autonomy, art institutions, and the role of art in the praxis of life. Our journey begins with exploring how these movements sowed the seeds of rebellion against established norms, challenging the existing order and laying the foundation for a discourse that continues to resonate today.

The first chapter follows the historical context of avantgarde movements. Here, we set the stage for an in-depth exploration of the clash between contemporary digital art and established art institutions, drawing inspiration from the rebellious spirit of avantgarde movements. By revisiting the principles of autonomy, institutionalisation, and the societal role of art, we aim to understand the profound shifts accompanying the digital age. The subsequent chapters will delve into the challenges of unstable media, the digitalisation of life, and the emergence of a new "digital creative practice."

Central to our inquiry is the concept of the autonomy of art, a principle cherished by avantgarde visionaries juxtaposed against the institutionalisation of art. The first sections illuminate the tension between the inherent freedom of artistic expression and the institutional structures that seek to categorise, validate, and often stifle innovation that gave fruitful soil to the historical avantgarde movements to develop. The clash between the avantgarde spirit and institutional expectations sets the stage for examining digital art's place in the contemporary art world.

To comprehend the disjunction, we delve into the multifaceted relationship between art, the status quo of society and everyday life. As we unravel these threads, it will become evident that avantgarde art challenges not only institutional norms but also societal expectations, inviting us to rethink the role of art in our daily lives. Those challenges will come back when we look at digital art in the contemporary world.

As we venture further into contemporary art, the second chapter on "Unstable Media" beckons our attention to the transformative impact of digital technologies on artistic expression. The term "unstable media" encapsulates the dynamic and ever-evolving nature of artistic practices influenced by digital tools and platforms. This chapter is the first bridge between avantgarde ideals and the unprecedented possibilities of the digital age.

We follow with the core of this thesis, which is the chapter on computer art. This chapter, laden with illustrations and case studies, seeks to unravel the intricacies of unstable media and computer art compared to traditional forms. By examining practical differences, conceptual paradigm shifts, and illustrative examples, we embark on a journey that lays the groundwork for understanding the nuanced relationship between contemporary digital art practices, the institutional frameworks that seek to encapsulate them, and paradigm shifts accompanying the digitalisation of artistic creation.

Embedded within the exploration of unstable media is an inquiry into the digitalisation of life itself. The increasing interdependence between art and technology prompts a revaluation of our understanding of artistic objects and their place in an environment saturated with digital stimuli. We get inspiration from the film "Ghosts in the Shell" as we navigate the intricacies of identity, existence, and the transformative power of the digital realm. This will delve into the profound implications of the cyborg metaphor. Donna Haraway's proclamation that "we are all cyborgs" becomes a guiding principle, inviting reflection on the symbiotic relationship between humans and technology. This interconnectedness extends beyond mere tools and engenders a new perspective on artistic creation, where the boundaries between artist and medium blur into a collaborative dance.

We scrutinise the practical differences between computer art and traditional forms to contextualise the paradigm shifts brought about by unstable media. Three distinct shifts from conventional art practice emerge, each challenging established norms and inviting a redefinition of artistic processes and outcomes.

We illustrate this with the work of Vera Molnar, an artist who navigated the transition from the imaginary realm to the tangible, marrying the ethereal possibilities of digital creation with the materiality of the real machine. This illustrative case study encapsulates the transformative journey from concept to manifestation within computer-generated art.

As we traverse the chapter, the distinctions between digital art objects and their traditional counterparts become increasingly pronounced. We scrutinise both the practical and conceptual disparities, shedding light on how digital technologies have reshaped the materials and methods of artistic creation and the very essence of what constitutes an artistic object.

At the heart of this exploration lies a redefinition of the artist and their role in the creative process. The emergence of the new "digital artist" challenges conventional notions of authorship, craftsmanship, and the tangible marks of the creator on a “canvas”. Digital tools usher in a paradigm where the artist is mediated by technology but becomes a mediator, orchestrating algorithms and manipulating code to breathe life into virtual canvases.

With the artist and their practice evolving, the very nature of the artistic object undergoes a profound shift. No longer confined to a static canvas or a sculpted form, the "digital art object" is dynamic, interactive, and mutable. We dissect the conceptual underpinnings of this shift, exploring how digital art objects challenge the viewer's traditional expectations of permanence, singularity, and the sanctity of the original.

Embedded within this exploration is a reflection on the relationship between digital art practices and the avantgarde movements of the past. While avantgarde artists sought to break free from traditional constraints, contemporary digital artists face similar challenges while navigating a frontier where the boundaries between virtual worlds and the real world blur, opening up new avenues for experimentation, innovation, and a redefinition of artistic autonomy.

We illustrate this with Rafael Rozendaal's exploration of the internet as a canvas. His work serves as a poignant illustration of the transformative shifts mentioned in the chapter. His digital artworks, accessible to anyone with an internet connection, challenge the traditional notions of art consumption, distribution, and ownership. The internet becomes both the medium and the exhibition space, democratising access to art in ways inconceivable within the confines of traditional art institutions.

As we navigate the evolving landscape of digital art creation, originality becomes a focal point. In digital art, replicability is not a flaw but a feature.

We have one final chapter to probe into the challenges posed by the digital age to the traditional concept of originality, exploring the dichotomy between the myth of originality in traditional art and the replicability inherent in the digital realm.

Traditional art often romanticises the notion of the singular, irreplicable masterpiece, elevating originality to mythical proportions. However, in the digital age, where copies are exact and infinitely reproducible, the very foundation of this myth is questioned.

We point out how the commercial dimensions of digital art are bringing digital art back into the traditional frameworks it aimed to disrupt. The rise of NFTs (Non-Fungible Tokens) will serve as an example.

We close with some personal final remarks on my practice and my take on the digital avantgarde.

# Avantgarde movements

In this chapter, I will provide historical context to the avantgarde view on aesthetics, art objects and art practice in general. This chapter aims to clarify the theoretical concepts used in this thesis.

The Wikipedia entry on the Avantgarde defines it “as a genre of art, an experimental work of art, and the experimental artist who creates the work of art, which usually is aesthetically innovative, whilst initially being ideologically unacceptable to the artistic establishment of the time.” (Wikipedia 2014-2023)

We should keep this definition in the back of our minds. However, this is not our primary definition, because it has at least two challenges for our argumentation. In the first place, the definition needs to be narrower. If we follow that, any artistic expression outside the mainstream falls under the avantgarde umbrella. This would imply that any art object using innovative media would fall under the Avantgarde; as we will later see, this is not the case. In the second place, this definition must illustrate the ideals and motivations of the historical avantgarde movements.

I will follow “Theory of the Avantgarde” by Peter Burger (Burger 1984) and “Historische Avantgarde” by Ferdinand Drijkoningen et al. (Drijkoningen et al. 1991) to underpin the understanding of the theory of Avantgarde used in this thesis.

The first thing to understand about the Avantgarde is that it does not refer to one artistic movement. The Avantgarde encompasses a group of artistic movements considered innovative for their time[[4]](#footnote-4).

Paraphrasing the introduction of (Drijkoningen, et al. 1991), we can say that chronologically speaking, the first wave of Avantgarde movements is from before World War II. This wave came to a halt in the mid-1930s. This wave, called the *“Historical Avantgarde,"* encompasses artistic movements like Dada, Surrealism, Futurism, and Constructivism.

New Avantgarde impulses then emerged at the end of the 1940s and the beginning of the 1950s, giving rise to a second wave called the *"neo-Avantgarde"*. Some of the movements in this new wave include Pop Art, Conceptual Art, Kinetic Art, Feminist Art, Minimalism and Fluxus.

It's important to note that avantgarde principles vary significantly between movements and periods. Some movements, such as Dada and Surrealism, may embrace absurdity and irrationality, while others, like constructivism, prioritise structure and interdisciplinarity. Nevertheless, overarching themes of avantgarde art are:

* Reaction to the autonomy of art (Burger 1984),
* rejection to art institutionalisation (Drijkoningen, et al. 1991),
* challenging the status quo in art and society (Burger 1984) and (Drijkoningen, et al. 1991),
* the role of art in everyday life (Burger 1984),
* and a commitment to innovation and experimentation (Wikipedia 2014-2023).

There are more principles related to Avantgarde art. For example, radicalism, interdisciplinarity, social and political engagement, rejection of tradition, and democratisation of art, but we will not discuss those here in detail.

## The core avantgarde subjects

I will now proceed to describe and illustrate the core avantgarde subjects that will form the common thread of this thesis. Any art movement that claims to be Avantgarde ought to at least address the subjects presented here.

### The autonomy of art

The concept of the autonomy of art refers to the idea that art should be self-contained, self-referential, and independent of external influences, particularly those of politics and society. It implies that art should be valued for its own sake, without the need for it to serve a specific function or purpose in society.

According to (Burger 1984), Chapters 2 and 3, the idea of the autonomy of art, particularly the notion of *"art for art's sake"*, gained prominence during the rise of bourgeois society in the 18th and 19th centuries. It reflected a desire to separate art from utilitarian and practical functions. This concept aligns with the values of the emerging bourgeois or middle-class society, which valued individualism, self-expression, and the pursuit of aesthetic pleasure. Art is then seen as a realm where individuals can freely explore their creativity and emotions. In particular, Peter Burger points out that the rise of the individual independent artist coincides with the appearance of the private art collector. As a follow-up, the autonomy of art also played a role in the development of cultural capital. Art, especially in the form of fine arts and high culture, became a marker of social status and education among the bourgeois class.

Peter Burger points out that Avantgarde artists rejected the notion of art's autonomy, arguing that it had become an isolated and elitist pursuit within bourgeois society. They sought to break down the barriers between art and everyday life. Movements, such as Dada and Surrealism, believed art should not exist in isolation but should actively address pressing concerns. Therefore, they engaged with political and social issues and challenged the bourgeois order.

[Illustration]

### Art institutionalisation

The developments on the autonomy of art also promoted the “autonomous art institution”.

Ferdinand Drijkoningen quotes Bourdieu as follows: *“…the process of art's autonomization correlates with the emergence of a distinct societal category of art producers. These producers are increasingly inclined to recognise only those rules that have been handed down by their predecessors, which can either serve as a starting point or be the rules they choose to break. Over time, they become more capable of shedding any societal servitude, whether it be related to moral censorship and aesthetic programs imposed by a proselytising Church, or academic control and demands from a political authority that seeks art as a propaganda instrument. In other words, just as the emergence of law as law, i.e., as an "autonomous domain," is associated with the advancing division of labour leading to a community of professional jurists, the process that leads to the constitution of art itself is accompanied by a change in the relationships that artists maintain with non-artists and, as a result, with other artists. This change leads to the formation of a relatively independent intellectual and artistic field. It is also related to the development of a new definition of artists and their art”* (Drijkoningen, et al. 1991, 16)[[5]](#footnote-5).

In other words, the autonomy of art is not only about the art object itself but also implies that the institutions around it became autonomous themselves. More precisely, following (Drijkoningen, et al. 1991, 15), an institution is defined as *“an organised system of goal-directed activities”*. Therefore, by an “autonomous art institution”, we mean “an organised system of goal-directed activities for art”, where the institution itself defines art.

For example, a guild of painters guided by this belief no longer paints for the functional purpose of painting, e.g., decoration for the Church, but for its internal rules and objectives.

A more modern illustration of this would be the situation with Art galleries, which only address art as defined by them. Another example is the Rietveld Academy itself;

*“The Rietveld Academie is a small-scale, independent and internationally oriented university of applied sciences for Fine Arts and Design in Amsterdam (NL).”* (Rietveld 2023)

Ferdinand Drijkoningen (Drijkoningen, et al. 1991, 23-26) claims that rejecting these *“autonomous art institutions”* is a core element of all avantgarde movements.

In the case of the historical avantgarde movements, he describes the following four patterns of reaction to art institutions:

1. **Total Rejection:** A first and most radical view is rejecting any form of institutionalisation. *Dadaists* rejected the traditional art world and organised anti-art exhibitions and performances in defiance of established art institutions. Their work was often characterised by absurdity and anti-establishment sentiment. For example, Marcel Duchamp's *“Fountain”* (1917) is a urinal signed with the name “R Mutt”. Fountain is one of the most iconic art pieces of the 20th century, representing a significant shift in the function of art in society. It is one of the earliest examples of “*readymade”* sculptures. We will come back to this example in the next section.
2. **Alternative uses:** A second view of the place of art in the social order is one in which a different role is assigned to the institution of art. It has already been pointed out that institutions form a hierarchical structure: certain institutions can encompass the whole of institutions, often not without conflicts. *The Surrealists* aimed to challenge the conventional understanding of reality and art by exploring the unconscious mind. They sought to disrupt traditional norms through dreamlike and provocative works. For example, Rene Magritte's *“La Trahison des Images”* depicts a pipe with the text underneath “this is not a pipe”. Here, we can see a challenge to the establishment of paintings that are only images. The work's use of text and self-reference opens alternative perspectives to appreciate a painting.
3. **New order:** A third view engages in a radical battle with the existing institution of art and aims for a "new order," a complete upheaval in the social order. These movements speak of the "integration of art and social life" and the "aestheticisation of life". *The Italian Futurists* aimed to break with traditional artistic norms by introducing radical changes that would embrace the industrial age, technology, speed, and the dynamism of modern life.
4. **Change of perspective:** A fourth strategy focuses on the artwork and the associated beliefs: this is where the rupture lies with everything previously done and thought in this field. These alternative artworks and beliefs will bring about a revolution in the institution of art, which will automatically have repercussions elsewhere in the social order. *The Constructivist* movement aimed to create a new visual language that was in sync with the rapidly changing social and technological landscape of the early 20th century. The *“Staatliches Bauhaus”* (1919-1933) combined craft, fine arts and living style in its educational program. The influence of the Bauhaus is still seen today in several areas of design, art and architecture (DW Documentary 2019).

In the neo-avantgarde movements, we also see other types of reactions to institutions, for example:

1. **Creating Alternative Spaces:** Some avantgarde movements created their own alternative art spaces, such as artist-run galleries, performance venues, or publications. These spaces allowed them to showcase their work without the restrictions of traditional institutions and often fostered a sense of community and collaboration among artists. *The Situationist International* sought to create alternative situations and experiences through art and activism. They organised events, such as "psychogeographic" explorations of cities, outside the confines of traditional art institutions.
2. **Anti-Commercial Stance:** Many avantgarde movements resisted the commercialisation of art and were critical of the art market. They viewed art institutions as complicit in this commodification and believed that it compromised the integrity of artistic expression. *Street Art and Graffiti* artists often work outside the commercial art world, using public spaces as their canvas. They resist art market pressures by creating art that is accessible to a broader audience. Often, street artists want to remain anonymous.
3. **Desire for Inclusivity:** Some avantgarde movements, particularly those with political or social agendas, aimed to make art more inclusive and relevant to the general public. They often sought to challenge the elitist nature of art institutions and advocated for greater accessibility and diversity in the arts. The *Black Arts Movement* was a cultural and political movement aimed to make art more inclusive and relevant to the African American community. It fought to challenge the elitism of traditional institutions and promoted art as a means of cultural expression and social change.
4. **Temporary and Site-Specific Works:** Some avantgarde artists created temporary or site-specific artworks that defied traditional museum or gallery settings. These works were often meant to exist outside the institutional framework, challenging the idea of art as a permanent, collectable object. *Land Art (Earth Art) artists* make works that do not fit an art institution's traditional premises. For example, Marinus Boezem's *“De Groene Kathedral” (1996)* consists of trees planted in such a way that they replicate the cathedral of Reims. Such large-scale, site-specific works are not meant to be collected or displayed in traditional art institutions but are integrated with the natural environment.

<picture>

1. **Collaboration and Interdisciplinarity:** Avantgarde movements have frequently embraced collaboration and interdisciplinarity, working with artists from various fields and challenging the separation of art forms within institutional structures. As mentioned before, The *Bauhaus school* promoted collaboration among artists, architects, and designers, breaking down the divisions between art disciplines. This interdisciplinary approach challenged traditional educational and institutional structures.
2. **Reappropriation and Appropriation:** Some avantgarde artists have reappropriated or appropriated elements of art institutions' collections or spaces as a form of protest or to question the role of institutions in shaping artistic value. Elaine Sturtevant pioneered the *Appropriation Art* movement by appropriating/copying her contemporary male artists. For example, with her work *“Haute Tension”* (1969), she copied a homonymous work by Martial Raysse from 1965. With these actions, she recontextualised existing art, gender constructs, the concept of originality and commercial imagery of the moment. A clear challenge to the discourse led by art institutions.

<picture>

1. **Institutional Critique:** Some avantgarde movements engaged in "institutional critique" as a form of art itself. This involved creating artworks that directly questioned and challenged art institutions' practices, politics, and ideologies. *Hans Haacke’s* work often explores the politics and economics of art institutions. His piece "Shapolsky et al. Manhattan Real Estate Holdings, a Real-Time Social System, as of May 1, 1971" investigated the financial interests of an art gallery.

### Art and the status quo of society

In the previous two sections, we followed (Burger 1984) and (Drijkoningen, et al. 1991) and their argument that one of the intrinsic motivations of the historical avantgarde movements was a reaction to the rise of the bourgeois society and the autonomy of art and autonomous art institutions. We also suggested that several other neo-avantgarde movements reacted similarly to art's autonomy and its institutions. This brings us to a third common characteristic of avantgarde movements: the challenge of the status quo.

*“Fountain”* by Marcel Duchamp is one of the most iconic Dadaist works of the historical avantgarde movements. As an illustration of how avantgarde movements challenge the status quo, let’s recall some of the steps that lead to *“Fountain”* and the concept of non-art. For this, we should go back to the nineteenth-century Paris and the “Salon des Beux-Arts”.

The “Salon des Beux-Arts” was the central institution that defined art at their time. The Salon defined art essentially as tableaus[[6]](#footnote-6) , and anything that would not fit this will not be accepted to be exposed in the Salon. For example, “*Masked Ball at the Opera”* by Édouard Manet was refused by the Salon in 1873.

Such institutionalisation meant that the careers of several artists depended on the decisions of the Salon jury because being exposed at the Salon was a synonym for “good art”. This induced several protests of refused artists and attempted alternatives, but they had little effect. In 1863, Napoleon III granted the refused artist an alternative exhibition space, the *“Salon des Refuses”*. But even with the emperor's blessing, this had the opposite effect than expected:

*“It is a mistake, then, to read the Salon des Refusés as an “alternative” exhibition and as the*

*glorious revenge of the Avantgarde against academicism: The public flocked to the Refusés mainly to laugh at the rejected works, and in many instances the crowd was right. As the critic Jules-Antoine Castagnary wrote in L’Artiste, “Before the exhibition of the Refused, we were unable to figure out what a bad painting was. Now we know it.”* (De Duve 2014)

In 1884, the Société des Artistes Indépendants was founded. The Société’s no-jury rule implicitly contained the a priori admission that anything a member would present counted as potential art.

*“What the Société did not foresee, even though it logically followed from its no-jury rule, was that a betrayal of said rule automatically amounted to the denial of the rejected work’s potential art status. Whatever the Société refused to show would ipso facto be tossed into the limbo of non-art, where it would keep company with Le Bain, Masked Ball at the Opera, and all the other paintings that had been banned from public view over the years because the Salon jurors could not, would not, admit that the works were tableaux worthy of the name.”* (De Duve 2014)

However, even with the no-jury rule, Marcel Duchamp’s *“Nude Descending a Staircase (No. 2)”* was expelled from the 1912 Salon des Indépendants. Hence, as mentioned above, it qualifies as non-art. The rejection was *“presumably for not being a tableau cubist worthy of the name”* (De Duve 2014)

After such events, Marcel Duchamp moved to New York, where he witnessed the creation of the New York Society of Independent Artists in 1917. When he was part of the board, again, this society planned an exhibition with no-jury rule.

Duchamp then submitted the piece *“Fountain”* under the pseudonym R. Mutt.

*“Objections, on both aesthetic and moral grounds, were immediately voiced, and an emergency meeting of the society’s directors was called to decide whether R. Mutt’s contribution was to be accepted. Heated arguments were heard from opposing viewpoints before the issue was finally put to a vote”* (De Duve 2014)

The piece was not publicly exhibited. It still generated discussions that are followed even nowadays.

*“Fountain”* challenged the status quo of the time on several levels. (De Duve 2014) presents the following:

* When a urinal is art, anything can be art.
* Anyone can be an artist.
* “Independent art institutions” actually create a monopoly in the art practice.

Such reactions to the status quo did not stop with the historical Avantgarde. We can also see it in neo-avantgarde movements.

For example, Elaine Sturtevant pioneered the *Appropriation Art* movement, which involved appropriating/copying other artists’ work. We will look more into this in the last chapter from the perspective of digital art.

In 1969, Elaine Sturtevant replicated Martial Raysse's 1965 artwork, "Haute Tension." Through her work, Sturtevant challenges several aspects of the status quo.

In the first place, Sturtevant challenges the prevailing belief of her time, which emphasised technique as the paramount aspect of art. She contends that neither the visual concept nor the execution holds the primary value; instead, the artist's intention lies at the core of the artwork. Consequently, deliberately reproducing an artwork can still result in a piece of significant artistic value worthy of inclusion in institutions like the Stedelijk Museum in Amsterdam.

In the second place, she challenged the gender bias of her time. At her time, all[[7]](#footnote-7) works in museums and galleries were by male artists. Moreover, by copying several other works by male artists, she illustrated that there was a gender bias, and it was not only the technique or concept of the art piece.

The Stedelijk Museum proved her right by showing both works side by side in its permanent collection.

Also, the art market proved her right. Several of her pieces have sold for more than the original piece. In 2007, an original *Crying Girl* by Roy Lichtenstein sold at auction for $78,400; in 2011, Sturtevant’s canvas reworking of *Crying Girl* sold for $710,500.

### Art and everyday life

The cases of Elaine Sturtevant and Duchamp show how an artist can integrate their practice into the reality they live in. This brings us to the fourth common characteristic of avantgarde movements we will use during this thesis. Namely, the position of art in everyday life.

More explicitly, a common characteristic of avantgarde movements is the integration of artistic practice in the praxis of life.

The lecturers of the Bauhaus, like Johannes Itten, advocated for integrating all art practices and everyday life.

*“Itten taught under the motto 'Play becomes party - party becomes work - work becomes play'. The same link between work and play was in Gropius's mind when he wrote the Bauhaus Manifesto: 'Theatre, lectures, poetry, music, costume balls. Creation of festive ceremonies in these gatherings.' And indeed, the everyday life of the Weimar 'Bauhäusler' was punctuated by many such events. Gropius introduced Bauhaus evenings of literary readings … with the intention of bringing together the local population and the youth of the Bauhaus.”* (Magadalena 2023, 79)

This is even more explicit and strongly formulated in the Bauhaus manifesto:

*“The art schools of old were incapable of producing this unity—and how could they, for art may not be taught. They must return to the workshop. This world of mere drawing and painting of draughtsmen and applied artists must at long last become a world that builds. When a young person who senses within himself a love for creative endeavour begins his career, as in the past, by learning a trade, the unproductive “artist” will no longer be condemned to the imperfect practice of art because his skill is now preserved in craftsmanship, where he may achieve excellence.*

*Architects, sculptors, painters—we all must return to craftsmanship! For there is no such thing as “art by profession.” There is no essential difference between the artist and the artisan. The artist is an exalted artisan. Merciful heaven, in rare moments of illumination beyond man’s will, may allow art to blossom from the work of his hand, but the foundations of proficiency are indispensable to every artist. This is the original source of creative design.”* (Gropius 1919)

These ideas led to the design of functional and aesthetically pleasing objects for everyday use. Two famous examples that still can be found nowadays would be the Wassily Chair by Marcel Breuer and Door Knob by Walter Gropius. Even more, the influence of the Bauhaus in the field of design can still be seen in how there is a general attention for good design of everyday objects.

<pictures>

As shown in the DW documentary on the Bauhaus (DW Documentary 2019), the integration of art into everyday life was also seen in the Bauhaus teaching method that replaced the traditional pupil-teacher relationship with the idea of a community of artists working and living together. The Bauhaus aimed to bring artists/students back into contact with everyday life. Therefore, architecture, performing arts, design, fashion and even parties were given as much weight as fine arts.

## Section summary

In this section, we illustrated how the historical Avantgarde and neo-avantgarde movements' challenge to the autonomy of art influenced cultural change, including a shift away from traditional notions of art as an isolated, purely aesthetic pursuit and from the institutions surrounding it. They advocated for art to be more engaged, politically aware, and socially relevant. This perspective played a crucial role in shaping the direction of avantgarde art in the 20th century and beyond. The impact of these ideas is still felt nowadays.

The connection of technology, computers and digital media with the avantgarde movements will be discussed in the next chapter.

# Unstable Media

We are immersed in a digital age where technology and information mediate most of our interactions. Artistic practice has not been immune to this. Around 1984, there was a pivotal point where artistic practice moved from a primarily analog to a predominantly digital practice (Moller Hansen 2023). The digital practice involves using computers but, more generally, using so-called unstable media.

This chapter will briefly summarize and define what I mean by unstable media and related terms.

Broadly speaking, “Unstable Media Art” describes a category of contemporary art that incorporates technology and digital media as integral components of artwork. The Unstable Media Manifesto (V2\_ 1987) defines unstable media as follows:

*“…all media which makes use of electronic waves and frequencies, such as engines, sound, light, video, computers, and sound. Instability is inherent to these media.*

*Quantum mechanics has proved, among other things, that the smallest elementary particles, such as electrons, exist in ever-changing forms. They have no stable form, but are characterized by dynamic mobility. This unstable, mobile form of the electron is the basis of the unstable media.*

*The unstable media are the media of our time. They are the showpieces in our modern homes. We promote their comprehensive use, instead of the often practised misuse of these media…”*

The manifesto then goes into the possibilities of unstable media:

*“…the unstable media move within the concepts of ‘movement-time-space’, which implies the possibility of combining more forms and contents within one piece of work. The unstable media reflect our pluriform world.*

*Unstable media are characterized by dynamic motion and changeability, this in contrast with the world of art which reaches us through the publicity media. This has come to a standstill and has become a budget for collectors, officials, historians, and critics…”*

### Illustration, Light-Space-Modulator

At first glance, it may seem that unstable media is related to computers and digital media. However, this is not necessary to make an unstable media artwork. Let’s take the example of the “Light-Space Modulator” (1930) by Laszlo Moholy-Nagy. Here is a description of the work by Moholy-Nagy himself:

*“This piece of lighting equipment is a device used for demonstrating both plays of light and manifestations of movement.*

*The model consists of a cube-like body or box, 120 x 120 cm in size, with a circular opening (stage opening) at its front side. On the back of the panel, mounted around the opening are a number of yellow, green, blue, red, and white-toned electric bulbs (approximately 70 illuminating bulbs of 15 watts each, and 5 headlamps of 100 watts). Located inside the body, parallel to its front side, is a second panel; this panel too, bears a circular opening about which are mounted electric lightbulbs of different colors. In accordance with a predetermined plan, individual bulbs glow at different points. They illuminate a continually moving mechanism built of partly translucent, partly transparent, and partly fretted materials, in order to cause the best possible play of shadow formations on the back wall of the closed box. (When the demonstration occurs in a darkened space, the back wall of the box can be removed, and the color and shadow projection shown on a screen of any chosen size behind the box.)*

*The mechanism is supported by a circular platform on which a three-part mechanism is built. The dividing walls are made of transparent cellophane, and a metal wall made of vertical rods. Each of the three sectors of the framework accommodate a different, playful movement study, which individually goes into effect when it appears on the main disc revolving before the stage opening.*

*The first sector’s playful movement study: three rods move jerkily (since the plan of the edges and base are somewhat different) on an unbroken path. Different materials, translucent screening, parallel horizontal rods, and wire netting are mounted to the three rods.*

*The second sector’s playful movement study: found within three levels arranged one behind the other is a large immobile aluminium disc; moving up and down in front of this is a small, bent and highly-polished perforated brass disc; at the same time—between the two—a small ball is set in motion as if on a roller coaster.*

*The third sector’s playful movement: a glass rod topped by a spiral of glass. This describes, in the reverse, the movement of the pin of the large disc, whose tip touches the base made of a diagonally-arranged and sector-shaped glass disc, levitating over a reflecting circular platform.*

*This piece of lighting equipment can be used to arrive at countless optical conclusions, and it seems correct to me that the development of these attempts be continued as planned, as a way to approach the designing of light and movement.”* (Moholy-Nagy 1930)

An important point to notice here is that the Light-Space-Modulator artwork is not only the sculptural (physical) object but also how that object interacts with the space. When the “Light-Space-Modulator” is turned on, the different pieces move and then reflect the light in the room, creating abstract forms and movements over the surfaces of space where the piece is located. Since space and light on it are unstable, the “Light-Space-Modulator” was intentionally designed to embrace this instability.

The Light-Space-Modulator embraces the fusion of art and technology as promoted by the Bauhaus school. This is a connection of unstable media with the avantgarde movement.

László Moholy-Nagy (1895-1946) was a Hungarian painter, photographer, filmmaker, graphic designer, and influential figure in modern and avantgarde art. He is particularly known for his contributions to the Bauhaus school and his pioneering work in multiple artistic disciplines. The Light-Space-Modulator is considered a pioneering piece in the field of kinetic art and unstable media (The Art Story 2023).

His view on the autonomy of art and autonomous art institutions can be seen in his Bauhaus teaching. *“When Walter Gropius invited him to teach at the Bauhaus, in Dessau, Germany, he took over the school's crucial preliminary course, and* ***gave it a more practical, experimental, and technological bent****. He later delved into various fields, from commercial design to theatre set design, and also made films and worked as a magazine art director.”* (The Art Story 2023)

Also, he believed that artists should address new technologies like the photo camera.

*“His interest in photography encouraged his belief that artists' understanding of vision had to specialize and modernize. Artists used to be dependent on the tools of perspective drawing, but with the advent of the camera* ***they had to learn to see again. They had to renounce the classical training of previous centuries****, which encouraged them to think about the history of art and to reproduce old formulas and experiment with vision, thus stretching human capacity to new tasks.”* (The Art Story 2023)

He also believed that artists had the potential to challenge the status quo of modernity by embracing new technologies. *“Moholy-Nagy believed that humanity could only defeat the fracturing experience of modernity - only feel whole again - if it harnessed the potential of new technologies. Artists should transform into designers, and through specialization and experimentation find the means to answer humanity's needs.”* (The Art Story 2023)

As we can see, almost half a century before the V2 Unstable Media Manifesto, the seed of unstable media thinking was present in key figures of the (historic) avantgarde. There are several essential points to notice here. In the first place, notice that the art object produced by the Light-space modulator is not only the machine itself but the whole context in which it is placed and activated. The aesthetic object behind the Light-space modulator is not static but dynamic. This includes its interactivity with the space, time, and viewers. Such a change of perspective will be essential for our look at computer art and the avantgarde in the following chapters.

# 

# Computer art

The example of the Light-space modulator showed that computers are not necessary for unstable media to take artistic incarnations. However, computers are one of the main mediums in which unstable media takes on an aesthetic side.

<note on coda>

## The digitalisation of life

From the beginning of robotics and artificial beings, there has been the assumption that humans are at a higher level than those artificial beings.

Consequently, when an A.I., robotics, software, hardware, or computers make a breakthrough in human-like behaviour, the question arises whether the machine has become human.

We saw such a situation when AlphaGo cracked the game of G.O. (Khos 2017), or when an A.I. produced a piece of art that was sold for an exorbitant price (Christie's 2018), and the consequent articles on what this means for creativity, e.g. (Hyde 2022). In addition to this, we see that most literature and films present a future where machines are taking over, resulting in the enslavement, or destruction, of humans.

These situations are based on the Anthropocene way of thinking (Most 2020), where humans are on top and everything in the ecosystem is there to serve them. However, we could also drop the human-centred perspective and take a flat ontology perspective where there is no hierarchical relation where humans are on top of all the other entities in the ontology (Braidotti en Hlavajova 2018, 296).

In this perspective, asking whether the machine has become human is the wrong question. We should instead ask: how artificial or mechanical have humans become?

Media theorist Marshall McLuhan argues that technological developments are extensions of our humanity (McLuhan and McLuhan 1988). For example, a car is an extension of mobility capabilities. Computers enhance our calculation speed and the information we can retrieve and store. A significant difference between the computer and other media is that it can transform any medium into any other medium (McLuhan and McLuhan 1988). This has given rise to a hypermediality in the way we perceive the world. McLuhan refers to this as the acoustic space; in his words:

*“… with the rise of radio, television, the world wide web, and new media in general, a big flip took place in our time. This is the changeover from the eye to the ear. Most of us, having grown up in the visual world, are now suddenly confronted with the problems of living in an acoustic world which is, in effect, a world of simultaneous information. The visual world has very peculiar properties, and the acoustic world has quite different properties. The visual world which belongs to the old nineteenth century, and which had been around for quite a while, say from the sixteenth century anyway, has the properties of being continuous and connected and homogeneous, all parts more or less alike. Things stayed put. If you had a point of view, that stayed put.*

*The acoustic world, which is the electric world of simultaneity, has no continuity, no homogeneity, no connections, and no stasis. Everything is changing. To move from one of those worlds to the other is a very big shift. It’s the same shift that Alice in Wonderland made when she went through the looking glass. She moved out of the visual world and into the acoustic world when she went through the looking glass”.* (McLuhan 1970)

The exponential development of microprocessors in the last few decades has significantly shifted our understanding and interaction with digital tools. Flusser argued that the Romanian revolution, occurring during his time, was a mediated revolution (Flusser 1990), making it an extraordinary event. However, contemporary events like the Ukraine-Russia and Israel-Hamas conflicts illustrate that what were once considered extraordinary happenings have become commonplace. Notably, depending on one's physical side of the conflict, media and technology will influence and manipulate our notions of morality and self, our superego and ego, shaping our perception of identity.

As a personal example, in the era before smartphones, navigating from point A to an unfamiliar point B would involve using a map or asking for directions, requiring basic skills like remembering telephone numbers. Nowadays, attempting to find my way to an unknown location without Google Maps on my smartphone induces stress, and there's a risk of getting lost. In my case, various technological augmentations, such as my phone and computer, have become indispensable. While not physically embedded in my organic body (yet), they have become integral for me to function effectively in contemporary society.

### Of Ghosts and Shells

Another crucial aspect tied to the rise of hypermediality in shaping our perception of the world is that the term "world" is no longer confined solely to the "physical world." The advent of hypermediality is that we now have alternative "digital worlds" where individuals can establish a distinct existence and identity. In the well-acclaimed film Ghost in the Shell (Oshii 1995), and the associated franchise, this duality is explored under the concepts of Ghost and Shell.

A Ghost can be compared to the Western concept of the soul. The main difference is that the soul belongs to the spiritual world, whereas a Ghost belongs to the world of science.

A Shell is a physical object that can host a ghost. For example, it can be a human body, an animal body, a cybernetic body, or a machine.

At the beginning of the first film, a Ghost is understood as what defines humans. In other words, the difference between a human and a robot is that the former has a Ghost, whereas the latter does not.

During the films, this concept of Ghost evolves to not being only a defining characteristic of humans but of living beings in general. That means that other non-human beings would also have a Ghost. Moreover, there can also be living beings that come into existence without a shell[[8]](#footnote-8).

A Ghost is what defines sentient beings and life in general. A Ghost retains its “humanity,” or living force, regardless of how much biological material is replaced by cybernetic parts. Since a Ghost is in the realm of science, it can be transferred from one shell to another. It can also be hacked to make it believe it is something other than it originally was.

### We are all cyborgs…

In 1995, when the first Ghost in the Shell film was aired, these ideas were seen as Sci-Fi dissociated from physical reality. However, nowadays, my Facebook, Instagram, and LinkedIn profiles, digital data the government has collected, and many faces on the blockchain are essential to my identity beyond my physical body. Without them, I will be just a shell.

In this perspective, we could rephrase Donna Haraway’s discussion on companion species (Haraway 2003), and argue that technology has become, to me, a companion species. I spend more time with my phone than with my dog, and most of my interactions with other humans are mediated by technology.

The way we fuse with technology and the several identities this facilitates brings us back to the cyborg perspectives of Donna Haraway (Haraway 2015). Following her definition of a cyborg, I can say that I am a cyborg because I am a collection of individualities. I have my organic body, but I have a presence on Instagram, Facebook, DigiD, and several blockchains. I use several shells to exhibit part of my Ghost(identity).

The digitalisation of life does not stop at the individual. The international world order is witnessing the rise of another type of power beyond economic and military. Namely, the digital is also a dominant power in the international world order (Bremmer 2023). A good illustration of this is the US election of 2020, where technology companies took an active role in “saving the democratic process”. Important to notice here is that up until now, digital power structures have not been managed by governments but by private corporations[[9]](#footnote-9).

As humans, we are moving into posthumanism, where the organically physical body is no longer the gravitational centre but our fusion as one being with technology in the sea of information.

All this illustrates how computers are changing our reality in a broader sense. We will now focus on how computers require a different perspective when creating art objects.

## Computer art vs Traditional art – Practical differences

Paul Valery, quoted by Walter Benjamin (Benjamin 1969), says: *“In all the arts there is a physical component which can no longer be considered or treated as it used to be, which cannot remain unaffected by our modern knowledge and power.”*

This section will discuss that physical component when computers are involved. In the later sections, we will discuss differences in the perception of traditional and digital aesthetic objects.

Computer art, or digital art, incorporates algorithms, digital technology, and computers in the creative process.

Matt Pearson, one of the precursors of the Processing language, sees it as follows: *“This revolution would be impossible without a new understanding of software as a cultural artifact. Where we once saw text processors as literal typewriter replacements, we now download and exchange apps as a popular pastime. Websites that used to be closed domains of proprietary information now sport public APIs, enabling professionals and enthusiasts alike to create ever popular “mashups” based on their data.*

*In the creative field, the most significant development is the realisation that software [and hardware] processes aren’t simply tools, but can become the very material from which works are made… …A new generation of electronic artists has turned to code as fertile ground for conceptual and formal experimentation, simultaneously providing a pragmatic framework for computational creativity and a theoretical context for the created artwork.”* (Pearson 2011, x)

### Three paradigm shifts

Another point to Pearson’s view is that already in the 1960’s, artists were using computers for creative purposes. Several shifts of paradigm have been needed for this to happen.

#### From static to dynamic objects

The first paradigm shift arises because working with a computer requires transitioning from viewing the art object as a static entity, detached from the artist and the viewer. Instead, a new perspective emerges, wherein the artwork transforms into a dynamic object that interacts with the artist and the viewer. Furthermore, technology facilitates a "conversation" involving the artist, the machine, and the evolving artwork within the creative process. This aligns closely with the principles outlined in the Unstable Media manifesto discussed in the previous section. The creation process and the artwork itself, under this paradigm, evolve into a cybernetic system where a feedback loop becomes an integral aspect of the piece. We will delve into this in more detail in the next section.

This means a different way of thinking is needed to make art with computers. As stated by Matt Pearson, *“With more traditional art forms—sculpture, painting, or film, for example—an artist uses tools to fashion materials into a finished work. This is clearly doing it the hard way. With generative art, the autonomous system does all the heavy lifting; the artist only provides the instructions to the system and the initial conditions. The artist’s role in the production process may be closer to that of a curator than a creator. You create a system, model it, nurture it, and refine it, but ultimately your ownership of the work produced may be no more than a parent’s pride in the work of their offspring.”* (Pearson 2011, 4)*.*

#### Technical craftsmanship in the praxis of artistic practice

This brings us to a second paradigm shift that relates more directly to the avantgarde perspective. Namely, the difference between the “digital artist” and the “software engineer” becomes very diffuse. This is very well aligned with the historical avantgarde movement of the Bauhaus that promoted the abolishment of differences between the artist and the artisan; in Walter Gropius's words, “The artist is an exalted artisan” (Gropius 1919). I would reformulate this by claiming that “the digital artist ought to be an exalted software engineer”.

A first argument on why artistic practice with computers requires a fusion between art and craftsmanship is that technology is not usually developed or designed for artistic purposes. We can argue that “art is mind over matter” (Mul 2018); because of this, using technology as an artistic medium requires the artist to have the craftmanship to hack the machine to do something it was not intended to do.

A second point is that generic tools for general artistic purposes like Processing, p5.js, or TouchDesigner are programming languages. Therefore, working with those requires that the “artist” learns to program with them. For example, Processing and p5.js are dialects of Java and JavaScript, respectively. Their syntax has been designed to be simple and accessible, making it suitable for those with little or no programming experience. They abstract many of the complexities of underlying programming language and are well suited for graphics and interaction tasks. However, even with those, there is no way around writing the code.

One may think that the “artist” could hire a “software engineer” to do the programming. The problem here is that without the knowledge of “programming”, the artist can no longer modify the program. Hence, the artist must become skilful enough to express their vision in the system. An alternative to this is that the artist becomes part of a team that can do it[[10]](#footnote-10). This is already a switch from the view of the traditional artistic practice that places the “artist” as an isolated individual.

This argument still works for less code-intensive tools like Photoshop or Illustrator. The artist should be able to use the tool themselves and have enough knowledge of the process or tool to be part of a team producing the “art objects”.

The digital artist as an exalted software engineer also goes the other way around. Technically skilled people interested in the use of technology for creative purposes ought to realise that technical considerations are not necessarily the most important driver for digital creative practice. Given that the work will often be teamwork, communication and collaboration skills will be necessary for success. From my experience, I have met several technically skilled people with whom I cannot collaborate for artistic purposes because they find it difficult to compromise between technical correctness and collaboration over artistic purposes.

Timo Hoogland created a programming language, Mercury, to make music. He is actively promoting its adoption to different audiences and describes the above point as follows: *“My workshops on Mercury are attended both by people from computer science backgrounds and music backgrounds. I have noticed that those from a computer background are very quick to grasp the syntax and technicalities of Mercury but have difficulties making music with it. It is musicians who can leave the technicalities aside and quickly start making music with it. Mercury was made to make music.”* (Hoogland 2023)

#### Embracing remediation

A third change in paradigm is that working with computers by nature implies mapping information from one format to another.

The following example presented by Marije Baalman (Baalman 2022) illustrates this:

*“A performer sits on stage, a cello in front of his body. With the bow, he plays a few tones, and now he takes the bow off the strings and just moves the bow in the air, transforming the sound that was just played; almost invisible to the audience, he uses his feet on pedals that are taped to the stage floor. The performer controls the moves of the bow in particular and expressive ways, as he listens attentively to the resulting sounds. Occasionally, he reaches out with his left hand to a side table, where he moves some knobs or sliders, or presses a button. Alternating between playing sounds on the cello, moving the bow, and pressing the pedals, he builds up several layers of sound that together form a melodic and rhythmical structure. As an audience member it is fascinating to watch Andi Otto play his Fello. The type of music that Andi Otto produces is often performed from behind a table, with a performer staring at a laptop computer screen. But with the Fello, you can see how the music is created: what the source of the sound is, and how it is manipulated and modulated into electronic sound with a very organic feel to it. The worlds of the cello and of dub music meet as Andi is transforming the sound of the cello with the bow.”* (Baalman 2022, 19)

Marije Baalman points out that in the piece above, there is a mapping that is essential to interactive work. I add to this by saying this mapping is essential to digital works. In terms of modern media theory, this can be rephrased by saying that remediation is inherent to working with computers. More on the conceptual implications of this in later sections.

In (Baalman 2022) Marije Baalman illustrates a general pattern for the mappings involved as follows:

* A gesture is performed in the environment.
* This is captured by a sensor that translates the gesture into an electronic signal.
* The signal is processed by an electronic circuit, often to digitise it.
* Next, the signal enters some sort of computational model that translates the data into parameters.
* These parameters control an output medium such as sound, light, video, or mechatronics.

*“At each step in the process, there is a translation or a mapping problem: how is the output of one step connected to an input of another step? What happens inside each step? Of course, this is a simplification of the steps involved, and there are many variations possible of this general scheme.”* (Baalman 2022, 25)

A more straightforward example, in the creative coding field, is when written code is compiled and an image appears on the screen. Here, we can send the “image” to a printer to make a physical version of it. Here are three remediations. In the last one, we all have witnessed that this data transformation can often produce unexpected results that interfere with the creative process or production. More complex or less orchestrated remediations like the ones listed above require the digital artist's full attention.

From my personal experience, in my work “Digital Presence” (2023), I aimed to capture visitors’ heartbeats in one station and transmit it to another station so that they could feel a physical sensation of the digital presence of others. Although conceptually simple, managing the remediation of the different data points and ensuring it kept working was far from trivial. After several tests and preparation, it failed in the final presentation.

This is to illustrate that in digital works, even if you take care of how your data is being mapped and believe it is under control, it may come back to haunt you.

Since the flow of data in digital works is usually continuous, digital art requires the artist to embrace those changes.

[add example with Chagall]

### Illustration Vera Molnar – from the imaginary machine to the real machine

Here, I will illustrate the points of the previous section with the work of Vera Molnar, one of the pioneers of computer art[[11]](#footnote-11).

Vera Molnar is a Hungarian French artist known for her contributions to the field of digital art and algorithmic art. She was born on January 5, 1924, in Budapest, Hungary, and studied painting at the Budapest School of Fine Arts. Then, she moved to Paris, where she developed most of her practice.

Despite the social context in which she was educated, Vera Molnar wanted to be an abstract painter. In her own words, *“If I can describe myself, I am a painter, an image-maker of images of a non-figurative kind. I 'create' visual forms in the sense that they consist of combinations of shapes that cannot be found in nature”* (Molnar, Toward Aesthetic Guidelines for Paintings with the Aid of a Computer 1975)

She followed the constructivist tradition. She was not interested in grand concepts but in simple principles and rules that would reveal unexpected beauty. In her words: *“My life has been about squares, triangles, and lines. In this sense, I do not start from grand concepts that create patterns but rather from simple principles and rules and by introducing small variations undisclosed beauty appears”* (Riagamonti and Kennedy 2018).

This is well illustrated with one of the most recognisable works by Vera Molnar, “Structure des Quadrilaters” (year?).

<image>

The first thing to notice is that “Structure des Quadrilaters” is a series of works with many variations over the years. The key point is that the core principle, or process, in all the instances of the series is the same (Molnar, Toward Aesthetic Guidelines for Paintings with the Aid of a Computer 1975, 188):

* Drawings start from an initial square array of like sets of concentric squares.
* By making variations on the variables, a “conversation” between the Author and the computer takes place.In thecase of this work, the available variables are:
  1. *The number of sets,*
  2. *the number of concentric squares within a set,*
  3. *the displacement of individual squares,*
  4. *the deformation of squares by changing angles and lengths of sides,*
  5. *the elimination of lines or entire figures and*
  6. *the replacement of straight lines by segments of circles, parabolas, hyperbolas, and sine curves.*

Thus, a great variety of images can be obtained from an initial grid. In this description, we can see that “Structures des Quadrilaters” is not a fully static object but has a dynamic component which will result in different physical “aesthetic objects” that the artist could not foresee from the beginning.

In (MuDA 2019) she mentions how computer-generated randomness can be a replacement for intuition to make interesting art. This leaves even more room for undiscovered possibilities and adds to the dynamicity of her works.

[add some pictures and perhaps some code]

Something to point out here is that in the time of Vera Molnar, graphic interfaces were not as well developed as they are now. Her early works were mostly done on plotter machines. Therefore, after she had written the code, she had to wait for the machine to reinterpret into a print on the paper. That is, remediation was at the core of her practice.

“Structure des Quadrilaters” is an example of her process. She describes her creative process more generally as follows:

*“Whenever I begin a picture, I have an initial idea of it in mind. The procedure that I use to arrive at the final work, to be described below, is tedious if carried out by hand. Furthermore, the final picture rarely corresponds to my initial idea of it.*

*I develop a picture by means of a series of small probing steps, and each step is followed by evaluation. In my opinion, painters should employ such a procedure, especially if they consciously wish to learn what kind of aesthetic importance is occurring on the canvas as the painting develops and what effect the work may have on viewers. Making a series of pictures that are alike except for the variation of one parameter is not uncommon”* (Molnar, Toward Aesthetic Guidelines for Paintings with the Aid of a Computer 1975, 186)

Paraphrasing (Nierhoff 2018), a more detailed way to describe Vera Molnar's process would be as follows:

She will set up a set of rules, follow them, and modify the rules according to the results. Before she had access to computers, she would become an *“imaginary machine”* for which she would execute the rules and make the results.

However, as pointed out by Vera Molnar in (Molnar 1975), this stepwise procedure has two essential disadvantages if carried out by hand. Above all, it is tedious and slow. To make the necessary comparisons in a developing series of pictures, one must make many similar ones of the same size and with the same technique and precision. Another disadvantage is that, since time is limited, one can consider only a few of many possible modifications. Furthermore, these choices are influenced by disparate factors such as personal whim, cultural and educational background, and ease of execution.

When she was able to get access to a computer in 1968 (Nierhoff 2018, 6), her “imaginary machine” became a “real machine”. She described this change as follows: *“The computer, with its unmanageable potential of image variations, is an optimal device. When it comes to digital images, the absence of their seclusiveness accom­modates the artist’s experimental scientific approach because, behind the single picture, there is always the image category that also needs to be considered. By means of random generators, chance can introduce interference into the program at various stages. As a consequence, new variations can be continuously calculated and real­ized as images. The selected images thus constitute only limited material expressions of a virtually infinite consec­utive chain.”* (Nierhoff 2018, 10)

Notice how Vera Molnar talks about a “conversation” between her and the machines in these citations. This aligns with the avantgarde thinking of Maholy-Nagy we discussed in previous sections.

On the view of software development in the praxis of artistic life, Vera Molnar thought that... *“…the computer, on its own, does not have the capacity to create art, however: it is a very good assistant, but it is a little bit stupid, a lot must be explained to it.”* (Nierhoff 2018, 7). However, she recognises that the computer was often more innovative than what she, or humans, could achieve *“Time and again, I have compared both forms of chance, one generated by me and the other resulting from mathematical probabilities, only to realise that my self-generated chance was much less innovative”* (Nierhoff 2018, 9).

She embraced the use of computers also to conceptualise her art practice: *“Thanks to computers, the concept of form, in the broader sense, could be reduced to a lack of randomness with an organised set of elements”* (Molnar en Molnar 1989)

Aligning to the avantgarde principles, she also does not ignore the position of art in society. She rejects the autonomy of art *“I do not make drawings and paintings with the aid of a computer solely for personal satisfaction; I hope that others will also enjoy them. I do not agree with the notion of art for art's sake and of science for the sake of science. Sartre convincingly explains why this notion is untenable. I, personally, know of no artist who refuses to let people see his work. On the other hand, I do not believe that an artist should go to the extreme of ignoring his own taste and convictions in order to please others. There should be an intermediate ground where aesthetic satisfaction is experienced mutually.”* (Molnar 1975, 189)

All this illustrates the three paradigm shifts of working with computer art together with the relation to the avantgarde movements.

## Digital art objects vs Traditional art objects – Conceptual differences

In the previous section, we discussed the practicalities of artistic practice when computers are involved. We hinted at several points that such practicalities also implied more conceptual differences in how aesthetic objects are perceived when digital media is involved. In this section, we will go deeper into those differences.

To illustrate the type of questions we will address, let’s recall the example of “Structure des Quadrilaters” by Vera Molnar. We mentioned that this is a series of works which share an underlying common process for creation. From a traditional perspective, we could say that the printed images in a series are the art object. However, this perspective ignores the underlying process and the relationship between the artist and the machine during the creation process. This raises several questions on the conceptual level of practice and the work itself:

* What is the relation between the artists, the work, the machine and the process?
* What kind of artist mindset does this type of creative practice need?
* Which art theory can be used for this kind of creative practice?
* Although each series has aesthetic qualities, are two different series different aesthetic objects?
* Generally speaking, we could ask: what is the aesthetic object underlying “Structure des Quadrilaters”?

### The new “digital artist”

We begin by looking at the creative practice and the relation of the parties involved, i.e. artist, machine, process.

As mentioned in the previous section, randomness is at the core of Vera Molnar's creative practice. In (MuDA 2019) she describes how she systematically uses randomness to broaden her perspective and explore the possibilities of the aesthetic object she is interested in. In (Molnar en Molnar 1989) she goes even further, using randomness to formally define form.

This approach of systematic restriction of the field of study and formal definitions is often used in science. At first glance, it may seem that a methodological approach would not be suitable for art practices. However, this is one of the changes digital media brings to the table. Claudia Gianneti expresses this as follows:

*“While science, says Weibel, is distinctly methodological in character, art is generally not regarded as a method: «This is our first claim: art and science can only reasonably be compared if we accept that both are methods. This does not mean that we declare that both have the same methods. We only want to declare that both have a methodological approach, even if their methods are or can be different.”* (Gianneti 2004)

Peter Wiebel in (Peter 1998) elaborates on how digital media bring science and art closer to each other. Jack Burnham places this change of paradigm in the context of scientific revolutions as follows:

*“In a way this situation might be likened to the "morphological development" of a prime scientific concept as described by Thomas Kuhn in The Structure of Scientific Revolutions (1962). Kuhn sees science at any given period dominated by a single "major paradigm"; that is, a scientific conception of the natural order so pervasive and intellectually powerful that it dominates all ensuing scientific discovery…*

*…the artist operates as a quasipolitical provocateur, though in no concrete sense is he an ideologist, or a moralist. “l’art pour l’art” and a century's resistance to the vulgarities of moral uplift have insured that…*

*…Scientists and technicians are not converted into "artists," rather the artist becomes a symptom of the schism between art and technics. Progressively the need to make ultrasensitive judgments as to the uses of technology and scientific information becomes "art" in the most literal sense.”* (Burnham 1968, 31)

This aligns at a higher level with the paradigm change of “technical craftsmanship in the praxis of artistic practice” mentioned in the previous section.

The new “digital artist” requires technical craftsmanship, methodological thinking, and collaboration skills. For the new digital artist, the boundaries between science, art and technology should be diffused and purposely disrespected.

### Digital practice vs art theory

Unfortunately, Claudia Gianneti points out that this new way of working required by digital media and the way art theory has been developing are diverging instead of converging:

*“…the profound transformations resulting from these new [technological] approaches did not invariably meet with understanding, let alone acceptance, from artists. If one further takes into consideration the recently re-ignited controversy about the long-predicted crises of art and philosophical aesthetics, as well the widespread discourse among postmodernist writers which was linked to tendencies in technological and academic theory, then everything does in fact seem to point toward a disintegration of art and aesthetics. Yet a large part of such polemics can be attributed to the fact that aesthetic theory and artistic practice have gone separate ways. Artists’ increasing use of technology is bringing to light a far-reaching and on-going discrepancy between artistic perception, art theory, and aesthetics, which are seen to be notably diverging instead of developing synchronously and congruently.”* (Gianneti 2004)

This nicely illustrates how the Rietveld Academy involves technology in the theoretical and practical education. For example, Studium Generale is one of the largest platforms in the Rietveld Academy to address art theory. If we look at the list of topics for the 15 editions (Rietveld 2023) we have the following:

* 2023 — 2024 -- TECHNODIVERSITY — Beyond datafication and digital colonialism
* 2022 — 2023 -- REFUGE – fleeing, flowing, leaking
* 2021 — 2022 -- OCEANIC IMAGINARIES — How can we liquefy our ways of being? How can we think from and with the ocean?
* 2020 — 2021 -- RESILIENT BODIES  — Strategies and Practices for Fluid Embodiments
* 2019 — 2020 -- RELATING (TO) COLOUR
* 2019 -- THE ART OF CRITIQUE  —  Image Power
* 2018 — 2019 -- TAKE A WALK ON THE WILD SIDE  — Fabulating Alternative Imaginaries in Art and Life
* 2018 -- WITHIN AND AGAINST THE ACADEMY — Study, Rehearsal and Improvisation
* 2017 — 2018 -- HOLD ME NOW  — Feel and Touch in an Unreal World
* 2016 — 2017 -- WHAT IS HAPPENING TO OUR BRAIN?  — Art & Life in Times of Cognitive Automation
* 2015 — 2016 -- BOTS, BODIES, BEASTS  — The art of being Humble
* 2014 — 2015 -- Are you alive or not?  — Looking at ART through the lens of THEATRE
* 2013 — 2014 -- VOICE ~ Creature of Transition
* 2012 — 2013 -- WHERE ARE WE GOING, WALT WHITMAN?  — An ecosophical roadmap for artists and other futurists
* 2011 — 2012 -- WE ARE THE TIME  — Art Lives in the Age of Global Transition

Here, we can see that in 15 editions in the last 10 years, only three have addressed technology in the title. Even in the one of this year on Technodiversity, the topic is presented as follows:

*“Our lives are subject to processes of datafication through which big tech companies and governments extract data from us for profit or social and political control. The material thus collected is fed into the algorithms and artificial intelligence trained to monitor human behaviour. In digital capitalism, or ‘data colonialism’ life is appropriated as a resource and managed and traded in the form of data. This not only perpetuates existing inequality and discrimination, but also leads to new injustices and power imbalances. How can we resist data colonialism and produce alternative technologies?*

*The concept of technodiversity can provide insights that cannot be reduced to capitalist extraction. Technodiversity recognises that technologies are temporally and spatially produced by different knowledge systems, ideologies, political interests, economic forces and cultural practices. This liberating perspective can create space for collectives, peoples, and identities to produce and control their own data – no data, small data, indigenous data, more-than-human data, feminist data, queer data – and not be governed by Big Data and oppressive algorithms.”* (Rietveld 2023)

Even though the topic addresses technology, it addresses how technology plays a role in society. It does not mention the creative practice based on technology. There is no explicit mention of how technology and artistic practice relate.

On the practical side, the university offers 23 workshops open to all students. Of those workshops, at most three focus on creative practice using digital media. Those are: X-Lab, CAD/CAM and computer workshop. Even of those, only the X-lab addresses unstable media as defined in the unstable media manifesto. The X-lab is the only workshop where there is support for students using coding for their practice. The X-lab has one employee and is open three days per week, 21 hours per week. The Rietveld Academy has about 850 students.

The DogTime Program is not much different. In the six years I have been involved in the institution, I have had two courses (Augmented Realities and UM Lab) that addressed and encouraged creative practice using technology. I have seen no course at DogTime, or the Rietveld Academy, that teaches the basics of programming either practically or conceptually. Even though one of the specialisations is called “Interaction Design and Unstable Media”, the graduation projects in the last five years of the department that address interaction or unstable media are more the exception than the norm.

As Claudia Gianneti said, there is a clear divergence between the theory and practice presented at the Rietveld Academy and creative practice using technology. In her words: *“This gulf between theoretical «corpus» and artistic practice culminates in a paradox that without doubt leads to the often proclaimed end of art.”* (Gianneti 2004)

This means the new “digital creative practice” requires its theoretical frameworks to embrace technical craftsmanship, methodological thinking, and collaboration skills.

Interestingly, we can find a similar situation, where art institutionalisation and practice diverged, that promoted the rise of the historical avantgarde movements.

### The new “digital art object.”

In the traditional aesthetic theory, there is an emphasis on art as a manifestation of an “absolute idea” (Hegel), subjective judgement and disinterested pleasure (Kant). However, those are hard to align in a work like “Structure des Quadrilaters”.

For example, the Hegelian perspective of art as a manifestation of an “absolute idea” would not apply to any of the prints of the work, as the process described is what is at the core of each print. Still, none of the prints is the process itself. The subjective judgement of a disinterested pleasure (Kant) is also not directly applicable to the series or prints of “Structure des Quadrilaters”. As Vera Molnar mentions in (MuDA 2019) she chooses the variations and prints that belong to a series depending on what is interesting to her at that moment.

Claudia Gianneti in (Gianneti, Cybernetic Aesthetics and Communication 2004) calls for a deviation of the Kantian and Hegelian inspired directly by cybernetics. Here information is the key concept to understanding aesthetic processes.

*“Every work of art, in fact every artistic expression, (is) now viewed as a message transmitted by a creative individual (an artist or group of artists), known as the transmitter, to another individual (or group), known as the receiver, over a channel (systems of visual, auditory, and other modes of perception)”* (Gianneti 2004)

From here, she describes the approach of Information Aesthetics where four methods are considered for the aesthetic synthesis:

*“The semiotic, the metric, the statistical, and the topological. The semiotic method is based on the examination of the sign; the metric method, as a sculptural principle, uses parameters such as width, length, number, or ratio in order to define a global structure, the micro-aesthetic, that takes material form as the gestalt or form of the work; the statistical method generates local structures, or a kind of micro-aesthetic; and the topological method, based on relational principles, is directed at variations of a certain gestalt.”* (Gianneti 2004)

The semiotic and metric methods are well known from traditional aesthetic principles. However, the statistical and topological methods imply that aesthetic objects are not purely of a physical nature.

*“This concept is fundamental, since it interprets the aesthetic process as being one of*

*information. It replaces earlier aesthetic interpretative methods with a technique of observation and communication. In other words, works of art are viewed as the mediators of information (aesthetic information): ‘Works of art, it might also be said, are a special (that*

*is to say established, not given) class of ‹carriers› of the ‹aesthetic information›’.*

*The concept of information should here not be understood to mean an unquantifiable message or communication, but an informational content measurable in the transmission and storage of messages. All information on whose transmission communication is based, is built up by means of ‹signs›.”* (Gianneti, Cybernetic Aesthetics and Communication 2004)

This can be aligned with the perspective of System Aesthetics:

*“A "sculpture" that physically reacts to its environment is no longer to be regarded as an object. The range of outside factors affecting it, as well as its own radius of action, reach beyond the space it materially occupies. It thus merges with the environment in a relationship that is better understood as a "system" of interdependent processes. These processes evolve without the viewer's empathy. He becomes a witness. A system is not imagined, it is real.”* (Burnham 1968, 32)

Claudia Gianneti rounds this up by pointing out that:

*“…aesthetic theory is no longer focussed exclusively on the art object itself, but on its process, on system and contexts, on the broad linkage of different disciplines, and on reformulating the roles of the maker and the viewer of a work of art.”* (Gianneti, Digital aesthetics: Introduction 2004)

Moreover, she claims that we should renounce the romantic idea of viewers of art being “passive consumers” dissociated from the work of art itself. Jack Burnham also aligns with this *“Rather the object art has become a stage towards further rationalisation of the aesthetic process in general.”* (Burnham 1968, 32)

I add that if the viewer is not an active part of the piece of art, it falls back into the traditional perspective of art.

I close this part by defining an aesthetic object as a physical or abstract object appreciated for its aesthetic qualities rather than its utility or practical value. Aesthetic qualities can include elements such as form, colour, texture, harmony, balance, composition, emotional experiences, interactive and sensory experiences.

### Relation to the avantgarde

In this chapter, we have illustrated how the new perception of the digital art object requires a rejection of the status quo. This and its relation to the other avantgarde principles was already foreseen in the 1986 Unstable Media Manifesto by V2\_ (V2\_ 1986) where they not only aim to define unstable media but also address how unstable media requires a new type of aesthetics that ruptures from the “traditional” aesthetic and audience of fine arts[[12]](#footnote-12). Here, I have extracted the parts of the manifesto that most illustrate this divergence:

*“WE DO NOT WANT TO BRING EXISTING ART TO THE PUBLIC,*

*WE WANT NEW ART AND A NEW AUDIENCE…*

*…WE WANT TO PROPAGATE CONTINUOUS REVOLUTION IN A WORLD FULL OF SO-CALLED CERTAINTIES, AND WITH THESE CERTAINTIES, WE WANT TO BREAK.*

*IT IS THE ART TO PREVENT THE INSTITUTIONAL AND THE CERTAIN. QUANTUM THEORY AND RELATIVITY THEORY HAVE MADE IT CLEAR TO US THAT THE SENSIBLE REPRESENTATION OF OUR EXPERIENCE ONLY APPLIES TO A LIMITED AREA. AND THAT THIS DOES NOT BELONG TO AN UNDENIABLE STATEMENT OF SCIENCE IN ANY CASE…*

*…WE MUST SHAPE THE NEW, ASSUMING THAT NEW FORMS CAN ONLY ARISE FROM NEW CONTENT AND NOT VICE VERSA. CREATING NEW ART MEANS MAKING NEW CONTENT VISIBLE, TANGIBLE, AND AUDIBLE.*

*ART MUST BE FUNCTIONAL. WE SEE ART AS A FORMATIVE PRINCIPLE IN SOCIETY. ART MUST UTILISE THE MATERIALS, MEDIA, AND POSSIBILITIES OF ITS TIME TO DETERMINE THE IDEAL FORM.*

*SCIENCE AND ART MUST BE A REVOLUTIONARY FORCE WITHIN SOCIETY AND NOT AN EMBELLISHMENT OF A MISERABLE EXISTENCE OR AN ECONOMIC FACTOR.*

*ART MUST BE DESTRUCTIVE AND CONSTRUCTIVE.*

*ART, SCIENCE, OR ANY MEDIUM IS NOT AN END IN ITSELF BUT A MEANS TO REALISE A FORMING IDEA. IT SHOULD NOT FORM AUTONOMY WITHIN OUR SOCIAL ORDER BUT BE PART OF IT. NOT TO AFFIRM THE PREVAILING MORALITY AND POLITICS, BUT TO PROPAGATE CHANGE. ART SHOULD NOT TAKE PLACE IN THE AUTONOMOUS WORLD OF GALLERIES AND MUSEUMS BECAUSE THEY ACTIVELY OPPOSE CHANGE; THE ART TRADE BENEFITS FROM IT AND IS NOT INTERESTED IN CHANGES. THEY WANT THE END PRODUCT AND NOT THE JOURNEY. THEY ASSUME THE ABSENCE OF THE URGE TO OVERTHROW THE RESULT. THEIR MOTIVES ARE PROVIDED BY THE SOCIAL CODE IN WHICH ART KNOWLEDGE HAS BECOME POWER AND THEREBY INFLUENCE AND PRESTIGE”*

This and the illustrations in this chapter show how digital practice follows the avantgarde principles of rejection of art institutions, questioning the autonomy of art, and challenging of the status quo.

### Illustration: Rafael Rozendal – The internet as canvas

Rafaël Rozendaal (1980-) is a Dutch-Brazilian artist considered one of the pioneers of internet art. We illustrate how Rafaël Rozendaal's exploration of the internet as a canvas serves as a poignant illustration of the transformative shifts mentioned in the chapter.

In several of his talks, e.g. (Rozendaal 2014) and (Rozendal 2013), Rafael Rozendaal emphasises that the internet is his canvas. This implies that his artworks are embedded on the internet and, as such, are affected by the type of PC, screen size, colour settings, and the user.

*“I just saw the Internet as a young child and then later in art school and I thought I can speak directly to my audience and that's absolutely amazing and so I decided not to treat the Internet as a portfolio but as a place for art so I didn't want to make sculptures and put pictures online and I said no the browser is my canvas and I'm going to treat it with respect.”* (Rozendaal 2014)

Here, he embraces the idea that the aesthetic object is no longer focused exclusively on the art object itself but on its process, system, and context.

For example, in his work [https://www.intotime.us/,](https://www.intotime.us/) he wants to explore ways to divide the screen, but since it is an internet-based work, he needs to define a set of generic rules, and then it is to the user to create the work by clicking on the screen. In other words, he reformulates the roles of the maker and the viewer of a work of art. Here is his description of the work:

*“…Here's another example just really simple rules you start with the screen. We all know the screen, and what's unique about the web is that each screen is different, so you have to think about composition in a different way because painters are used to I'll make a black, I'll make a square painting, I'll make a portrait or landscape, but on the internet, you don't know so the screen might be someone could look at it on their phone. It's like this: you start with some colour, and then you set a point, and the screen is divided into four sections, and you set another point, and so on. It's a dialogue between you and me because I'm making a set of rules, and you can play within those rules. So it has always been about the presence of the user and the influence of the user on the image and then the ground idea I'm very interested…”* (Rozendaal 2014)

He points out that it is crucial for his work to be part of the praxis of our everyday internet experience. *“…we're used to being on the internet. We see the work and forget about the device, but when we go to the exhibition space, suddenly, a computer is an object. You're no longer in that dream area when you're at home, and you forget about where you are.”* (Rozendaal 2014)

In other words, he challenges the added value of art institutions for the artwork. His digital artworks, accessible to anyone with an internet connection, challenge the traditional notions of art consumption, distribution, and ownership. The internet becomes both the medium and the exhibition space, democratising access to art in ways inconceivable within the confines of the traditional art institution.

# Originality in the digital age

One of the practical and conceptual challenges digital creative practice has brought into the picture is that of originality or reproducibility.

In digital art, replicability is not a flaw but a feature. Internet pioneer Steward Brand captured it under the slogan *“Information wants to be free”*.

From a purely practical perspective, this raises the following challenge:

*"If our (digital) property can be infinitely reproduced and instantaneously distributed across the planet "without" cost, how are we going to protect it? How are we going to get paid for the work we make with our minds, and if we can't get paid, what will assure the continued creation and distribution of such work?"* (Tehranian 2021)

In the realm of creativity, this goes even deeper. A digital copy of a digital asset (art piece) is, objectively, the same as the original one. This goes against the tradition of giving more value to the original because if the original is the same as the copy, what is the “artistic value” of the original piece?

Even more, if the new digital aesthetic is about flows of information, what does “information wants to be free” imply for the digital practice?

## Originality as a myth of traditional art

Already in 1935, Walter Benjamin (Benjamin 1969) was philosophising about how machines would influence creative practice.

He introduces the concept of the "aura" associated with unique, original artworks. The aura is the sense of authenticity, originality, and authority that is felt when in the presence of a one-of-a-kind piece of art. He then argues that mechanical reproduction diminishes the aura of an artwork. Copies lack the spatial and temporal context of the original, leading to a loss of the unique experience associated with the authentic work of art. In his words:

*“Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be”* (Benjamin 1969, p3)

In other words, the historical context of an original piece cannot be replaced by even the most perfect reproductions of it. Jack Burham reacts to this perspective as follows:

*“One hypothetical issue in esthetics is the seemingly trivial question of whether undetected art forgeries have historical validity. Usually the answer is that they do not, and the reasons most often invoked have to do with stylistic consistency or the utter uniqueness of the artist imitated. But regarded in the context of important records which have been destroyed and replaced with copies, the real reason becomes evident. We accept copies but feel no compulsion to venerate them. A known false work of art cannot mediate between past and present, the diachrony of history and the synchrony of mythic event. Belief in the physical authenticity of the work of art is absolutely essential to myth, since the object is the trans- substantiated energy and psyche of the artist it survives. Hence totemism in art not only moves laterally in terms of linking contemporary art forms, but also vertically with relation to past and future events.*” (Burham 1973, p14)

Since digital art comes from a different tradition than fine arts, the problem of replicability is more an issue of fine arts than digital art. It becomes a problem for digital art when it tries to force itself into the historical tradition of the art practice.

*“Fundamental to the mythic form of art history is the practice whereby all objects are regarded as completely unique. Works of art may neither be divided nor multiplied, although they may relate to other works serially or cyclically.”* (Burham 1973, p40)

Since in digital art, reproducibility is not a fault but a feature, any tradition that grows up from here ought to embrace this. The “aura” of a digital artwork is not on its presence in time and space relative to traditional arts. At best, it would be for its position in the tradition of digital art.

## From the web 1.0 to NFT’s

In less than 30 years, the Internet and the World Wide Web, or the Web, have transformed how we interact with media.

In its first iteration, Web 1.0 focused on messaging and static web pages. From this perspective, web 1.0 could be seen as "old" media on the side of books, news, and Television. One of the key characteristics of that "old" media is that there are few creators of information, and most users are information consumers. Because of this, the creators of information have a lot of control over the information made available and when it is made available to consumers.

This changed with the development of Web 2.0. Here, it was/is all about reading, writing, and creating content by users themselves. Web 2.0 made the development of social platforms possible. These platforms got big because the content created came from all their users. In this sense, Web 2.0 was the birth of new media.

One of the crucial switches of Web 2.0 relative to Web 1.0 was that the end user is not only the user but also the participant of the information. In addition to this, the availability of information has moved towards an on-demand model.

These developments have led us to a situation where the web mediates most interactions. These include interactions with ourselves (e.g., agendas), others (e.g., messages), knowledge (e.g., Wikipedia), and information in general.

Rafael Rozendaal's work, as discussed above, takes place in Web 2.0.

The next iteration of the web, Web 3.0, is happening right now. It is based on blockchain technology. In addition to the reading and writing capabilities of Web 2.0, it brings ownership and decentralisation as digital natives in its conception.

### Non-Fungible-Tokens

A key technical feature of Web 3.0 was the introduction of Non-Fungible-Tokens (NFTs)[[13]](#footnote-13). NFTs were first promoted as the solution that would allow artists to be free from the middle parties dominating the art market. Artists would have full ownership of their digital assets.

This ideal was well aligned with the avantgarde principles of rejecting art institutionalisation.

The process of creating, or making available, an NFT is known as "minting". This involves uploading the digital asset, providing details about the work, setting any additional parameters (e.g., edition size), and defining the smart contract.

NFTs had a boom in 2021 and stormed into the art world. On the commercial aspect, some NFTs sold for over $69 million[[14]](#footnote-14). Even Sotheby’s launched the “Sotheby’s Metaverse” branch to address the newcomers. However, as for today, the hype has calmed down. The NFT markets have slowed down, and the values of NFTs dropped. Nowadays, the trade of NFTs is “regulated” by marketplaces like <https://opensea.io/> or <https://superrare.com/>.

With the market's over-saturation, it is impossible for upcoming artists to be noticed without the help of networks and some intermediary to promote their art. We are back at the starting point where some autonomous institutions regulate the art market.

Notice that the process of “minting” requires the precise definition of the object to be made available. The immutability of the blockchain implies that what is decided at this point can never be changed again. That is, minting promotes the creation of static, finished art objects.

Theoretically, any digital assets can be minted, i.e. become an NFT. However, we see that most of the items available in the NFT’s art markets are images, gifs, and videos . In other words, most of the items available in the NFT’s art markets are digital mimesis of physical counterparts. Namely, traditional aesthetic objects in digital form. They do not embrace the characteristics of digital aesthetic objects like dynamicity or cybernetic perspective, as we discussed in the previous chapters.

Artists could mint other objects instead of the “final product”, for example, the script with the code or the complete application needed for the digital artwork to run. However, this does not happen, primarily due to the market demands. The NFT’s audience asks for digital representations of traditional physical art objects. This brings us back to the 1986 Unstable Media Manifesto, which asks for a new art form and a new audience.

A question that remains unanswered for NFTs to integrate into the digital art practice is: *What is the right thing to mint?*

Notice that Rafael Rozendaal, before NFTs, offered the domain of his artworks for sale. Since the artwork is the website itself, and domains are unique, he had already solved the issue of originality and replicability for his artworks without NFTs.

## Illustration, CryptoPunks and Bored Ape

Let’s look at two examples of NFTs that draw a lot of attention. Those are CryptoPunks and Bored Ape Yacht Club.

### The art objects.

*“CryptoPunks are a set of 10,000 unique digital collectable characters stored on the Ethereum blockchain. Each item in the collection is a 24x24 pixel, 8-bit-style portrait with a unique set of attributes and traits.*

*CryptoPunks was one of the first non-fungible token projects and has since paved the way for other successful NFT collections such as CryptoKitties, Bored Ape Yacht Club and CrypToadz.”* (kraken.com 2022)

CryptoPunks were launched in 2017, before the NFT boom of 2021, and were initially free. Seven CryptoPunks[[15]](#footnote-15) are listed in the “Top 20 Most Expensive Sales of All the Time” (Langston 2023)

*“Bored Ape Yacht Club is a collection of 10,000 non-fungible tokens on the Ethereum blockchain. Each NFT in the collection depicts an Ape with an algorithmically generated set of traits, including different eyes, facial expressions, hair colours and accessories.”* (kraken.com 2022)

The Bored Ape collection was one of the most iconic collections in the 2021 NFT boom. These came in the news and were the topic of several lunch discussions. They reached their top on Bored Ape 8817, which sold for 3.4 million dollars in an auction facilitated by Sotheby’s. The same action was the public launch of Sotheby’s Metaverse branch. (GMTA Software Solutions Pvt Ltd 2023)

### Review of the art objects.

These two examples are illustrations of digital art objects that do not follow the full potential of digital art practice and try to put digital assets back into the traditional establishment of art institutions.

To begin with, both collections restrict the number of items to 10.000 items, whereas the possibilities are much higher.

For example, CryptoPunks can have seven attributes with over 100 possibilities each. The total number of combinations is larger than the current world population. Bored Ape is in the same order of magnitude.

That means that the collections have explored less than 0.00000001% of possibilities. This is opposite to the principles we saw in the work of Vera Molnar. In fact, as only 10.000 were minted, CryptoPunks and Bored Ape have become static objects at the same level of a painting. That is, they go against the dynamic perception of digital aesthetic objects.

Both collections use elements of randomness, but not in the way we saw with Vera Molnar as an aid to the creative process to create a conversation between the artist, the machine and the viewer. It is more like the viewer's interaction when buying a lottery ticket.

Let's recall Claudia Gianneti's perspective on digital aesthetic objects as an exchange of information. That cannot be seen in any of the items of the collection or the collection itself. The user, or viewer, does not influence the art object. In that sense, a CryptoPunk or Bored Ape is a static object dissociated from the viewer. In that sense, they can only acquire “value” based on the tradition behind it, just like a Rembrandt or a Van Gogh.

In conclusion, CryptoPunks and Bored Ape are examples of digital art practices that are cloning traditional art establishments into the digital world.

## Illustration: Life forms

Let’s look at another NFT example more aligned with the principles discussed in this thesis. It is Life forms.

Life forms can be found at <https://lifeforms.supply>. Here is the description there:

*“Lifeforms are NFT-based entities. Like any living thing, lifeforms need regular care in order to thrive. If not properly looked after, lifeforms die.*

*A lifeform that has died will no longer appear in wallets, is not transferable, and cannot be brought back to life in any way. How do you care for a lifeform?*

*Within 90 days of receiving it, you must give it away.”*

These are dynamic objects that will keep changing until they die. This concept is interesting as art objects are not usually perceived as living entities.

In addition, these artworks make great use of technology and embrace their possibilities. Imposing the condition that the artwork must be given away within 90 days, or it dies, embraces the possibilities of the blockchain and involves the viewers/owners with the artwork. The immutability capabilities of the blockchain and smart contracts make this work impossible before NFTs.

## Summary

We discussed how the problem of originality incarnates into digital objects. We concluded that the “problem” is not a “problem” of digital art practice but a problem of traditional art institutions and the establishment that romanticises the notion of the singular, irreplicable masterpiece, elevating originality to mythical proportions. It becomes a problem for digital art when it tries to force itself into the historical tradition of the art practice.

Digital art tradition ought to embrace reproducibility. The “aura” of a digital artwork is not on its presence in time and space relative to traditional arts. At best, it would be for its position in the tradition of digital art.

The promise of NFTs to save the art world by removing the middleman and empowering artists to make a living is still to see its realisation. In fact, after the NFT boom of 2021, the market is no longer as profitable and has either returned to traditional establishments and institutions or has become a niche for enthusiasts.

Finally, how most NFTs are produced and consumed today mimics their physical counterparts and does not embrace their digitality and the full potential of digital art and NFTs. The question to answer here is: *What is the right thing to mint?*

# Conclusion: Towards a Digital Avantgarde

This thesis began with a personal exploration, seeking to harmonize my engagement with unstable media and interactive practices with the more conventional realm of "Expanded Painting" encountered at the Rietveld academy. Delving into avantgarde art theories and examining the aesthetics of digital art through a cybernetic lens set the stage for contextualizing the nuances that rendered my practice seemingly incongruent within the framework of "Expanded Painting."

In short, aesthetic theories rooted in cybernetic thinking embraced the dynamism, instability, and transformative potential of the digital art object, challenging the established norms of a historical art continuum where the art object is static, stable, and placed “above” the viewer.

In the pursuit of reconciling these divergent ideologies, it became evident that the core tenets of avantgarde movements, such as questioning artistic autonomy, rejecting institutional norms, challenging the status quo, and redefining art's role in everyday life, resonated strongly within the fabric of digital art practice.

The thesis also highlighted the pitfalls encountered by digital art when attempting to replicate traditional paradigms, emphasizing that these challenges arise precisely from the attempt to digitize physical art objects rather than embracing their inherent digital nature. Institutions like the Rietveld and DogTime, by resisting the assimilation of digital practices, perpetuate a divergence between art theory and digital art practice rather than fostering convergence.

Drawing inspiration from Carl Sagan's wisdom, the thesis reframes his words, suggesting that in a society reliant on science and technology, a lack of understanding in these domains is a perilous path that will herald the end of art[[16]](#footnote-16).

Yet, amid this divergence, there are beacons of convergence emerging within the Netherlands. Organizations like V2\_, Creative Coding Utrecht, Acid Soldier Club, and the Waag embody the spirit of the Digital Avantgarde, actively bridging the gap between digital art practice and established art institutions.

In conclusion, the Digital Avantgarde emerges as the contemporary movement, seeking to establish the autonomy of digital art practice on its own terms, free from constant comparison to traditional counterparts. It echoes the sentiments of the V2\_ 1986 Unstable Media Manifesto:

"WE DO NOT WANT TO BRING EXISTING ART TO THE PUBLIC,

WE WANT NEW ART AND A NEW AUDIENCE."

The Digital Avantgarde, in its quest for innovation and independence, charts a new trajectory for the evolving landscape of artistic expression in the digital age.

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1. I will base my definition of media art in the V2 Unstable Media Manifestos. This line is rephrasing part of the manifesto version of 1987. [↑](#footnote-ref-1)
2. I define fine arts as “art objects” that are static and do not change with the viewer. As we will later see, those are essential characteristics to unstable media and computer art. [↑](#footnote-ref-2)
3. I take video that is used to document, illustrate, depict something, as fine arts. More generally a video that is just set up in a loop repeating the same images is just a digitalization of the frame used to display pictures. As far as the video is a static object and does not embrace or mutates with the spectator it is to me just a collection of static images hence in the same level of painting, illustration, or photography. [↑](#footnote-ref-3)
4. For this perspective the Wikipedia definition is accurate yet needs to be concrete enough as it does not explain why avantgarde movements are innovative. [↑](#footnote-ref-4)
5. translation by chatGPT [↑](#footnote-ref-5)
6. *“Tableau is used to describe a painting or photograph in which characters are arranged for picturesque or dramatic effect and appear absorbed and completely unaware of the existence of the viewer”* (TATE sd) [↑](#footnote-ref-6)
7. Perhaps there were other female artists exposing at her time, but the important point is that the art world was even more male dominated that what it is now. Something that has not improved much as is shown by the work of the Guerrilla Girls; women are still fighting for their place in the art society, and many have become an artistic PR icon [guerrilla girls] for the institutions to show “diversity”. [↑](#footnote-ref-7)
8. The core of plot of the first film is that a Ghost with no Shell was born on the “sea of information”. In the film it is called the Puppet Master or Project 2501. In the film, Project 2501 is a sentient being with enough consciousness to communicate with humans, seek political asylum, and aim for evolution to transcend its existence. [↑](#footnote-ref-8)
9. The idea of corporations ruling the world has been present in the Cyberpunk literature since its beginning. However, reality has shown that governmental organizations and policies lag behind technological developments. [↑](#footnote-ref-9)
10. In the software development industry, software is developed by teams. In fact, contemporary software development methodologies (Agile) foster the success and results as a team achievement over individual achievements. [↑](#footnote-ref-10)
11. Some may contest whether Vera Molnar is really one of the pioneers of computer art but since I do not want to encourage the male dominated culture on art and its institutions, I will Illustrate the thinking behind computer art with her work. [↑](#footnote-ref-11)
12. This in contrast to the 1987 Unstable Media Manifesto by V2\_ used in section (V2\_ 1987) where we see a focus on defining what unstable media is and not its relation to art institutions or as a reaction to the status quo. [↑](#footnote-ref-12)
13. A non-fungible token (NFT) is a unique digital identifier that cannot be copied, substituted, or subdivided, that is recorded in a blockchain, and that is used to certify authenticity and ownership. The ownership of an NFT is recorded in the blockchain and can be transferred by the owner, allowing NFTs to be sold and traded. NFTs can be created by anybody and require few or no coding skills to create. NFTs typically contain references to digital files such as photos, videos, and audio. Because NFTs are uniquely identifiable assets, they differ from cryptocurrencies, which are fungible.

    [↑](#footnote-ref-13)
14. This is remarkable to compare with famous artworks like the Sun Flowers of Van Gogh, is valued at around $100 million. [↑](#footnote-ref-14)
15. Those are: #8857, #7804, #3100, #5577, #4156, #7523, and #5822 [↑](#footnote-ref-15)
16. The original quote is: *“We live in a society absolutely dependent on science and technology and yet have cleverly arranged things so that almost no one understands science and technology. That's a clear prescription for disaster.”* [↑](#footnote-ref-16)