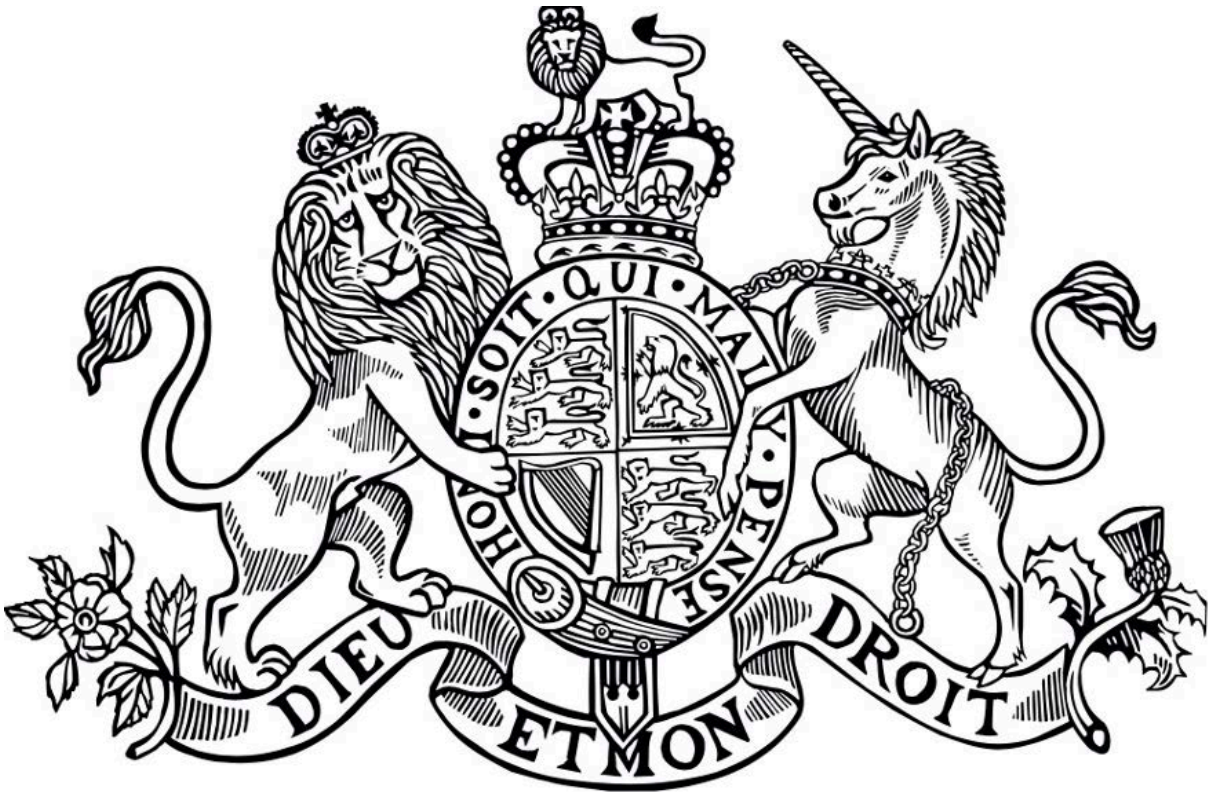

Painting Practice as Network:
The interoperability of contemporary painting

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Declaration

This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis. During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now Submitted.

Seungjo Jeong
30 June 2025

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Abstract

Painting Practice as Network:
The interoperability of contemporary painting

This practice-based research re-articulates the correlation between a physical painting and its on-screen image in the context of today's post-internet painting practice. Since its inception, the term 'post-Internet art' (Olson, 2008) has been defined in various ways (Connor, 2015; Kholeif, 2020) in response to the developing relationship between contemporary art practice and the digital network. Despite the 'opacity' of the current online environment, in which the context of user-created content is manipulated by social media (Lanier, 2018), paintings are presented and circulated through the online platforms in the form of images, which 'act and catalyze actions' (Steyerl, 2021) regardless of the painter's intention for the works.

I use my painting practice as the central method of this research. I make paintings in the studio and examine both the outcomes and the processes involved. I also re-examine the processes through the lens of 'computational thinking' (Wing, 2010) by translating them into a procedural programming language. I use my solo exhibition to lead and evidence the development of an online proxy for a painting in a real-life setting.

The proxy offers the painter a way of building the context of their own work online. To utilise the internet as the 'ground' of painting through which to exploit the 'image power […] derived from networks' (Joselit, 2013), I refer to Berners-Lee's (1994) idea of the 'Semantic Web', which is a combination of 'machine-readable Web content' and 'automated services'. I adopt metadata schemas, which are, importantly, readable and writable by both humans and machines, as a 'common language' and 'proper standard' (Haraway, 1991) to construct a 'joint' that can 'accommodate and manage heterogeneous elements' in a network (Galloway, 2021). The joint, consisting of a painting's metadata, not only contextualises the painting's online content available in various formats but also interconnects these into a network,

which serves as the work's online proxy. Working closely with search engines, the proxy enables the interoperability of painting for both the painter and the viewer.

I redefine the painting-canvas as *a sensuous interface* by which the painter can realise the 'rhythmic unity of the senses' (Deleuze, 2003). Informed by Galloway's (2008) idea of interface as 'translation', I utilise the interface to reinterpret the ground of painting through the lens of the painting's subject matter. Together, the paintings made as part of the research offer multiple viewpoints on the correlation between the material ground (the canvas) and the immaterial ground, such as the digital screen and the internet.

Combining both Ash's (2015) notion of the interface and Latour's (2011) notion of the network I construct a conceptual framework – an 'interface for the network of painting practice', through which the painter can remap their painting practice as a 'distributed network' (Joselit, 2013). Using Galloway's (2021) idea of 'holes' in the network, they can 'embrace the chaos' (Deleuze, 2003) of newly discovered and unpredictable outcomes of the painting process.

Glossary

Access privileges: The right or permission to access certain material. In computer security, these define the level of access granted to a system and determine what features or capacities are available to each user.

In the research, I adopt this term to highlight that the painting-canvas has different types of user. Every user, whether this is the painter, viewer, curator, collector, critic, photographer, dealer, art handler or someone else, is granted a different level of access to the painting-canvas. For example, the painter can make, touch, change, view, move, pack and show the canvas, whereas the viewer is only allowed to see it as a finished painting.

Automated services: Software agents that can process 'machine-readable Web content' for users (Berners-Lee, Hendler & Lassila, 2001, p.42). They are a key component of the Semantic Web. Search engines, such as Google, are examples.

This research considers the key role that search engines have in building the online context of a painting. Since automated services need to be informed about the painting and its relationship with the online presence of the work in order to carry out the task, the research suggests organising the required information into a metadata schema, a machine-readable format for data exchange. This information, which the research calls a 'joint', can be communicated to search engines by being published online. By retrieving and processing the information in an automated way, search engines can better understand the painting and its online context in order to offer users who undertake an online search for the painting the most relevant online content and information.

Common language: A language that is widely understood and used by a group of people who speak different native languages.

The research refers to the scholar Donna Haraway's remark that 'any component can be interfaced with any other if the proper standard, the proper code, can be

constructed for processing signals in a common language' (Haraway, 1991, p.163). I propose a metadata schema, a web standard for data exchange that is readable and writable by both humans and computers, as a 'common language' for sharing extensive and nuanced information about a painting with a global online audience.

Computational photography: Techniques to capture and process images by using computation to enhance, extend or simulate the capacities of traditional photography.

These are widely used in recent smartphones and standalone digital cameras.

This research refers to the artist Hito Steyerl's (2014) perspective on computational photography in terms of how the computer algorithm generates a digital photograph by networking resources and exploiting noise.

Computational thinking: 'The thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent' (Wing, 2010, p.1).

A divide-and-conquer algorithm is a well-known example of computational thinking.

I have adopted this problem-solving approach to reconsider my painting practice from a digital perspective. It is divided into three groups of processes: before painting (*measuring*, *cutting*, *stretching*, *priming*), during painting (*hanging*, *drawing*, *painting*) and after painting (*storing*, *restretching*, *exhibiting*) and then translated into Visual Basic, a procedural programming language.

Diagram: In this research I refer to Gilles Deleuze's notion of the diagram. In the context of painting, the philosopher describes it as follows: 'The diagram is [...] the operative set of asignifying and nonrepresentative lines and zones, line-strokes and color-patches' (Deleuze, 2003, p.101). Deleuze asserts that 'The diagram is indeed a chaos, a catastrophe, but it is also a germ of order or rhythm', so it is the responsibility of the individual painter to identify the ways in which they can find a 'manner of embracing this [...] chaos' (ibid., pp.102-103).

I consider Deleuze's diagram as a framework to understand the correlation between the painter's action and a happy accident, in the sense that the diagram concerns 'an action, not a thing but a moment, a moment of transformation' (Sillman, 2020, p.131). The diagram also echoes Latour's notion of the network, which 'points to a transformation in the way action is located and allocated' (Latour, 2011a, p.798).

Distributed network: A type of network in which one 'cannot disable the entire system by disabling individual nodes since there are many others available to take over their functions' (Joselit, 2013, p.19). Joselit asserts that, like the internet, 'the art world is [also] equipped with a sophisticated distribution network' (ibid., p.89).

Informed by its structural benefit of 'a robustness that derives from redundancy' (ibid., pp.18-19), an online proxy for a painting has been conceived in this research in the form of a loosely connected network of the painting's digital content that exists in various formats available across the internet.

By taking the form of a distributed network, the proxy can operate and represent the painting online while protecting itself against sudden changes to its components. Similarly, the proxy enables its creator (the painter) to freely change its components as required without interrupting the network or rebuilding it entirely from scratch.

Edge: In painting, this is the boundary, or transition, between different colours, shapes and textures.

This research discusses two types of edge. My paintings feature hard-edged shapes, which means that the transition between the painted (or unpainted) areas on the canvas and the outlines of the shapes are sharp and clearly defined.

The research also considers ways of using the edges of a stretched canvas, the physical boundaries of the picture frame, as a vocabulary for painting.

Gesso: A primer that is used to coat surfaces such as canvas, wooden panels and paper to prepare them for painting.

Gesso is applied to the surface, usually with a brush, to create a physical layer that not only protects the surface from absorbing paint but also helps it to hold paint.

In this research, acrylic transparent gesso is used to prime the stretched linen canvas so that the gesso layer reveals the woven texture of linen on the canvas.

Ground: In painting, the layer onto which paint is applied.

While there are various types of grounds that are made and used for painting, this research mainly deals with the ground I normally use for my paintings, a stretched linen canvas. To prepare the ground, I first assemble wooden stretcher bars into a rectangular frame and then stretch linen cloth over the frame in a way that creates the tautness and resilience of the ground. I then prime the stretched canvas by applying gesso to its surface, not only to protect the underlying cloth but to create a surface that provides ‘tooth’ for holding paint on the ground.

In the research I develop a way to utilise the internet as the ground for painting, which is informed by David Joselit’s suggestion of a network as the ‘ground’ of artworks (Joselit, 2013, p.94). In terms of holding and presenting a painted image, the internet has different characteristics from the canvas. Joselit warns that ‘when it enters into networks, the body of painting is submitted to infinite dislocations, fragmentations, and degradations’ (Joselit, 2009, p.134). To propose the internet as a ground for painting, I address these problematic aspects by creating an online proxy for a painting. The proxy functions like gesso applied to the canvas, giving the digital network ‘tooth’, in the sense that it sustains the online version of a painting by locating and selecting online images of the painting that are scattered across the internet and connecting them in the form of a distributed network of the curated online content via search engines. Because it is a flexible structure, the proxy can be reconfigured with different content at any time. Unlike the canvas, on which painted layers are irrevocably amalgamated, the proxy enables the internet to function as the ground of painting by hosting a shifting image of a particular painting.

GUI: Graphical User Interface. This is ‘a computer program that enables a person to communicate with a computer through the use of symbols, visual metaphors, and pointing devices’ (Levy, 2018).

The GUI ‘has been the dominant interface [...], and its aesthetic of transparency has shaped most interface design’ (Bolter & Gromala, 2006, p.377). It ‘is supposed to be intuitive, easy to use, and consistent’ (ibid., p.376).

Building on this idea, I consider the painting-canvas as a user interface that is intended to be ‘intuitive, easy to use, and consistent’ (ibid.) for its user, the painter. In addition, I examine the spatial and functional relationship that exists between painted layers and the canvas by comparing it with the relationship between GUIs and the screen.

Happy accident: In the research, this refers to an unexpected but potentially favourable outcome that occurs while painting takes place.

The happy accident is a matter of perspective, in the sense that it may or may not happen on the ground of painting, depending on the painter’s ‘evaluation of the pictorial order to come’ (Deleuze, 2003, p.103). Considering its subjective nature, this research examines the happy accident using Latour’s notion of the network, because it is ‘good at describing long-distance and unexpected connections starting from local points’ (Latour, 2011b).

Holes: An empty space in a network.

In terms of structure, ‘networks define nodes and edges, but they do not define the holes in the net, the gaps that let things pass while others are ensnared’ (Galloway, 2021, p.237).

Considering painting as a network, in the research I discuss how to deal with undefined areas of the network, such as its holes. To do this, I refer to the social scientist Ronald S. Burt’s description of ‘structural holes’: ‘good ideas are

disproportionately in the hands of people whose networks span structural holes' (Burt, 2004, p.349).

Integrated Development Environment (IDE): A software application that helps software engineers to write computer code effectively.

It provides comprehensive tools and facilities for software development.

Based on my previous experience of using an IDE, Visual Studio 6.0, which featured a well-designed user interface (UI), in the research I consider the painting-canvas as a user interface that is purpose built for painting.

Internet protocol (IP): A fundamental set of rules for online communication, i.e., sending and receiving digital information via the internet.

In this research, IP is considered as an underlying framework that facilitates the operation of an online proxy for a painting.

Interoperability: The capability of computer systems or programs to exchange data for them to work together with little or no interruption.

There are different types of interoperability, such as technical, syntactic and semantic. Technical interoperability means the capability of computer systems, in terms of applications and infrastructures, to communicate and exchange data with each other. Syntactic interoperability means the capability of systems to share data in a standard format and protocol. Semantic interoperability means the capability of systems to exchange not only data but also the meaning of the data.

This research suggests implementing both syntactic and semantic interoperability between a painting and the digital content associated with the painting, available in various formats across the internet, by using a metadata schema, a web standard for sharing structured data, in order to improve the interoperability between a physical painting and its digital presence.

Joint: A device that is designed and made to connect things together.

The mathematician Lewis Richardson suggests that ‘joints’ can be built to ‘accommodate and manage heterogeneous elements’ (Galloway, 2021, p.130). Based on this idea, in the research I suggest creating a joint that connects a physical painting with its associated digital content, available in various media formats across the internet, as a way to manage their coexistence. By doing this with a selection of online content, an online proxy for a painting can be built in the form of a network of the curated content, which represents the painting online.

The joint of the proxy takes the form of a metadata schema, a web standard for data exchange, which is, notably, readable and writable by both humans and machines. This both helps to easily organise information about a painting and provides the information to search engines so that they can better understand the relationship between the painting and its online content based on the information provided.

JPEG: Joint Photographic Experts Group (JPEG) is the name of the committee that defined the standard: the acronym is commonly used to refer to image compression enabled by sacrificing image quality. JPEG also refers to a file format that is popularly used for storing digital images.

Machine-readable Web content: This is Web content that is made machine readable in a way that online software agents, called ‘automated services’ in the Semantic Web, can understand (Berners-Lee, Hendler & Lassila, 2001, p.42).

In the research I address concerns that when the digital version of a painting is circulated online, it often lacks its proper context as an artwork. I therefore suggest working with search engines, ‘automated services’, to (re-)establish the context of the work. This involves organising the necessary information about the painting and its relationship with its online content and providing search engines with this information. When the information is published in a machine-readable format online, which I call building a ‘joint’ between the painting and its online content, search engines can then retrieve and process the information in an automated way. By

doing so, search engines can understand the painting better and can offer their users the most relevant online content and information related to the painting.

Masking tape: Adhesive tape made of paper, that is pressure-sensitive and easy to tear.

Due to its low-tack adhesive (ensuring clean removal), the tape does not damage the surfaces it adheres to. It is widely used in painting to preserve unpainted areas of the painting surface or to create shapes with sharp edges on the ground.

In this research I consider it as a component of the interface that I create with other painting materials and tools for making a painting.

Metadata: ‘A statement about a potentially informative object’ (Pomerantz, 2015, p.26).

The research suggests that the metadata associated with a painting can be organised and used to contextualise the work’s online presence via search engines. To use the metadata for this purpose, it needs to be assembled in a standard format for data exchange, which is known as a metadata schema.

Metadata schema: ‘A set of rules about what sorts of subject-predicate-object statements may be made about a resource’ (Pomerantz, 2015, p.211).

A metadata schema is a web standard, meaning that it has been implemented and used on the internet as it is today. It encompasses descriptive, administrative, structural, preservation and use metadata (ibid., pp.17-18). Importantly, it can be readable and written by both humans and machines. There are several versions of metadata schemas that are free to use.

Based on these characteristics, in the research I suggest a metadata schema as a common language that can be used to assemble the extensive information about a painting and its relationship with its online content, and communicate this information

to search engines, which present the painting to online audiences in a way that is based on the information provided by the painter.

Module: In computer programming, a unit of code that is written to perform a specific function.

It needs to be written in a standardised manner for practical reasons, such as enhancing the reusability of the code and for ease of maintenance.

I examine my painting practice from a digital perspective by translating the practice into a procedural programming language. To distinguish and focus on each process of the practice, I divide the practice into individual processes, such as priming, stretching, drawing and painting, and I interpret each process as a module.

In addition, in paintings such as *Anderson* (2021) and *Interface Shipping* (2021), I treat the canvas as a module in the sense that it is easily modifiable, replaceable and duplicable, like a digital layer in Photoshop.

Network: A group of interconnected elements.

The network theory scholar Bruno Latour describes how, in a network, ‘action is to be redistributed’ (Latour, 2011a, p.797), and the network ‘is fully dependent on its material condition’ (ibid., p.802). The notion of the network is ‘good at describing long-distance and unexpected connections starting from local points’ (Latour, 2011b). This notion can be applied to the tracing of a non-linear and unexpected development in painting, such as a happy accident.

Networks have the structural benefit of ‘flexibility’, which means ‘the ability to reconfigure according to changing environments and retain their goals while changing their components’ (Castells, 2009, p.23). Based on this idea, I have also created an online proxy of a painting in the form of a network of online content available across the internet.

Programming Interface: An Application Programming Interface (API) is a set of protocols that facilitate communication and access between computer programmes.

The artist and programmer Florian Cramer compares the term ‘programming interface’ with the term ‘user interface’, and by doing so distinguishes programmers from users ‘based on different access privileges to machine functions granted by the respective interface’ (Cramer, 2011, p.120).

In the research I adopt this term to reflect the painter’s extended range of roles in relation to the painting-canvas. While both the painter and the viewer are generally considered as its users, the painter has full access to it, whereas the viewer is usually given much more limited access to it, seeing it only as a finished painting.

Proxy: Something that represents something else by acting on its behalf.

This research suggests that an online proxy for a physical painting can be created to represent the painting online.

The proxy can be built by organising information about a painting and informing search engines about the relationship between the painting and the online content associated with the work. By doing so, search engines can better understand the painting based on the information provided and can offer their users the most relevant online content and information about the painting. In this sense, the proxy acts on behalf of the painter to communicate with those who are searching for the painting online.

The research concerns the ‘opacity’ of the current online environment, where the context of user-created content is misplaced or replaced by that of social media (Lanier, 2018, p.64). By creating a proxy with a curated selection of the online content associated with a painting, and working with search engines, the painter can build the online context of the painting while reducing their reliance on social media channels.

The proxy also acts like the ‘tooth’ of the canvas in the sense that it connects the online content relating to a painting that is available in various media formats scattered across different platforms and maintains the curated online content in the form of a network.

Screen: A surface located at the front of a computer monitor, smartphone or television on which images are displayed.

I compare the screen with the canvas in terms of the spatial and functional relationship of each with the respective images they host. A digital image is electronically and temporarily generated behind the screen, whereas a painted image is physically and irrevocably built on the canvas.

Semantic Web: ‘an extension of the current [web], in which information is given well-defined meaning, better enabling computers and people to work in cooperation’ (Berners-Lee, Hendler & Lassila, 2001, p.37) The Semantic Web consists of ‘machine-readable Web content’ and ‘automated services’ (ibid., p.42).

I use this as a technological framework to create an online proxy for a painting. The proxy can be made by organising information about the painting and the relationship with the online content of the work and publishing this information in a machine-readable format online. Search engines, ‘automated services’ (ibid.) such as Google, then automatically retrieve and process the information. With a better understanding of the painting, they can now offer users who are searching online for the painting the most relevant online content and information. In this way, the Semantic Web facilitates the operation of the proxy, which works closely with search engines to represent the painting online on behalf of the painter.

Sensuous interface: An interface that is linked to human physical feelings and that offers pleasure to human physical senses.

I consider the painting-canvas to be a sensuous interface for the painter, in the sense that it offers its user a multisensory experience of painting while physically interfacing with the painting support.

Social media: Online applications and platforms that facilitate communication between people, enabling users to create and share digital content.

This research focuses on Instagram, a popular social media platform for image-sharing, to examine how it shapes the distribution and the production of painting in relation to the fact that many contemporary painters use this online platform to present their art practice to online audiences.

Surface: In painting, this refers to both the support onto which paint is applied and the area that is painted on the ground.

I compare a painted surface in a physical painting with a graphical user interface (GUI) of a computer programme in terms of the viewer/user experience.

The painting-canvas: A physical object made of wooden stretcher bars and canvas as a painting support; a finished artwork (painting) created on that support.

I make and use the painting-canvas as a painting support. In this research, I consider it as a user interface for the painter to make a painting on in the sense that it is ‘made for interaction [...] adjusting to accommodate actual users and uses’, (Pold, 2005) like other interfaces. The physical aspects of the painting-canvas are components of the interface: its dimensions, weight, shape, colour and tactility, its static but live nature, and its stackability and dependency on light.

Tooth: The grain of canvas.

In painting, the tooth of the canvas plays a key role in holding paint on the surface of the ground. Applying gesso on the canvas gives the surface additional texture, ‘tooth’, which helps paint to adhere to the surface.

To use the internet as a ground for painting, the research examines what can serve as a digital counterpart of the tooth of the physical ground. Based on the idea that the fabric of the internet is woven with internet protocols, I suggest using a metadata

schema, a web standard for data exchange, as I would use gesso for a physical painting, to make the ‘tooth’ of the digital ground on which to build and operate an online proxy for a painting.

Transduction: ‘a process by which objects in interfaces are organized by designers to produce particular qualities for other objects in that interface and for the people using that interface’ (Ash, 2015, p.28) The term provides a useful lens through which to understand how the interface of objects works internally for the user of the interface.

In this research, I use the term to take a closer look at the physical process of painting that involves painting materials and tools in the studio.

User Interface (UI): In computing, this is the point of communication between users and machines. It is the means by which we interact with machines to achieve certain goals.

From this perspective, the research discusses a stretched canvas as a user interface that is purpose built to enable the painter to create a picture on it in their own way.

I consider the canvas as a sensuous interface that provides its user, the painter, with multiple sensations. In addition, following Galloway, who asserts that ‘an interface is not a thing’ but ‘always a process or a translation’ (Galloway, 2008, p.939), I use the canvas as a way of translating the subject matter of the painting into my language of painting.

Visual Basic: An ‘event-driven’ procedural computer programming language.

This is a programming language that I had previously used to develop GUIs (graphical user interfaces) in my work as a software engineer. I adopted Visual Basic in this research to examine my act of painting by dividing the painting process into a set of procedures from the perspective of computational thinking.

Window: An element of a graphical user interface (GUI).

A window is a viewing area on the computer screen that displays information and enables the user to interact with a computer programme.

In the research, from the perspective of the window's flexibility, in terms of its capacity to be resized, moved around (dragged) and overlapped with others on the screen, and its opacity, that disrupts an understanding of the computational logic behind this digital interface on the screen, I examine the spatial and functional relationship between painted layers and the canvas.

Introduction

0.1 Painter/Programmer

I am a painter with a background in software engineering. For me, as a painter, preparing the painting-canvas in different dimensions and with specific surface qualities for each painting is like developing a custom-made user interface for the painter. I also consider the painting-canvas to be a sensuous interface, because it is designed to facilitate the sensuous experience of painting for its user, the painter. In this way, this project directly addresses both the process of painting and that of programming.

0.2 Research questions

I have raised and investigated the following three questions throughout this research.

How can I re-articulate the act of painting from a digital perspective?
In the early stages of this research, my paintings explored the potential correlations between a painting and a digital interface. Reflecting on my painting process from the perspective of computational thinking, I began to examine how to present the physicality of painting in digital terms and language, and to extend my understanding of painting within this contemporary technological context.

How can my painting practice correlate positively with interfaces and networks in a post-COVID contemporary context?
During the global COVID-19 pandemic period, I was able to continue this research only by relying largely on digital interfaces and online networks. This question arose naturally in the light of my concern about the material sustainability of my physical practice.

How can the online context of a physical painting be built?
Paintings are disseminated increasingly through image-sharing social media platforms, with little indication or provision of their appropriate context as artworks provided. Considering that presenting paintings online is part of today's painting practice, I have developed this question to address the prevailing problem.

0.3 Research context

This practice-based research project takes a cross-disciplinary approach that combines ideas deriving from contemporary painting, information technology (the internet), computer science (computer programming and digital interfaces) and social science (network theory).

The current online landscape is characterised by the opaqueness[1] of the digital network that is created by the algorithmic manipulation of online platforms, notably including social media (Bridle, 2019; Lanier, 2018; Terranova, 2022). Building on previous discussions of 'post-internet art' (Olson, 2008; Connor, 2015; Kholeif, 2020), the research re-articulates the correlation between a physical painting and its on-screen image and in so doing expands our knowledge and understanding of painting practice within this technological moment.

Alex Bacon, an art historian, observes that 'most [paintings] are simultaneously in existence as objects and also as jpegs circulating through the internet, in ways intentional and otherwise' (Bacon, 2016). The art historian Claire Bishop also notes that 'after the pandemic forced us online to an unprecedented degree', 'we look at JPEGs more than we stand in galleries' (Bishop, 2024, p.159). Contemporary painters need to manage online images of their work when these images are not 'passive representations' but 'entities which are able to act and catalyze actions' (Steyerl, 2021).

David Joselit, who has conceptualised painting as a network,[2] proposes that 'works of art must develop ways to build networks into their form' in order to exploit their 'image power'[3] that 'is derived from networks' (Joselit, 2013, p.94). This suggestion offers the painter a way not only to rely less on social media for the distribution of their work but also to utilise on-screen images as part of the production of painting. In an age of 'hybrid spectatorship that is simultaneously on- and offline' (Bishop, 2024, p.197), my research proposes the making of a physical painting and its on-

[1] Lanier asserts that 'Online, we often have little or no ability to know or influence the context in which our expression will be understood' (Lanier, 2018, p.63).
[2] In 'Painting Beside Itself' (2009)
[3] Joselit asserts that 'images produce power [...] that is activated by contact with spectators' (ibid., p.xvi).

screen image as a reciprocal relationship to articulate the development of strategies in contemporary painting within a digital environment.

The art historian Michael Sanchez asserts that ‘networks are technical before they are social’, drawing attention to the ‘technical innovations [...] that have reconfigured conditions for the production and distribution of art’ (Sanchez, 2013). Sanchez identifies the correlation between the global use of IPS (In-Plane Switching) screens and the operation of the art world around and after 2011. He observed that paintings by Pavel Büchler, Dan Rees and Fredrik Vaerslev, shown together at a group exhibition in 2011,[4] featured ‘warm, low-contrast gray-brown tones’, which positively differ from ‘the cold colors and high contrast of both the iPhone IPS screen and its simulation via the fluorescent lights of the gallery’ (ibid.).

Regarding the reciprocal relationship between art and the digital, the art historian Andrianna Campbell-LaFleur asserts that ‘[Jack] Whitten[5] and [Barbara] Kasten, among other artists of the late 70s and 80s, helped to determine some of the aesthetic qualities of graphic user interface in the burgeoning information industry – the very graphic qualities that would mature into today’s digital aesthetic’ before their contemporary descendants like Laura Owens and Albert Oehlen (Campbell, 2016). Campbell-LaFleur suggests that ‘What really makes [paintings] digital’ is ‘how they evoke the interface and the transitory sensibilities of digital space’ (ibid.).

My paintings are aesthetically influenced by the graphical user interfaces that I experienced and developed in the ’90s and examine the potential correlations between the structural logic of painted layers and that of digital interfaces in relation to their respective grounds.[6] Bacon observes that ‘digital [screen] devices [are] morphologically very close in form as well as function to a painting’ (Bacon, 2016). The canvas is considered as an interface built for painting on the surface, corresponding to the screen that is made for what happens behind the surface.

[4] ‘The Confidence Man’ (2011) at Tanya Leighton in Berlin.
[5] Whitten worked as an artist-in-residence in 1974 at Xerox Corporation (Kuo, 2012). Its research centre developed Xerox Alto, the first personal computer featuring an early version of the Graphical User Interface (GUI) in 1973.
[6] Søren Pold, a researcher in digital aesthetics, points out that the early development of the GUI is characterised by ‘Alan Kay's development of the desktop metaphor and overlapping windows’ (Pold, 2005). I reassessed the painted layers on the canvas in comparison to the GUI windows that can be freely overlapped on screen, as discussed in Chapter 1.

Jack Smurthwaite, a curator, highlights that ‘split-screen’ paintings by ‘Lydia Blakeley, Bex Massey and Bobbi Essers’ ‘encourage audiences to read multiple images together’ (Smurthwaite, 2025). The paintings, which map the screen on the canvas, are recent examples of what may be seen as a painterly exploration of the ongoing dialogue between the two grounds in the context of social media. In each of the works, seemingly unrelated images appear to be temporarily captured in a single picture frame, reminiscent of the way Instagram feeds are scrolled on smartphone screens. Bishop highlights that ‘scrolling implies a flatness of affect’ and ‘produces an amorphous relationship to time and space’ (Bishop, 2024, p.158). Responding to online content that ‘the algorithm endlessly generates’, ‘our attention moves on’ through the ‘bottomless’ feed along the screen (ibid.).

Joselit asserts that ‘Painting has been [...] the privileged format for *negotiating attention*, for exploring the regulation and deregulation of affective time in an era of massive image production and circulation’ (Joselit, 2016, p.14). Discussing online images, which become part of ‘a giant reservoir of deferred experience’, Joselit points out that ‘The fundamental question’ ‘concerns what kind of relationship’ can be built ‘between the procedures of painting’ and ‘the digital picture’ (ibid., pp.12-16).

In an interview with the artist Amy Sillman, the interviewer[7] shares his frustration about not being able to reproduce the way in which Sillman’s paintings interacted with the light in her 2021 Berlin exhibition space[8] when he photographed them with his iPhone (Durbin & Sillman, 2023). Sillman replies that this is because her primary concern is not how her painting appears on screen,[9] and elaborates that the paintings ‘were hard to photograph because’ she left the painted layers ‘unresolved’ with ‘a lot of white ground and empty space’ (ibid.). Sillman is known for her vigorous process of creating an interaction between painted layers and the ground of painting, which, she thinks, can be hard to capture and be appreciated in a photograph.

[7] Andrew Durbin, editor-in-chief of Frieze magazine.
[8] ‘Rock Paper Scissors’ (2021) at Capitain Petzel in Berlin.
[9] Sillman says that she does not ‘work until it looks photogenic’ (Durbin & Sillman, 2023).

The difference between what the interviewer attempted to capture on his smartphone and the resulting on-screen image can also be explained by the way digital photography is generated these days, known as computational photography. When taking a photo with a smartphone, the artist Hito Steyerl explains, it is the device's computer algorithm that determines information and noise from the input data coming from camera lenses based on reference images, including the device user's other photos, and generates a photographic image in the way that the algorithm expects the user might want to see in the image (Steyerl, 2019, p.31). Digital photos of paintings we see on our screens, regardless of image resolution, may be the 'speculative and relational' products of the algorithm, which have a certain distance from the accurate reproduction of the painted works (ibid.).

Kerstin Stakemeier, an art theorist, observes that Jana Euler's paintings reflect 'the seemingly impenetrable screens of the networked world' (Stakemeier, 2015, p.265). The curator and art historian Hans Ulrich Obrist explains that 'In computer technology, most algorithms work invisibly, in the background; they remain inaccessible in the systems we use daily' (Obrist, 2018). Referring to the 'opacity and complexity' of computation, James Bridle, an artist and technologist, points out: 'Even when this opacity is penetrated, by direct apprehension of code and data, it remains beyond the comprehension of most' (Bridle, 2019, p.40). For this reason, the way the algorithm in computational photography operates as a form of network is only a limited, partial view of what is happening in digital networks behind a high-resolution screen.

Referencing Joselit's 2009 theorisation of 'painting's networks', Stakemeier highlights that '[a]uthorship is relocated within the networks' to 'a gang of initiates' (Stakemeier, 2015, p.262). The relocation also takes place on social media, this time to a diverse group of individuals, where paintings are presented and distributed in the form of user-generated content. The artist Brad Troemel asserts that '[u]nlike the previous mode of authorship, [...] the divide between artist and viewer becomes negligible when users of social media are able to more powerfully define the context (and thus the meaning) of an artwork' (Troemel, 2015, p.39).

In *“Painting” Sites* (2000-2001), the artist Seth Price creates a sequence of images of paintings retrieved from Google searches. In the work, made several years before the emergence of image-sharing social media,[10] Price not only determines the order of the images but also modifies their appearance using a video editing software. His curation and alteration of the online content of the paintings, regardless of the intentions of the painters for their works, heralds a social media feed in which user-generated content, including photos of paintings taken by and retouched on smartphones, are intertwined with advertising images that are there at the sole discretion of the online platform through its feed algorithm. The computer scientist Jaron Lanier warns that it ‘replaces your context with its context’ (Lanier, 2018, p.64).

However, the way Price acts like the feed algorithm of social media in *“Painting” Sites* (2000-2001) – or, more precisely, the way the algorithm in computational photography assembles images derived from networking resources into a unified photograph of the subject – may serve as a way to restore authorship of the online content and context of the painter’s work while still enabling them to benefit from co-authoring with a ‘network of viewer-authors’ (Troemel, 2015, p.40).

Tim Berners-Lee shared his vision in ‘The Semantic Web’ (1994), which proposes making online information ‘machine-readable’ so that ‘automated services’ in the digital network can process the information on users’ behalf (Berners-Lee, Hendler & Lassila, 2001, p.42). This idea echoes the scholar Donna Haraway’s proposition that ‘any component can be interfaced with any other if the proper standard [...] can be constructed [...] in a common language’ (Haraway, 1991, p.163). By organising the structured data of a painting in a metadata schema, or ‘common language’, the painter can create an online proxy for a painting by networking a curated set of online content through which to build the online context of their work.[11]

Joselit observes that the paintings by Cheyney Thompson featured at his 2009 exhibitions[12] ‘are networked’ in the sense that ‘they are conceptually linked to [Albert]

[10] Tumblr was launched in 2007, and Instagram was launched in 2010.
[11] The proxy containing nuanced and contextual information about a painting would function as a semantic thread that interconnects a painting and its associated online content. The development and application of the proxy is discussed and exemplified in Chapter 5.
[12] ‘Robert Macaire Chromachromes’ (2009) at Andrew Kreps in New York and ‘Pedestals, Bias-cut, /Robert Macaire/, Chronochromes’ (2009) at Galerie Daniel Buchholz in Berlin.

Munsell's colorsphere, to arcane art historical references, to Robert Macaire, and so on' (Joselit, 2010, p.131). As exemplified by Thompson, any component can be part of a network of painting. Leonie Bradbury, a curator, asserts that 'Components that were previously considered as existing outside of the work of art [...] are now part of what constitutes the work' (Bradbury, 2018, p.76). According to the sociologist Manuel Castells, networks have this structural 'flexibility' 'to reconfigure according to changing environments and retain their goals while changing their components' (Castells, 2009, p.23).

Joselit suggests that Thompson's 2009 Berlin exhibition[13] presents 'three sorts of surfaces': 'the meaningful optical surface of painting, the subsidiary support surfaces of pedestals and the explanatory discursive surfaces of text' (Joselit, 2010, p.130). Joselit points out that 'The meaning of each painting [...] is *distributed*, expropriated from its material surfaces' (ibid., p.131). Like Thompson's expansion of the network of his painting beyond a given individual ground, a physical painting can be made into a distributed network operating across material and immaterial grounds.

Bruno Latour, one of the prominent figures in actor-network theory, gives a succinct definition of network: 'the notion of network is of use *whenever action is to be redistributed*', and a network 'is fully dependent on its material condition' (Latour, 2011a, pp.797-802). Latour notably 'gives' a role to 'nonhumans', such as objects, in their interaction with humans (Sayes, 2014, p.134). Latour's notion of network articulates a painting as a network created by the painter's interaction with all kinds of objects. In making *, World!* (2023) for my 2023 solo exhibition, for example, my inclusion of the gallery wall as part of the painting changed the 'material condition' of the network, because I used the wall as the painting's ground. The painting was digitised in both image and text formats, with which its online proxy was made. The proxy functions as the 'tooth' of the internet, on which the transforming image of the painting can be built. By doing so, the painting's ground is further expanded online.[14]

[13] 'Pedestals, Bias-cut, /Robert Macaire/, Chronochromes' (2009) at Galerie Daniel Buchholz in Berlin.
[14] The process of making *, World!* (2023) is discussed in Chapter 4.

The art critic and theorist Isabelle Graw notes that, despite certain limitations,[15] Latour's proposition that 'objects or "things" should be regarded as actively involved in courses of action is no doubt productive in some ways' (Graw, 2018, p.278). In particular, Graw highlights that 'Latour's premise [...] recognizably echoes the conception of network painting' (ibid., pp.278-279). Graw considers that 'Euler's electrical socket pictures, *Where the Energy Comes From,*[16] [...] function as network painting in the sense Joselit has outlined' (ibid.). Joselit states that his theorisation of digital formats as 'dynamic mechanisms for aggregating content', in contrast to mediums in an art context, is informed by Latour's thinking (Joselit, 2013, p.55).

This is where Latour's idea of the network correlates with the social scientist James Ash's idea of the interface. Ash asserts that 'interfaces should be understood as composed of inorganically organized objects' (Ash, 2015, p.12). Like Latour's idea of the network, Ash's idea of the interface can articulate how a painter organises certain objects into a painting by creating particular qualities between them.[17] For example, in my sewn-canvas paintings, linen offcuts are stitched together in a way that will generate the stretchable quality of the sewn cloth.[18] The cloth is stretched over a wooden frame in order to create the tautness and resilience of the ground for painting. In this way, the idea of painting as a network, arranged by the painter, can be reiterated by the idea of painting as an interface designed by the painter, and vice versa.

A conceptual framework that adopts the complementary relationship between the two notions can be built. This framework is comparable to Gilles Deleuze's diagram[19] in the sense that they both concern 'an action, not a thing but a moment, a moment

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[15] Graw asserts that Latour 'overestimates' the power of objects and 'blurs the distinction between subjects and objects, whose particular contours in a given setting then become invisible' (Graw, 2018, p.278).
[16] For installation views of Euler's paintings, see: https://www.contemporaryartlibrary.org/project/jana-euler-at-bonner-kunstverein-bonn-8849 (Contemporary Art Library, n.d.).
[17] Ash proposes the concept of 'transduction', which means 'a process by which objects in interfaces are organized by designers to produce particular qualities for other objects in that interface and for the people using that interface' (Ash, 2015, p.28).
[18] The stretchable quality also partly stems from the woven structure of each scrap. In this regard, Ash elaborates that 'interfaces are [...] ecologies of objects, each of which has their own reality and capacity for relation with other objects' (ibid., p.31).
[19] Informed by the work of the painter Francis Bacon, Deleuze describes: 'The diagram is the operative set of traits and color-patches, of lines and zones' (Deleuze, 2003, p.102).

of transformation' (Sillman, 2020, p.131). A happy accident, an unexpected but potentially favourable outcome that occurred while painting, can be articulated by either the framework or Deleuze's diagram. The happy accident may or may not happen on the canvas, depending on the painter's 'evaluation of the pictorial order to come' (Deleuze, 2003, pp.102-103). Both the framework and the diagram can map the painter's steps in the 'pictorial experience', empowering the painter to 'pass through the catastrophe themselves, embrace the chaos, and attempt to emerge from it' (ibid.).[20]

Alexander R. Galloway, a computer programmer, highlights that 'networks define nodes and edges, but they do not define the holes in the net' (Galloway, 2021, p.237).[21] Undefined areas of a network, such as its holes, are where painters can build new connections while breaking previous ones within and beyond the network. In relation to fostering a relationship between networks, Ronald S. Burt, a social scientist, asserts that 'good ideas are disproportionately in the hands of people whose networks span structural holes' (Burt, 2004, p.349). Galloway points out that 'computation in the twentieth century is defined more by the limits to computation, more by the uncomputable, than by a positive set of capacities' (Galloway, 2021, p.2). Similarly, by reinterpreting my process of making *Interface AS* (2020) in a programming language, the physicality of painting was confirmed by identifying the untranslatable (uncomputable) aspects of the process.[22] In this sense, contemporary painting practice can further its ongoing mutual relationship with the internet not only by increasing the proximity between them but also by identifying the persistent gap that exists between them.

[20] What causes a happy accident can be described by using Ash's notion of interface, which reveals the dynamics between the components of the interface in relation to the painter's actions. The painter's response to the happy accident can be understood by Latour's notion of network, in which 'action is to be redistributed' (Latour, 2011a, p.797). How a framework that combines both notions serves painters is exemplified in Chapter 3.
[21] Latour also notes that a network is 'composed mainly of voids' (Latour, 2011a, p.802).
[22] The translation is discussed in Chapter 1.

0.4 Methodologies

Studio-based painting practice

I used my painting practice as the central method for conducting this research through practice. Given the largely non-verbal and sometimes indescribable nature of a practice that has its own pace and language, I maintained flexibility by using the physical practice to examine my research questions.

In the early stages of this research, I made acrylic paintings to explore the physical nature of the painting-canvas: its dimensions, weight, shape, colour and tactility, its static but live nature, and its stackability and dependency on light.

The middle stage of this research roughly coincided with the last phase of the global COVID-19 pandemic. During this period, I experienced supply shortages in painting materials due to network failures, and I relied heavily on the internet to proceed with the research. In response, my painting practice navigated the issue of material sustainability and this increasing reliance on digital interfaces and networks. To identify a correlation between my practice and these interfaces and networks, I examined my painting process from Ash's (2015) notion of the interface and Latour's (2011) notion of the network.

In the final stage of this research, I used my 2023 solo exhibition in South Korea as an opportunity to expand my painting practice beyond my studio space and in an online context. I made paintings for the exhibition based on my understanding of the notions of the interface and the network to examine whether these notions would still be applicable to the practice in an exhibition context.

Translation into programming language

Since I usually think in my native language, Korean, whilst painting, writing down my reflections about my painting process for this research naturally involves translating them into English. I struggle to pursue an accurate and complete translation of what I am thinking and a figurative description of my act of painting. My empirical understanding of the limitations and ineffectiveness of translating the physical

practice into a foreign human language has therefore led to the idea of translating the practice into a more efficient programming language.

I translated the practice into a programming language called Visual Basic 6.0, which I had previously used to develop computer programmes while working as a software engineer. The language seemed suitable for describing the act of painting, as it is categorised as an event-driven procedural programming language and widely used to develop the GUIs (graphical user interfaces) of application programmes in the early 2000s. From the perspective of computational thinking, I used a divide-and-conquer algorithm to divide my practice into three groups of processes: before, during and after painting. I translated a sequence of my actions and my decision-making for each process into Visual Basic. I then examined my translation by interpreting the differences between the aspects of the practice that could be translated into the programming language and those that could not.

Creating an online proxy for a painting

I used my 2023 solo exhibition as a platform to digitise my acrylic paintings. My aim was to test my idea of creating an online proxy for a painting in a real-life setting. The reason for digitising the paintings on display at the exhibition, rather than in comparison to in a more controlled environment such as the studio, was to identify and discuss the potential issues that can unexpectedly arise on site. I made digital images of the paintings in multiple image formats, including photographs, video and 3D scans to understand each format’s strengths and weaknesses in containing and conveying the physicality of painting.

0.5 The paintings

The physicality of painting

I choose to depict objects in my paintings that I have had direct personal experience of, such as a CRT (cathode-ray tube) television, a videotape, a school locker and an Amazon Locker.[23] I select my subject matter to examine the physicality of painting through the lens of the object.[24] To do this, I seek physical, functional and/or conceptual similarities between the object and the canvas. For this reason, my paintings extensively explore rectangular-shaped objects, because they fit into the rectangular frame of a canvas, with hardly any space left between the outline of the object and the edges of the ground.[25] In reference to Michael Craig-Martin's (b. 1941) use of everyday objects, his subject matter, on the other hand, is strictly based on its 'familiarity' to us (Craig-Martin et al., 2024, p.33). The artist is 'looking for something that represents its type in its clearest essence' (ibid.).

Craig-Martin's single-object painting features a colour-filled outline drawing of his chosen object. The artist makes the drawing in a way to ensure the immediate 'recognisability' of the subject (ibid.). Craig-Martin says he 'need[s] viewers to recognise the object immediately because in a sense that's all [he is] giving them' and then '[e]ach person adds their personal experience' to the painting (ibid.). For me, making a preparatory drawing of a chosen object as part of the painting process is a way of interpreting the object as a user interface based on my previous experience of the object. For example, the subject of *Interface T* (2019) is a CRT television. I was intrigued by how the canvas and the old television both display images. While a painted image is physically and irrevocably built on the canvas, a television image is electronically and temporarily generated behind the screen, by electron guns located inside the CRT, based on signals delivered through AV (audio/video) cables. When thinking of the old television while staring at a blank canvas, I was reminded of the bulky, angular shape of the back of the television,

[23] When asked how to 'select which objects to draw', Craig-Martin replied: 'A lot of the things I've drawn I own' (Craig-Martin et al., 2024, p.32).
[24] In terms of the role of the subject matter in my exploration of the physicality of painting, I echo Jack Whitten, who notes that 'Subject matter is important but only as a catalyst' (Whitten, 2018, p.368). While I attend to the canvas through my subject matter, Whitten focused more on paint.
[25] The retrospective exhibition 'Michael Craig-Martin' (2024) at the Royal Academy of Arts in London featured paintings freely exploring non-rectangular objects, such as corkscrew, paper cup and chair.

which houses the volume of the CRT unit, and the panel for the RCA AV cables located on the side. In this way, the painting displays a schematic image of the subject that has been filtered through my personal memory.

Figure 0A. *Interface T* (2019) Acrylic on linen, 55 x 75 cm

Craig-Martin uses ‘only the most vibrant hues’, based on his idea that ‘Anything can be any colour’ (Craig-Martin, 2019, pp.236-238). I echo the way Craig-Martin uses colour not ‘to describe an object naturalistically but to emphasize its physical presence’ (ibid., p.241). In *Interface T* (2019), I use colour to diagrammatically depict the subject, the back of a CRT television, by ‘show[ing] plane changes or the difference between inside and out’ (ibid., p.240).

Craig-Martin reiterates the artist and colour theorist Josef Albers’ lesson that ‘the colour as we perceive it changes depending on the quantity’ (ibid., p.51). As

demonstrated in *Cassette* (2002),[26] Craig-Martin makes good use of a vibrating optical effect by putting two vivid colours of the same value, e.g., red and green, in the painting. This optical effect is heightened by the large dimensions of the canvas – 289.6 x 208.3 cm.[27]

I seek to create harmony in my colour palette, including the colour of the raw linen canvas. In *Interface T* (2019), I chose yellow ochre from my early visual memory of the subject, the old television. I then used colours that are both analogous to, and of the same value as, the yellow ochre to promote the interaction between colours in order to create a sense of cohesiveness within the confines of the painting's ground. In doing so, I mapped the subject onto the canvas using colours as visual links between its different elements.

Multimedia Double Canvas series (2009), by Simon Denny (b. 1982), is a floor-based installation of several canvases which trace 'the evolution of television size' (Bacon, 2016).[28] In this multipart work, the Berlin-based artist prints pairs of photographs of televisions that have gradually changed over the past decades onto canvases of various sizes and stands the pair upright, set apart from each other at a specific distance, linked by metal frames, to suggest the actual dimensions of each television (ibid.). Denny uses ready-made canvases, which contrasts with the increasing flatness of televisions over time. For me, the work draws more attention to his use of the consistent depth of the pre-stretched canvas.

Through making *Interface T* (2019), I explored the correlation of the canvas with the subject in terms of their respective shape and dimensions. The depth of the stretcher was an important factor in my painted image, affecting how I depicted the depth of

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[26] For an image of *Cassette* (2002), see: https://www.theguardian.com/artanddesign/2015/nov/24/michael-craig-martin-transience-serpentine-gallery-review-a-malevolent-graveyard-of-tech (Searle, 2015).

[27] I learnt how to create the optical effect while attending a class on colour at the School of the Art Institute of Chicago. The class, taught by former Professor Betsy Rupprecht was organised based on Josef Albers' influential book *Interaction of Color* (1963). Although being impressed by the power of colour, I tend to eschew this kind of strong visual impact because it can be distracting and/or irritating to the eye.

[28] For installation views of *Multimedia Double Canvas* series (2009), see: https://simondenny.net/video-aquarium-sculptures-main/ (Simon Denny, n.d.).

the angular form of the back of the old television.[29] I also tried various stretcher bars of a greater thickness to explore and highlight the difference between a painted image on a canvas and a two-dimensional flat digital image on the screen. I was further intrigued by how the depth of the stretched canvas can facilitate stackability, as seen in *Interface T6* (2019), where I played with the physicality of the canvas, shown in the image below.

Figure 0B. Installation view of *Interface T6* (2019) at 'There's something lurking in the shadows that might be interesting' (2019) at the Dyson Gallery, Royal College of Art, London

[29] I do not use relatively thinner ready-made canvases but tongue-and-groove stretcher bars that enable me to assemble stretcher frames in the required dimensions and depths.

Figure 0C. *Interface L* (2020) Acrylic on linen, 180 x 120 cm (6 parts)

Mapping the screen onto the canvas

The ‘split-screen paintings’ by Lydia Blakeley, Bex Massey and Bobbi Essers mentioned above represent the way mobile screens are shaping the way we consume various digital photos circulating on the internet (Smurthwaite, 2025). The paintings juxtapose two images on a single canvas by splitting the picture plane into two, either horizontally or vertically. This pictorial composition instantly reminds us of how we browse multiple online images simultaneously on a single display, like scrolling through Instagram feeds on smartphones.

My painting *Interface L* (2020)[30] is about composing images within the frame of their ground(s). It explores how the composition is framed, and by whom. When we see a digital image which is larger than the display, that image is either automatically resized to fit on the screen or cropped around the edges of the screen. In social media, image composition and framing are designed and controlled by the companies who own the platforms. In the polyptych painting, which depicts either one of the two images of a school locker – the interior or exterior space of the physical object – the image is cropped by the edges of each canvas, like the split-screen paintings. Specifically, I crop the image of the subject on each canvas based on the combination of the dimensions of the canvas and its placement within the painting.

The digital culture theorist Lev Manovich asserts that ‘the phone screens and Instagram app interface’ define ‘the specific characteristics of [the] Instagram medium’ (Manovich, 2017, p.109). The social media’s user interface is characterised by vertical scrolling on its image feed, featuring an endless tapestry of images woven by its algorithm in a linear grid composition tightly framed by the hand-held screens. Bishop highlights that ‘scrolling produces an amorphous relationship to time and space’ (Bishop, 2024, p.158). In this sense, regardless of image quality, any on-screen images of *Interface L* clearly distance themselves from the painted work, which operates with fixed dimensions, 180 x 120 x 3.6 cm, in a physical environment

[30] *Interface L* borrows the colour palette of Craig-Martin’s *Untitled (iPhone purple)* (2013), which depicts an iPhone with a light-blue screen set against a purple background. I saw this painting in person at his exhibition ‘Michael Craig-Martin: Transience’ (2015) at Serpentine South Gallery, London after a colleague at the Royal College of Art sent me a photo of the painting. My interest in the similarities and differences that are shared between our paintings has been ongoing since.

where an up-and-down movement of the canvas painting cannot happen. If this vertical movement were to occur in real life at the speed of scrolling, unlike in the digital environment the polyptych painting hung on the wall would collapse onto the floor.[31] *Interface L* highlights the surrounding wall of the canvases as its extended ground on which its composition of six images is made and maintained.

The split-screen paintings build tension through the juxtaposition of the two images photographically rendered on one canvas, which is open to multiple interpretations. In *Cryobank Greg* (2024) by Massey,[32] for example, Smurthwaite senses 'a sexual tension reverberating between one image and the other' (ibid.). In this regard, *Interface L* does not seek to create tension of any kind between its painted images. If there is any tension in the painting, it may be the invisible grid structure on its ground (the wall) that guides the placement of the six canvases within its overall envelope, which creates spatial tension between the canvases.

This is how I map a painting's material ground (the canvas) onto an immaterial one (the internet), i.e., in the reverse direction of *Interface L* and the split-screen paintings that currently map the digital screen onto the canvas. The internet has an underlying structure that is similar to the grid structure of the wall-based work. To summarise, the internet protocols are hidden within the fabric of the internet but are actually in charge of controlling any online content (Galloway & Thacker, 2004, p.9). It is the conception of the idea of an interdependent structure of multiple images explored in the polyptych painting that enables the development of an online proxy for a painting.[33] To facilitate the proxy, it is necessary to have a framework that supports the proxy to connect the online images of a painting (in various image formats) to each other and the work. The internet protocols can function as the underlying framework that may be invisible to the eye but that is crucial to combining online content together on behalf of the painter.

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[31] A similar question arises when seeing the photo of *Interface T* (2019), a painting of a CRT television, on Instagram. The painting operates partly by contrasting an old television, usually grounded on the floor due to its weight, with the canvas that is comparatively light enough to be hung on the wall with a nail. The discrepancy between the two motivated my development of an online proxy for a painting.

[32] For an image of *Cryobank Greg* (2024), see: https://www.seventeengallery.com/artists/bex-massey/ (Seventeen Gallery, n.d.).

[33] The conceptual and technological aspects of the proxy are discussed and exemplified in Chapter 5.

The ground of painting

My logic in priming a stretched linen canvas and constructing a painted image on this ground works in a similar way to the contemporary smartphone generating a photographic image when the user of the device takes a picture. Hito Steyerl (b. 1966) observes that a computer algorithm implemented on the device is 'to discern the picture from inside the noise' from 'the data being captured by the camera sensor' (Steyerl, 2019, p.31).

According to the art historian Michael Sanchez, particular paintings by Fredrik Vaerslev (b. 1979) that he observed in a 2011 group exhibition[34] appeal to the viewer's perception by using grey to ease and stimulate the process of the eyes that 'filter[s] signal from noise' (Sanchez, 2013). Sanchez calls the Norwegian artist's paintings[35] 'gray noise' because they provide 'no information at all' in the sense that the colour is 'an undifferentiated mixture of all other colors' (ibid.). Sanchez notes that 'Vaerslev's gray paintings manifest this noise within their very frames', revealing a correlation between the paintings, 'the fluorescent lights of the gallery' and 'the iPhone IPS screen' (ibid.).

I use transparent, rather than white, gesso for priming the linen canvas. By doing so, I am able to exploit the warm grey-brownish colour of linen, which contrasts favourably with the cool white tone of the wall surrounding the canvas, like Vaerslev's "gray noise" against a cold fluorescent light or a bright mobile display.[36] While the linen cloth looks like a block of solid grey-brown from a distance, up close, one notices that its woven texture is constructed of a range of colours buzzing around the grey-brown. The colours are noise, but at the same time information, depending on each pictorial situation in which I use the texture in relation to nearby painted textures.

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[34] 'The Confidence Man' (2011) at Tanya Leighton Gallery in Berlin.
[35] For an image of Vaerslev's painting, see: https://www.phillips.com/detail/fredrik-varslev/NY010215/2 (Phillips, n.d.).
[36] Relatedly, I use the bumps and irregularities in the weave of linen cloth when making a canvas. The number, size, shape and location of these vary in each canvas. Rather than cutting them off with a razor blade while preparing the canvas, I let them be, in the hope that the noise will remind the viewer of the cloth's woven pattern, most of which will be covered by layers of opaque paint, and prevent the sleek, smooth surface of the acrylic layers from appearing monotonous and dull.

As exemplified in both Vaerslev's grey paintings and my paintings, using noise in the creation of a painted image means adding noise to, or not subtracting it from, the output of the physical process. This logic also explains how a computational algorithm refines digital images, as Photoshop does. Galloway suggests that 'Images are improved via anti-aliasing,[37] [which is] essentially a form of aesthetic noise' (Galloway, 2021, p.4).

Likewise, I add 'aesthetic noise' when creating the hard-edged shapes and lines with paint on the canvas using masking tape. When sealing a section of the ground each time, I adjust the amount of pressure I put on the adhesive tape to control the amount of paint that will bleed under the tape. In doing so, I obtain the hard-edged lines with a degree of noise that makes the lines neither too sharp nor soft, striking an aesthetic balance between the mechanical quality of the subject of the painting and the hand-made quality of the work.

A similar aesthetic logic is applied to the painted shapes. The gessoed surface of the canvas provides 'tooth' for holding paint on the ground. This tooth disperses the colour pigments over the ground in coordination with the texture of the canvas. The application of paint on the canvas results in a solid texture achieved through the painted layers, which very gently contrasts with the woven texture of the linen. I therefore treat and utilise the tooth as noise to amplify the subtle contrast. The tooth can bear up to a maximum of seven coats of acrylic paint before losing its grit, within which time I seek to find a balance in the texture of the painted layers that sits between the machine-made and hand-made.[38]

Steyerl draws attention to who 'define[s] noise and information as such' and with what criteria (Steyerl, 2019, p.33). The distinction between the two can be blurred as much as their definitions are malleable. Suggesting that in Cheyney Thompson's 2009 exhibitions the artist is interested in 'an effort to articulate the "information" inherent in a painting with "noise" that characterizes both its internal references and

[37] Anti-aliasing is a technique used in computer graphics that blends the colours of pixels along the edges of objects (the outlines of items) in order to make the lines appear smoother and more natural.
[38] For example, I increase the thickness and smoothness of the painted layers in my paintings about the Amazon Locker, as in *Amy* (2023) and *Hello* (2023), whereas I reduce these qualities in the works about old CRT television as in *Interface T* (2019), *Interface T6* (2019) and *Preloved* (2022).

its external histories of circulation', Joselit summarises that Thompson's paintings are immersed in 'informational noise' (Joselit, 2010, pp.129-131).

Galloway asserts that 'an interface is not a thing' but 'always a process or a translation' (Galloway, 2008, p.939). I use my linen canvas in this sense of interface, the process of building a painted image on the ground, to translate the subject into my language of painting. The language naturally evolves to reflect my changing perspective on how to use the physicality of the linen canvas – its dimensions, weight, shape, colour and tactility, its static but live nature, and its stackability and dependency on light – as the vocabulary to interpret each subject. My interpretation of the noise and the information that are part of the physical ground also shifts according to the subject of the painting.

Figure 0D. *Interface V* (2021) Acrylic on linen, 91 x 51 cm

For example, I began translating the subject of *Interface V* (2021), videotape, by visualising a schematic image of the object onto the canvas, or, more precisely, bringing forth that image from the grey noise (linen) onto the ground. I simultaneously examined the similarities between the subject and the canvas. For me, the canvas records my brushwork like magnetic tape spooled in a video

cassette. Any brushwork on the canvas can be covered by another mark just as magnetic tape can be overwritten. The excessive use of the tooth of the ground may cause it to lose its function of holding the paint layers. Based on these functional similarities, I used the surface of the canvas as a vocabulary to articulate the subject of the painting. I applied paint unevenly along the edges of the canvas to highlight the tooth of the ground, grey noise, by bleeding the colour.[39] This 'noisy' information, uneven and irregular in the texture of the paint, recorded by the friction between the tooth and the paintbrush, manifests the nature of the subject (and that of the canvas), analogue media. I also left two large areas, aligned vertically on the canvas, unpainted to indicate the transparent plastic case revealing the inner contents of the cassette shell.

As exemplified in *Interface V*, my painterly language aims not to depict the subject naturalistically but rather to examine the physical, functional and/or conceptual similarities between the subject and the canvas. By reflecting the individual dynamics between a stretched canvas and each subject, my painting distances itself from a literal interpretation of the subject, causing tension between the subject and the painted image on the canvas.

[39] Computational photography exploits noise when producing a picture: 'It will increase the amount of noise just as it will increase the amount of random interpretation' in the picture (Steyerl, 2019, p.31).

Figure 0E. *Anderson* (2021) Acrylic on linen, 50 x 40 cm each (4 parts)

The canvas as a module

The COVID-19 pandemic was a transitional moment for my relationship with the canvas. During this period when the practice-based research came to rely almost solely on digital interfaces and networks, I translated my painting process into a

programming language.[40] While reconsidering the tactile process from a digital perspective, I formulated an idea of the canvas as a module. In computer programming, a module is a unit that is coded to perform a specific function, and, for practical reasons, it is required to be written in a very standardised way. Setting aside the specificity of each canvas that is discussed above, I realised that I had been preparing the canvas in a way that is similar to writing a module in programming. In particular, I optimised the process of making the ground to make the use of painting materials more efficient.

I explored this idea of the canvas as a module by preparing several canvases of the same size and creating multi-panel paintings about the Amazon Locker, an electronic modular locker. Through an offline exhibition of *Anderson* (2021),[41] I learnt that it was crucial for the canvas to be of certain physical dimensions in order to create a sense of presence for the in-person viewing experience: for the viewer to feel as if they are standing in front of an Amazon Locker.[42] Unlike a programming module, that has virtually no size, both the canvas and the Amazon Locker have their own physical dimensions, which significantly shape their respective functions. *Anderson* prompted me to further examine the physical ground of painting from both material and immaterial perspectives.

Amy Sillman (b. 1955) observes the fundamental difference between ‘painting’s way of interlacing the figure and the ground’ and ‘digital layering’ (Sillman & Stopa, 2024). Sillman’s paintings feature complex ‘layered relations’, where the elements are challenging to ‘cut, drag, and paste’, unlike ‘digital layering’ (ibid.). Regardless of the complexity of layering, the amalgamation of painted layers and their ground seems impossible to reverse. Acknowledging this material nature of painting, I wondered, what if I could manage painted layers in the same way as manipulating digital layers?

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[40] It was my attempt to examine my research question of how my painting practice can correlate positively with interfaces and networks in a post-COVID contemporary context. This topic is detailed in Chapter 1 and the translation of my painting process is in Appendix II.
[41] ‘Unruly Encounters’ (2022) at Southwark Park Galleries in London.
[42] As detailed in Chapter 4, the standard height of the locker is just under two metres.

Figure 0F. *Interface Shipping* (2021) Acrylic on linen, 50 x 40 cm each (2 parts)

I explored the idea of peeling off painted layers from their ground through making *Interface Shipping* (2021). I approached this painting as if I were using Photoshop to edit digital images. The painting took its source image from the centre canvas of *Anderson*, which portrays Amazon Locker's central module, which is equipped with a touchscreen interface for its customers. In this instance, I used two canvases of the same size – modules, like digital layers that can be easily manipulated in the image editing software. I detached three painted shapes (camera lens, touchscreen and barcode scanner) from the source and then placed the shapes on the left-hand canvas while leaving the rest of the touchscreen interface on the right-hand canvas in *Interface Shipping*.

This approach was new and yet simultaneously familiar to me in the following sense. My way of preserving large unpainted areas of the linen canvas do not leave much room for either erasure or trial-and-error experiments during painting. To overcome

this limitation, I instead make several versions of the painting on different canvases with variations in the painted lines, shapes, texture, hue and value adjustments. This strategy enables me to make and choose the final version. Along with my other paintings made in this way, *Interface Shipping* was thus one of the few, if not the final, survivor from the selection process. In this sense, my approach to using the canvas like a substitutable layer, as in *Interface Shipping*, echoed how several layers can be simultaneously exploited in Photoshop, whereby many of the layers, that may or may not contain visible shapes, can be hidden in the rendered outcome of the digital image creation.

In her 2023 exhibition in Naples,[43] Sillman offered the viewer a rare glimpse of her process of constructing the painted layers on the ground. In *Temporary Object* (2023),[44] forty-one digital images printed on aluminium illustrate each stage of her painting, in many of which the traces are invisible in the finished work.[45] The multi-panel installation 'testifies to the artist's process' (Gluibizzi, 2024). Sillman reanimates the temporal moments of painting – 'how it comes to be', 'how it gets ruined', 'how it turns around' and 'how it changes' – which are usually hidden between painted layers and amalgamated with the layers and the ground, and presents in such a way that 'a person could walk across the space' (Art21, 2024). By doing so, Sillman extends her painting beyond the boundary of the physical ground.

As much as her painting process is 'about finding a way to get some stuff on' her ground, Sillman explains that the process is also 'to get it out of there' and so 'removal is a big part of' the process (ibid.). Similarly, I made *Interface Shipping* in a way akin to tearing apart an iPhone to inspect how its internal components are assembled, and with what kind of parts. While using the canvases like trays arranged for the disassembly of the digital device, I felt as if I was dismantling the centre canvas of *Anderson* into its components.[46] Through creating *Interface Shipping*, I was able to understand James Ash's notion of interfaces as 'inorganically

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[43] 'Temporary Object' (2023) at Thomas Dane Gallery, Naples.
[44] For installation views of *Temporary Object* (2023), see: https://www.amysillman.com/exhibitions/temporary-object/ (Amy Sillman, n.d.).
[45] Sillman 'wanted to unpack and excavate actually the whole history of one painting' (Art21, 2024).
[46] As shown in Figure 0E, the canvas depicts the user interface module of the Amazon Locker, which is equipped with touchscreen, camera lens and barcode scanner.

organized objects' (Ash, 2015, p.12).[47] This experience has enabled me to see and embrace the idea that a painting is an interface made up of components, which work together to perform its function.[48]

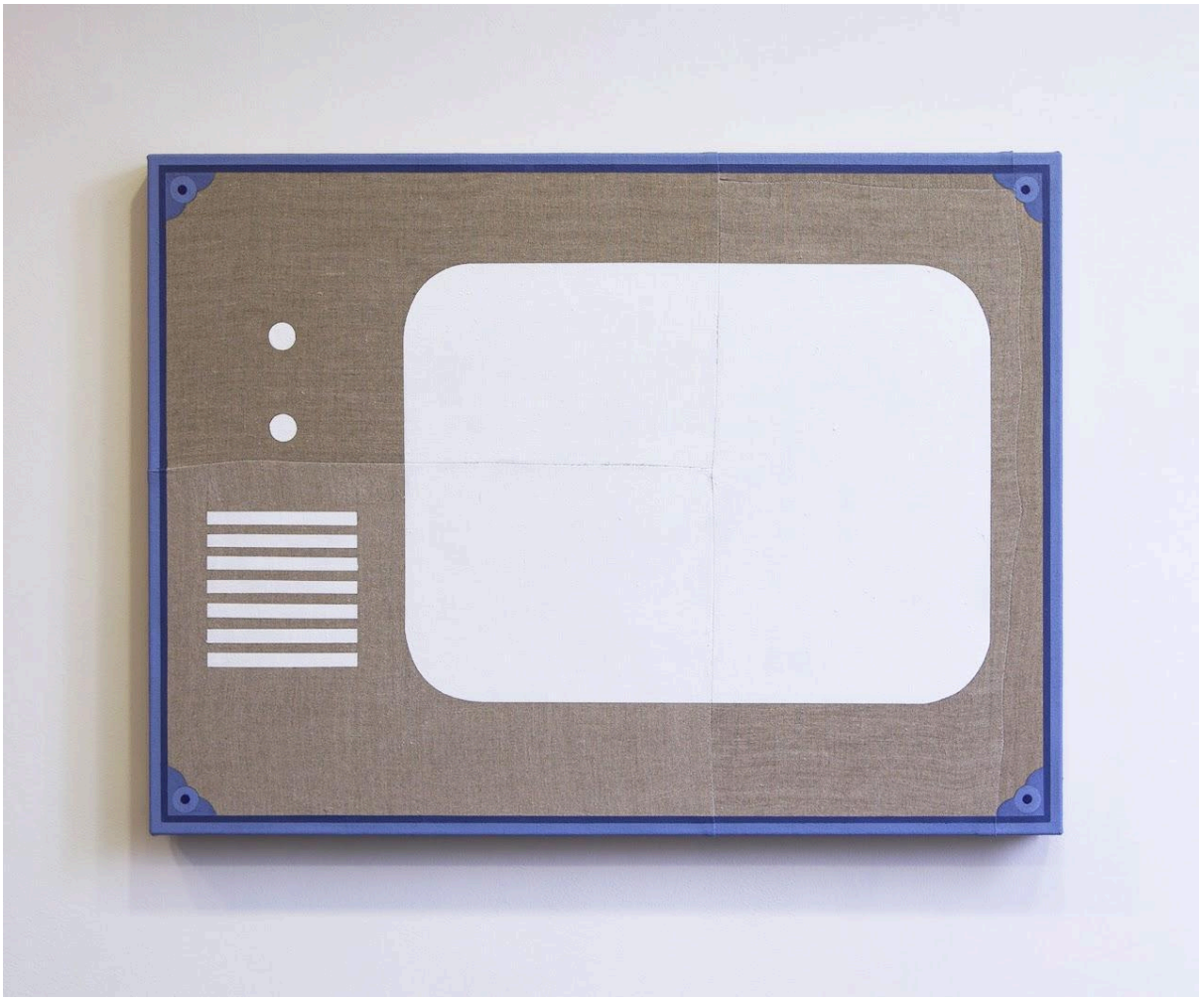

Figure 0G. *Preloved* (2022) Acrylic on linen, 55 x 75 cm

The sewn-canvas painting

When I first made a stretched canvas using stitched-together linen offcuts,[49] I was concerned that the seams on the sewn canvas might conflict with the painted image on the surface and distract the viewer's perception of the subtle nuances of the painting. I therefore created *Preloved* (2022) to test whether the sewn canvas could

[47] James Ash's 2015 notion of interfaces is discussed in Chapter 3.
[48] With this perspective, I wondered how I could integrate the digital contents of a painting, available in different formats, into the digital version of the work that encompasses detailed and nuanced information about the painting and the process, like Sillman's *Temporary Object* (2023).
[49] The process of making the sewn canvas is discussed in Chapter 3.

ever be a suitable support for making a painting. I did not attempt to subdue the sensory stimuli of the seams with overpowering pictorial elements such as vivid colours. Rather, I intended to identify their role in my painting by opening a dialogue with the unfamiliar materiality of the sewn canvas.

I chose a CRT television as the subject of the painting. Considering the life of the object, once ubiquitous but outmoded over time and now mostly stacked up in abandoned places, its life cycle resonated with my interest in recycling linen offcuts, the by-product of my painting practice that was piling up in my studio, back into the practice. In this regard, I found that the seams running across the surface of the sewn canvas embodied the sense of a broken old television.

Preloved was not made to full-size scale. Although I considered the typical 4:3 aspect ratio of the CRT screen when determining the size of the canvas, I chose a slightly different size to avoid confining myself to that generic dimensional ratio. In doing so, I intended to give the painting's pictorial elements further room for improvisation on the premise that the elements would have their own dynamics and tensions in a pictorial sense. Rather than depicting the subject naturalistically, I used this scope to focus more on examining what the seams on the sewn canvas bring to the painting through the lens of the subject.

Along with the inherent colour of linen, white was another key colour in *Preloved* that I used to indicate the void areas. For example, instead of depicting the CRT screen in a representational way, I painted a large white rectangular shape with rounded corners on the canvas to suggest the positioning of the video display component of the television. This created an optical effect when the painting was hung on a white wall, making the white-painted areas on the canvas appear to fade into the wall. This optical effect was devised to ensure that the painting's subject was presented in a reduced way.

Jack Whitten says that 'it is necessary to have a stretched canvas which gives [him] the FOUR EDGES to work with' (Whitten, 2018, p.62). In this regard, Helene Appel's (b. 1976) painting either effectively extends all the edges of her linen canvas beyond

the peripheral vision of the viewer, as in *Sandpit* (2021),[50] or blurs the distinction between the linen canvas and the white wall, as in *Trousers* (2024).[51] Thanks to this optical effect, that creates an immersive experience of the visual realm, when I encountered Appel's paintings in person[52] I felt teleported to the world that the painter had created.

In *Preloved*, I painted all the edges of the linen canvas, sealing it with a light purple-blue colour, to contain both the brightness of the white-painted areas and the warmth of the linen canvas within the picture frame. I used this colour, reminiscent of the outer plastic shell of an outmoded broken television, worn and paled over time, to help the seams running across the sewn canvas to highlight the obsolescence of CRT television. As a result, by restricting the expansion of the pictorial space beyond the picture frame of the linen canvas, the edges of *Preloved* highlight that the painting is an object with a fixed size. Unlike Appel's painting, *Preloved* is not intended to invite the viewer into the painter's world. Rather, it contains the painter's visual memory of the subject in the form of a painted image, which may be seen as a visual teaser.

Claire Bishop draws attention to the way today's instant 'digital communication' 'generat[es] a hybrid spectatorship that is simultaneously on- and offline' (Bishop, 2024, p.197). At the opening of a group exhibition[53] that featured *Preloved*, another exhibiting painter told me that she was happy to discover the seams on the surface unexpectedly. I was glad to learn this, while simultaneously alarmed by the fact that she had overlooked their existence, despite having seen images of the painting on Instagram. Her feedback motivated me to examine the dynamic between a physical painting and the on-screen image of it in the age of 'hybrid spectatorship' (ibid.).

[50] For an installation view of *Sandpit* (2021), see: https://www.contemporaryartlibrary.org/project/helene-appel-at-the-approach-london-42300/13 (Contemporary Art Library, n.d.).
[51] For an image of *Trousers* (2024), see: https://www.contemporaryartlibrary.org/project/helene-appel-at-the-approach-london-42300/27 (Contemporary Art Library, n.d.).
[52] 'Background' (2024) at The Approach in London.
[53] 'Contemporary British Painting Prize' (2022) at Thames-side Studios Gallery in London.

Figure 0H. *Frankenstein* (2022) Acrylic on linen, 91 x 41 cm each (3 parts)

Painting as a hybrid network

Frankenstein (2022) depicts the school locker that I used while attending the School of the Art Institute of Chicago. I created this painting by reconstructing the painted images of *Interface L3* (2014)[54] on a new sewn canvas ground made with linen offcuts, some of which originated from that period. By doing so, I reconsidered my previous idea of managing opacity to strike a balance between accessibility and privacy that I had explored in *Interface L3*, in the context of the contemporary networked environment.[55]

[54] I was intrigued by the subject because both the canvas and the locker are containers whose physical dimensions are mainly shaped by their functions. The original work explores how private space is created within public space as both an individual object and a collective cluster.

[55] Steyerl suggests that 'Invisibility is a screen that sometimes works both ways—though not always' (Steyerl, 2019, p.95). Walking down the corridor lined with hundreds of identical anonymous lockers, I was intrigued by the way this privacy served the lockers' users. I felt it was safe to store my painting materials in this public space by relying on the 'screen', which, equally, prevented me from knowing what other students stored in their lockers. Steyerl warns that invisibility 'works in favor of whoever is

Frankenstein can be considered in relation to Seth Price's (b. 1973) recent paintings (2022-2024) in the sense that sewing is an important process of the development of both works. *Frankenstein* extends the ground of painting by stitching different moments and places into the form of a network. Price merges photographic images of the physical world with images from digital computer graphics. For example, *Moonlight* (2024)[56] stitches the material (trees lit under the moonlight; gestural painted brush marks) and the immaterial (geometric shapes from computer graphics) together into a hybrid.

Unlike *Frankenstein*, *Moonlight* (2024) appears almost seamless. Only upon closer inspection in the flesh[57] does one discover the intangible seams running between the two different worlds, which are camouflaged by a convincing depiction of light and shadow. In doing so, Price manages to thread the material with the immaterial in a way that makes the patchwork of the two look virtually seamless. What is interesting to me is the way the threads operate differently in each work. The polyester threads used in *Frankenstein* exist and work on its physical ground, whereas Price's intangible threads prevail and function only in the eye of the viewer of *Moonlight*. While my threads facilitate and present the transformation of the painting's ground, Price's visualise the seamlessness between the physical and the digital.

Price's painting process see-saws from materialisation to digitisation. He uses a 3D graphics rendering software to create digital images that reflect and interact with the photographic images of the physical world in a convincing way (Wilson & Price, 2024). The computer-generated images are printed and attached to the reflective surface of the painting on aluminium. The outcome is a hybrid world in the form of a physical painting with the appearance of a super-high-resolution digital image

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controlling the screen' (ibid.). Similarly, when standing in front of the Amazon Locker, an electronic locker operated by the online shopping giant through its vast networks, I have no idea what is inside, including my purchased item. Unlike the school lockers, whose access is controlled by individual users, the company has sole control over access to its lockers by screening the user. This idea of control evolved into my discussion about how to address the opaque way that social media controls the context of the online content associated with a painting, which is also elaborated later in this section.

[56] For an image of *Moonlight* (2024), see: https://www.sadiecoles.com/exhibitions/1171-seth-price/works/#/image_popup/image17162/ (Sadie Coles, n.d.).

[57] 'Seth Price' (2024) at Sadie Coles HQ in London.

displayed on a glossy computer screen tilted vertically. As a result, the material ground and the immaterial ground seem to be placed on top of one another in his painting. In this way, Price's painting oscillates between the two grounds, which attract each other, questioning the closer correlation between the two.

In regard to the hybridity of the practice, I recently used Google Lens, Google's online search function via imagery, with the above photograph of *Frankenstein*. Along with other images that resemble the painting in terms of colour or shape, or both, the search engine presented me with an online image of *Interface L3* (2014),[58] which I had not seen for a while. The realisation that the two paintings have already been linked to each other via the internet, beyond my sight and knowledge, has motivated the development of an online proxy for a painting to regain some control over the online representation of my paintings. Like Price's CGI software, the proxy is a tool for connecting the material (a painting) and the immaterial (its digital content), where the thread is invisible, as in Price's works.

The artist Vija Celmins (b. 1938) prepares her canvas through 'building a relationship with it' and in that sense considers she is 'building a painting instead of painting a painting' (Art21, n.d.).[59] Likewise, the painter can turn the internet into the ground for painting. For example, the ground of *Frankenstein* was prepared by building linen offcuts into the sewn canvas. The cloth patches, large or small, take part in the interconnected ground with their own capacities in terms of size, colour, texture, thickness and elasticity. For me, the way the patches jointly support and hold painted images is applicable to their digital counterparts, various online platforms.

The proxy is designed to establish a relationship between a painting and its associated online content scattered across multiple platforms. Woven into the fabric of the internet, it functions as the 'tooth' of the digital ground on which to build up the transforming image of painting.[60] Because this ground is not only edgeless, but also

[58] For an image of *Interface L3* (2014), see: https://www.newcontemporaries.org.uk/2016/artists/seungjo-jeong (New Contemporaries, n.d.).
[59] Celmins explains that she 'start[s] putting coats on the canvas. Just to get to know it and to begin to fill the canvas, building a relationship with it' (Art21, n.d.).
[60] How the proxy works for painters can also be explained by comparing it to the way Whitten used a large squeegee-like tool that the painter had invented and made in the 1970s, using his carpentry skill. Like Price, Whitten adapted technologies that characterised the period to devise a new way of making a painting. As the name of the tool, 'Developer', suggests, Whitten created paintings using the

flexible enough to twist across time and place, layering on the digital ground involves fewer constraints than material layering. Therefore, painters can build a new digital version of their work on the immaterial ground by assembling relevant content available across different platforms and linking the curated content via the proxy, at their own pace, in their preferred ways and formats.[61]

Social media platforms mix our images with their advertisements into endless patchworks of images; through algorithms the companies cover our screens with their preferred logic, which is notably opaque to our eyes (Lanier, 2018, p.80). *Frankenstein* demonstrates a way to make 'the invisible visible' (Obrist, 2018). Threads used in the sewn-canvas painting are meant to be visible because both the comprehensibility of the way I interconnected things with each other and the outcome are the actual subject matter of the painting. *Frankenstein* is my response to 'the seemingly impenetrable screens of the networked world', which contemporary painters, including Jana Euler, are commenting on in their own voices and styles (Stakemeier, 2015, p.265). *Frankenstein*, because it is interconnected with its digital version via the proxy, exemplifies a painting as a hybrid network that operates across the material and immaterial grounds in a seamless way.

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tool in a way that is similar to the development process in photography (Whitten & Shiff, 2017, p.18). When Whitten raked the canvas using the tool, anything underneath the fabric surfaced on the ground in the form of the painted marks. Likewise, the proxy is designed to increase the visibility of the online content relating to a painting that might be hidden or misplaced in the opaque fabric of the internet. However, the proxy is more of a proactive tool than one that responds to existing content. Like the way Whitten chose various objects and organised their placements under the canvas to create a painted image of their marks using the tool – also comparable to the way Price stitches together images that the artist either chose or newly created – the painter can also make new online content and link them with their current selection via the proxy to create a new online image of their paintings.

[61] This is similar to Sillman's strategy of presenting 'the whole history of one painting' with a curated set of digital images in *Temporary Object* (2023) (Art21, 2024).

0.6 Narrative path

I outline here the narrative path of this thesis, which consists of five chapters and three appendices.

Chapter 1: The painting-canvas as a sensuous interface: mapping my programming experience onto painting

From my perspective as a former software engineer and as a practising artist, I compare and contrast a painted surface in a physical painting with a GUI (graphical user interface) in a computer programme. I refer to the artist Gary Hume's remark about a hierarchy of layers in his paintings,[62] which contrasts sharply with the opaqueness of digital interfaces. The internal logic of digital interfaces is hidden, creating opacity in the current online landscape. However, these interfaces prompt the observation that a physical painting and the online content associated with the work coexist in their own forms, which I have used to create an online proxy for a painting in an interrelated structure.

Gilles Deleuze highlights the crucial role of 'rhythm' among bodily sensations in making a painting, which not only affords the painter multisensory experience but also achieves the 'unity of the senses' in a physical painting (Deleuze, 2003, p.42). I have found that the directness and reliability of the 'rhythm' (ibid.) in painting serves the painters in a way that is similar to the way a GUI serves its users. For this reason, I define the painting-canvas as a sensuous interface for the painter. Informed by the writing of the philosopher Richard Wollheim, who highlights the 'multiplicity of roles' for the painter, including that of a viewer (Wollheim, 1987, p.43), I also re-examine the painting-canvas as a 'programming interface' (Cramer, 2011, p.120) for the painter, in comparison to its role as a user interface for the viewer.

The art historian James Elkins laments 'the lack of language with which to describe the nonconceptual experience of painting' (Elkins, 2019, xi). In searching for an alternative language to use to analyse the bodily experience of painting, I test whether a programming language might offer the most appropriate way of describing

[62] Hume asked 'where the hierarchies lie, what is above and what is below' (Morgan et al., 1995, p.45).

my act of painting linguistically, re-examining it through the lens of 'computational thinking' (Wing, 2010, p.1). I translate my painting process into Visual Basic 6.0, an event-driven procedural programming language that was once widely used to develop GUIs. I divide my painting process into three sections: before, during and after painting, and translate each process into Visual Basic.[63] Following Steyerl, who asserts that 'languages of practice' should focus on their own 'form' (Steyerl, 2006), I consider the aspects of my painting process that are not translatable into the programming language as overlooked yet indispensable aspects of the physical practice, such as impromptu changes in the direction of painting while the process is taking place.

Chapter 2: Painting practice in today's post-internet context

The term 'post-internet' was first coined by the artist Marisa Olson in 2008. Considering the internet's continuing influence on painting practice, the term is still relevant today. Given the way that the current online landscape is dominated by major online platforms, it is especially important to reflect on the correlation of today's painting practice with the digital networks.

I observe the way that paintings are currently presented and circulated on the internet. Paintings are being disseminated online largely on image-sharing social media platforms such as Instagram, on which many painters rely to present their work to the widest possible audience. Using these online platforms for the purpose of presentation, however, means acknowledging and addressing an inherent critical problem in terms of the context of user-created content. The computer scientist Jaron Lanier explains how these online platform companies apply context 'to what you say after you say it, for someone else's purposes and profit' (Lanier, 2018, p.63).

Despite this inbuilt limitation of the social media platforms, the internet itself clearly offers a unique capacity that we, as artists, can utilise to restore the context of online content and provide an alternative way of presenting paintings to global audiences. Steyerl asserts that the internet is 'itself a medium' in 'a form of life (and death) that contains, sublates, and archives all previous forms of media' (Steyerl, 2013). It is

[63] The translation of my painting process in the programming language is provided in Appendix II.

therefore necessary to reassess how we use this evolving and flexible medium. Informed by Steyerl's thinking, I developed a way to make visible the interrelation of the online context of paintings by working with the following agents.

Steyerl considers images 'not as passive representations' '[b]ut as entities which are able to act and catalyze actions' (Steyerl & Olunkwa, 2021). We cannot ignore these 'semi-autonomous' 'agents' (Steyerl, 2014) that have 'an uncanny ability to proliferate, transform, and activate' (Steyerl, 2013) because what this means is that online images of a painting can themselves alter the context of the painting when it appears online. Elsewhere David Joselit highlights the notion of 'image power', which means 'that images possess vast power through their capacity for replication, remediation, and dissemination' (Joselit, 2013, p.xiv). Joselit points out that this 'image power [...] is derived from networks' because 'connectivity produces power' (ibid., pp.94-96). For this reason, Joselit suggests that 'works of art must develop ways to build networks into their form' and use a network as their 'ground' in order to exploit their 'image power' (ibid.).

Following Joselit, in order to build up a network for paintings and their context and reframe the internet as the 'ground' of painting (ibid.), I have developed an online proxy for a physical painting. The proxy forms a network of the digital content relating to a painting that is available online in various media formats. The proxy uses the internet as its ground, in the sense that the online content is interconnected via the metadata of the painting through search engines. Lewis Richardson, a mathematician, proposes that 'joints' can be built to 'accommodate and manage heterogeneous elements' (Galloway, 2021, p.130). Informed by Richardson, I have built a *joint* as part of the proxy to connect a painting with its associated online content, made in various media formats. The joint is composed of textual information about a painting and made in a standard format for data exchange to be easily retrievable by search engines, which is elaborated in Chapter 5. The joint connects the online content that is available on different websites and platforms via search engines, regardless of their individual locations. Joselit warns that 'when it enters into networks, the body of painting is submitted to infinite dislocations, fragmentations, and degradations' (Joselit, 2009, p.134). To address these potential issues, the proxy is designed to take the form of a loose constellation of online

content that is only digitally networked by the joint, so that the network is protected against sudden changes to its components.

Chapter 3: The interface for the network of painting practice

I review the process of making the sewn canvas with a sewing machine from the perspective of the social scientist James Ash. Ash considers interfaces as ‘inorganically organized objects’ and as ‘environments made up of the arrangement of objects’ (Ash, 2015, pp.26-29). I arrange and rearrange my painting materials and tools in the studio in a specific way to make a painting. The components of an interface relate to each other with their own ‘capacity’ (ibid., p.31) and collectively form an environment suitable for the interface user to operate the interface. The introduction of a sewing machine into the interface for my painting practice has enhanced the overall capability of the interface, through which I can make the sewn canvas.

Ash explains how the interface works by using the concept of ‘transduction’, which means ‘a process by which objects in interfaces are organized by designers to produce particular qualities for other objects in that interface and for the people using that interface’ (ibid., p.28). The term is helpful to describe the physical process of painting by identifying the materials and tools that are involved in a specific quality at each stage of painting. However, Ash’s concept of transduction is limited by its lack of ability to address a happy accident that occurs unexpectedly during painting. While certain qualities generated by transduction in the interface are the intended outcome of my use of the interface, a happy accident involves different kinds of qualities in the sense that they are produced unexpectedly regardless of the intention of an interface user.

To understand the discrepancy in the qualities produced in painting, I re-examine the happy accident from the perspective of the network theory scholar Bruno Latour. Latour summarises the main characteristics of a network as follows: In a network, ‘action is to be redistributed’ (Latour, 2011a, p.797), and the network ‘is fully dependent on its material condition’ (ibid., p.802). I find my painting practice has a network aspect, in the sense that my action leads to another action, and another,

constituting the progress of the practice, during which the practice is ‘dependent on its material condition’ (ibid.). Latour’s notion of network is useful for tracing a non-linear and unexpected development in painting, such as a happy accident.[64]

Deleuze’s (2003) concept of the diagram helps us to understand the essential role of the painter’s action in opening up ‘the new order of the painting’ (Deleuze, 2003, p.102), by which he means that it is the painter’s action that ‘ends the preparatory work and begins the act of painting’ (ibid.). Although my action of using my painting materials and tools is within the network of my painting practice, the action is not confined by the network’s ‘material condition’ (Latour, 2011a, p.802), as exemplified by my introduction of a sewing machine to the network. In this sense, the painter’s action functions as a hyperlink, which builds new connections within and beyond its current network. The action may or may not access unresolved problems and untapped potential that are undiscovered and yet reside in the ‘holes’ in the network (Galloway, 2021, p.237) of painting practice. I therefore suggest a new term, ‘the interface for the network of painting practice’, from which to think through practice in a hybrid context.

Chapter 4: Painting as a network: the internet as the ground of painting

My 2023 solo exhibition in Seoul explored ideas of paintings operating as networks and as interfaces. I used this exhibition as a platform for digitising my acrylic paintings in multiple image formats, such as photographs, video and 3D scans in order to show examples of an online proxy for a physical painting.

Joselit asserts that painting must be considered in relation to its networks, emphasising that the ‘relevance’ of their inseparable nature ‘has only increased with the ubiquity of digital networks’ (Joselit, 2009, p.125). To consider a painting as a network, I examine the paintings that I made for the 2023 exhibition to see what components the paintings consist of. Bradbury asserts that an exhibition ‘brings together objects, people, ideas, events, and experiences and puts them on display’ (Bradbury, 2018, p.70). In this sense, an exhibition of paintings is also a network in

[64] However, Latour’s notion of the network can describe the trajectory of the development only after it happened, not before. In this sense, the notion is limited in discussing the painter’s possible next actions in response to the unexpected but happy accident.

its own right. I examine how the network of my painting practice was expanded by creating a network of my 2023 solo exhibition. In this regard, Joselit asserts that the art world operates like ‘distribution networks’, which have a structural benefit of ‘a robustness that derives from redundancy’ (ibid., pp.18-19). Following Bradbury and Joselit, I adopt the structure of a distributed network to create an online proxy for a painting so that the proxy is robust against expansion (and shrinking).

While the art world continued operating predominantly online during the COVID-19 pandemic, I participated in an exhibition held in my home country, South Korea. Due to travel restrictions at the time, I was not able to visit the group exhibition in person. Browsing the 3D photographic documentation of the show on the internet, often dubbed as a ‘virtual exhibition’, provided by the not-for-profit art space, I sensed a discrepancy between the paintings I had shipped to the exhibition space via Parcelforce’s transport network and the digital images of them delivered over the digital network. Nonetheless, I was impressed by the immersive quality of a 3D scan format of the exhibition space with my paintings on display, and I wondered how to utilise the capacity of the internet to extend my painting practice online without relying on the usual image-sharing online platforms and popular image formats.

The internet provides a useful environment in which various digital formats can coexist. In search of a digital format suitable for making an online proxy for a painting, I examine whether an NFT (non-fungible token), which exists and operates in the form of a digital network, can be used to make the proxy, on the premise that both an NFT and a painting form a network structure. However, NFTs are essentially nothing about image quality but about ownership of a digital image to which an NFT is linked. Despite this limitation in its format, NFTs that were made based on paintings by Hilma af Klint demonstrate that a physical painting can build reliable connections with multiple digital images by using the capacity of the internet.

I have digitised my solo exhibition in still, moving and 3D image formats. Since each image format has different strengths and weaknesses in terms of containing and conveying the physicality of painting online, I have used multiple image formats together so that they can complement each other. In a similar sense, digitising a painting should be conducted in both image-based and text-based forms. This is

because text-based digitisation is effective at capturing a painting's conceptual content, some of which cannot be digitised in image formats alone. Specifically, text-based digitisation can assemble a painting's physical, conceptual and administrative data. This data, often called 'metadata', is crucial to annotate the image-based online content relating to a painting by informing search engines of more and accurate information about the painting and its relationship with the online presence of the work, which is discussed in the following chapter.

Chapter 5: Painting as network: online proxy for a painting

I use 'interoperability' as a conceptual framework to create an online proxy for a painting. The term is defined as the 'capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units' (ISO/IEC, 2003, p.9). To implement the interoperability of painting online, I use metadata.

Metadata can be described as 'data describing the context, content and structure of records, as well as their management over time' (ISO, 2016, p.4). The theorist Donna Haraway proposes that 'any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language' (Haraway, 1991, p.163). I consider metadata as a 'common language' (ibid.), in the sense that it has already been implemented today on the internet in the form of metadata schema. The metadata schema is a standard format for data exchange that is specifically readable and writable by both humans and machines. In this sense, metadata schema is 'the proper standard' (ibid.) to make the proxy.

I consider the Semantic Web, proposed by the computer scientist Tim Berners-Lee (1994), as a technological framework for building the proxy. According to Berners-Lee, in the Semantic Web, which is today part of the internet (as its extension), 'information is given well-defined meaning, better enabling computers and people to work in cooperation' (Berners-Lee, Hendler & Lassila, 2001, p.37). Berners-Lee and his colleagues highlight both 'machine-readable Web content' and

‘automated services’ as critical for the mutual success of the internet and its users (ibid., p.42).

Paintings are being circulated online in various media formats, including still, moving and 3D images. My online proxy for a painting is designed to annotate the online content relating to the painting with the work’s metadata so that the digital content is ‘machine-readable’ (ibid.) for ‘automated services’, such as online search engines. The painter can make the proxy by organising the structured data of a painting in the form of a metadata schema. The painter can activate the proxy by inserting the metadata into the code of their personal website. Once published online, the metadata can be retrieved and processed by search engines, which then understand the online content associated with a painting based on the information provided. By doing so, search engines can offer the most relevant online content and information about a painting to those who use Google to search for the work.

The proxy connects the online content relating to a painting, via the painting’s metadata, into an online version of the painted work. In this sense, the proxy functions as a hybrid ‘joint’ (Galloway, 2021, p.130) by encompassing a physical painting and its online content that is available in various digital formats. The painter can use the internet as the ‘ground’ (Joselit, 2013, p.94) of painting and exploit the ‘image power’ (ibid.) to disseminate their work to global audiences.

Appendix I: The metadata schemas of ‘“Hello, World!”’ (2023)

This appendix contains the metadata schemas of my 2023 solo exhibition ‘“Hello, World!”’ and the paintings featured in the exhibition.

Appendix II: The translation of my painting process in Visual Basic

This appendix contains the translation of my painting process in a programming language called Visual Basic that I used while working as a software engineer.

Appendix III: Paintings (2018~2023)

This appendix contains images of paintings that I made throughout the research period.

Chapter 1

The painting-canvas as a sensuous interface: Mapping my programming experience onto painting

While working as a software engineer developing computer programmes for a nationwide project to introduce the new address system in my home country of South Korea, I struggled to cope with the suitability of the GUI (graphical user interface) for the individual needs of three different user groups – my company's database team members (a utility programme), local government officials (a management system) and the public (a web service). I made the three computer programmes connected to the same database, but with different GUIs. I used the following GUI components: buttons, windows, scroll bars, option buttons, input boxes and checkboxes. Although the GUIs designed in early 2000 might seem crude by today's aesthetic standards, these components are still in use, as they have been given a periodic facelift. I could have designed new GUIs, but I decided not to. Instead, I followed the convention of retaining the standard GUIs, which was more useful for the programme users because they did not need to familiarise themselves with new GUIs if one they were used to was provided.

I used Visual Studio 6.0, an IDE (integrated development environment)[65] by Microsoft. The IDE had a well-designed UI (user interface) to facilitate the simple, repetitive tasks its users (software engineers) carried out. I was easily able to flip between a GUI design window and a programming code window with just one click while editing both sides, either together or separately. Following Lev Manovich, who suggests that 'behind the screen lives a whole separate world with its logic, aesthetics, and dynamics' (Manovich, 2006), I was intrigued by the idea that hundreds of thousands of lines of complicated code were hidden just behind a simple GUI. This idea of concealment within extreme proximity excited me.

[65] a software application that helps software engineers write computer code effectively

1.1 Painted surfaces vs. GUIs

‘The surface is all you get of me’, Gary Hume (Searle, 1993).

In hindsight, I now consider that GUIs (graphical user interfaces), such as buttons, windows, pointer, scroll bars, option buttons, input boxes and checkboxes, were all that users got from the computer programmes that I made over a decade ago.[66] I mean this not in the sense that I utilised the GUIs in the programmes in a similar way to Hume’s use of the surface in his paintings, but, more specifically, in the way that it was actually the one and only layer (like the surface of the programmes) that the users were able to interact with.

The spatial relation between the GUI and the programme code seems to echo Hume’s question below about a hierarchy of layers in his paintings:

> In my new paintings, there’s underpainting and then a surface layer of paint on top. In a way the underpainting is like the flesh and the surface on top is like makeup. What is the surface and what is the imagined surface? Where is the skin and where is the flesh? I find myself more and more interested in the use of makeup to cover flesh. Discovering where the hierarchies lie, what is above and what is below. How things meet (Morgan et al., 1995, p.45).

The hierarchy between the GUI (skin + makeup) that I was working on and the code (flesh) was uncertain, despite their spatial proximity. From my viewpoint, there was virtually no distance between a GUI design window and a programming code window, as they were just a click away from each other, on the front and back of the same window, like two sides of the same coin. While they coexisted and were interconnected with each other in the same digital environment they did not merge, in the way that paints are indissolubly bound together.[67]

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[66] ‘The commercial introduction of graphical user interfaces [was] in the mid-1980s’ (Andersen & Pold, 2011, p.7).

[67] Based on this idea, I have developed an online proxy for a physical painting in the form of a loose constellation of the painting’s digital content in different formats. The development of the proxy is discussed with examples in Chapter 5.

However, the GUI also has a limitation – it offers no clues about the internal logic of the programme ‘under the skin’. It is ironic that the GUI was originally conceived by ‘designers of computer media’ to be transparent in such a way that ‘the user should have an unimpeded and undistorted view of the information that lies “beyond” the interface’ (Bolter & Gromala, 2006, pp.376-377). Yet in real life, the ‘technological obscurity’ of digital interfaces is almost unnoticeably exploited (Bridle, 2019, p.118).[68] In the context of the previous discussion of the opacity of the internet as evidenced in social media, digital interfaces prevent us from understanding how and for what purpose user-generated content is utilised beyond the bland smoothness of the computer screen.[69]

In contrast, we can appreciate the underpainting beneath the upper layers of paint of Hume’s work in a way that feels similar to feeling flesh under our skin. A painted surface plays a pivotal role in attracting our attention beyond the skin through sensation.[70] Gilles Deleuze suggests that ‘[s]ensation is what is painted’ (Deleuze, 2003, p.35). We experience sensations from a painted surface. The art historian James Elkins also suggests that he feels that ‘[t]he sensations’ ‘from paint come from attending to specific marks and the way they were made’ (Elkins, 2019, p.96). The way a painting works is linked to its construction, i.e., the act of painting.

[68] James Bridle gives a vivid example of how the GUI misleads us: ‘At Uber, a deliberate ambiguity starts in the user interface and pervades the entire operation. In order to convince users that the system is more successful, more active, and more responsive than it actually is, the map sometimes displays “ghost cars”: circling potential drivers who do not actually exist’ (Bridle, 2019, pp.118-119).
[69] Christian Ulrik Andersen and Søren Pold further warn: ‘It is not possible to “unveil” the computer through a deconstruction of the interface. The code behind the interface is just another interface in the layered “mise en abîme” architecture of the computer’ (Andersen & Pold, 2011, p.9).
[70] David Joselit observes that ‘even in the flattest of modernist paintings a spectator's perception and expectation of depth could not be banished’ (Joselit, 2000, p.20).

During a long international flight from London to Washington DC for a group exhibition, I am forced to look at the back of an aeroplane seat in front of me. I notice that the angle of the seat is changing, making it closer and closer to me. I have to adjust my body in relation to it. One of the few ways to kill time in that seat where I can barely stretch my legs is to watch a film on the video screen attached to the back of the seat in front. After the first few hours of the flight, I sense how close the seat back is. The seat makes me feel pain in my back, neck and buttocks, which touch the upholstered seat. After my eyes adjust to the dark of that confined space, crammed with hundreds of other seats, I am surprised by how economy class seats have become smaller and smaller in recent years to accommodate more seats, inevitably maximising airlines' profits. Interestingly, this reminds me of the time when I once considered a stretched canvas as a standardised module and made several identically sized canvases all at once in order to be more efficient in the way I built and stored them. Then it suddenly crosses my mind that I might also be a kind of module on board. When I get up to use the lavatory, I look back at the scene where hundreds of seats are squeezed into a neat grid, lit by the glow of the incessantly blinking screens on the seat backs. This unusual spectacle makes me see the passengers as a set of components in a large, complicated electrical circuit, where the narrow aisles become conduits for the autonomous components. Even the sound of a clicking seat belt as it is fastened further heightens this impression – it sounds like the click that confirms that a new VGA (video graphics array) card has been inserted into one of the PCI (peripheral component interconnect) slots of my PC's motherboard. The distinction between human and non-human has become blurred.

1.2 The painting-canvas as a sensuous interface

James Elkins considers painting to be ‘a bodily art’: ‘It has to do more intimately with the act itself: the muscles that burn after repeated gestures, the thin sweat of constant activity, the rubbing and caressing of paint against paint’ (Elkins, 2019, p.161).[71]

Painting is characterised by the painter’s multisensory experience. Amy Sillman describes that ‘painting *for a painter* is an inherently synesthetic experience that merges the senses of touch, smell, sight, and even sound while the painter makes the painting’ (Sillman, 2020, p.49). This multisensory experience is created by a painter’s physical interactions with painting materials and tools in the studio (Dickens, 2018, p.243).[72] The British painter Cecily Brown (b. 1969) affirms: ‘I think it's unique just through the materials used. Every painter knows that unique set of experiences when you're alone with your pigment and your surface’ (Enright, 2015, p.55).[73] In my case, I prepare my surface for painting in the form of a stretched canvas using wooden stretcher bars, linen canvas and clear gesso. I then paint on it with acrylics, brushes and masking tape. From my physical experience of making and using the painting-canvas, I consider it as a sensuous interface that provides its user, the painter, with multiple sensations.

Gilles Deleuze explains the crucial role of ‘rhythm’, which not only modulates the dynamics between the various sensations but facilitates the ‘unity of the senses’:

> ‘What is ultimate is [...] the relation between sensation and rhythm, which places in each sensation the levels and domains through which it passes’ because ‘the sensation of a particular domain [...] is in direct contact with’ the

[71] Wollheim gives an example of painting’s bodily nature by depicting Willem de Kooning’s painting in which he ‘crams his [canvases] with infantile experiences of sucking, touching, biting, excreting, retaining, smearing, sniffing, swallowing, gurgling, stroking, wetting’ (Wollheim, 1987, p.348).
[72] Pip Dickens argues: ‘The studio set up is in one way designed for optimum sensory activity. [...] Sensory practices may be required to make adjustments through a compensatory “tweak”’ (Dickens, 2018, p.243).
[73] Based on his previous experience as a painter, Elkins makes a claim for paint’s almost voluptuous quality: ‘Paint itself is insistently sensual. It is always sullied and impure, never pristine’ (Elkins, 2019, p.157).

> rhythm, which has ‘a vital power that exceeds every domain and traverses them all’ (Deleuze, 2003, p.42).

Deleuze concludes that ‘it is the rhythm itself that becomes sensation’ (ibid., p.73). To explain how the rhythm operates in painting, Deleuze borrows Paul Valéry’s words: ‘sensation is that which is transmitted directly, and avoids the detour and boredom of conveying a story’ (ibid., p.36). Valéry’s remark echoes the way a ‘good’ GUI functions: it should be ‘intuitive, easy to use, and consistent’ (Bolter & Gromala, 2006, p.376). The rhythm should be direct to ensure and enhance a painter’s rich, sensuous experience. In this sense, as a user interface, the painting-canvas is designed to suit the painter with direct access to the ‘rhythmic unity of the senses’ that facilitates the user’s sensuous experience of painting (Deleuze, 2003, p.44).

While the viewer can also experience sensations from seeing the painting-canvas as a finished work, their sensory experience is more limited than the painter’s. Florian Cramer,[74] a programmer and artist, suggests that, in comparison to the term ‘programming interface’,[75] ‘user interface’ effectively separates users from programmers ‘based on different access privileges to machine functions granted by the respective interface’ (Cramer, 2011, p.120). This distinction is useful to explain a painter’s extended range of roles in relation to the painting-canvas. While both the painter and the viewer are roughly considered as its users, the painter has full ‘access privileges’ to it, unlike the viewer, who would usually be given much more limited access to it, i.e., seeing it as a finished painting only.

Richard Wollheim asserts that a ‘multiplicity of roles’ is required for an artist in the way that ‘an artist must fill the role of agent [...] but he must also fill the role of spectator’, since ‘[i]nside each artist is a spectator upon whom the artist, the artist as agent, is dependent’ (Wollheim, 1987, p.43).[76] The painting-canvas directly involves these multiple roles of the painter. For example, I make it as a painting support, use it as an interface for painting and see it as a painted work. Throughout these

[74] Florian Cramer is a professor in Artistic Research and Emerging Forms of Cultural Production at Willem de Kooning Academy, Rotterdam in the Netherlands.
[75] It is a set of protocols that facilitate communication and access between computer programs.
[76] Joselit asserts: ‘Painting objectifies a fundamental existential question: How can an artist mark the flow of experience, first as a producer (painter) and then as a consumer (spectator)’ (Joselit, 2016, p.14).

processes, my role continues to shift between that of a maker and that of a user, and between that of a painter and that of a viewer. While I am painting, I change roles in a sort of ping pong as I keep shifting back and forth between being a painter and being a viewer. The viewer's perspective on a painting that the painter repeatedly resumes and suspends while painting can be explained by Wollheim's concept of the 'twofoldness' of 'seeing-in' (ibid., p.46). He explains the concept: 'when seeing-in occurs, two things happen: I am visually aware of the surface I look at, and I discern something standing out in front of, or (in certain cases) receding behind, something else' (ibid.). I experience both aspects while being actively occupied with them simultaneously during painting. The shift in my role varies at times. While the shift is mostly between distinct roles, sometimes the distinction becomes blurred.

Deleuze also identifies what a blank canvas contains, before a painter starts to touch its surface: 'everything he has in his head or around him is already in the canvas, more or less virtually, more or less actually, before he begins his work' (Deleuze, 2003, p.86).[77] For Deleuze, even a fresh canvas contains abundant resources, which have been explored by other painters. Similarly, the painting-canvas can be considered as a programming interface that readily serves the programmer, the painter, with the full resources that have been pre-tested by other programmers.

The technology scholar Jenny L. Davis proposes that the affordances[78] of an object 'vary across users and contexts', suggesting that their 'mechanisms' consist of 'request, demand, encourage, discourage, refuse, and allow' (Davis, 2020, pp.83-85). The way the painting-canvas serves the needs of the painter can be re-examined using Davis's 'mechanisms' of affordance to examine (not 'what' but) 'how' the object affords its users. We should first acknowledge that each user of the painting-canvas, whether this is the painter, viewer, curator, collector, critic, photographer, dealer, art handler, or another user, has their own individual needs in using the interface. For example, the resilience of its surface is mainly, if not solely,

[77] Deleuze asserts that 'it would be a mistake to think that the painter works on a white and virgin surface. The entire surface is already invested virtually with all kinds of cliches, which the painter will have to break with' (Deleuze, 2003, p.11).
[78] The concept was coined by the psychologist James J. Gibson (1979).

useful to the painter to enable them to apply paints to the surface.[79] Not all the conceptual and physical resources that are readily available from the painting-canvas engage with how it affords its user, the painter. This is because the interface does not 'demand' and/or 'request', but rather 'encourages' and/or 'allows' the painter to utilise those resources as the user wishes.

Søren Pold, a researcher in digital aesthetics and interface study, asserts that digital interfaces feature 'various and ever-changing appearances', as they 'are made for interaction and thus keep adjusting to accommodate actual users and uses' (Pold, 2005). Like GUIs that can be programmed to suit users' individual needs, each painting-canvas is essentially a custom-made interface for particular uses in painting. As the programmer of the physical interface, I make it not only by adjusting its dimensions but also by changing the surface quality of its ground to actualise my idea of each painting in the best possible way, as described below.

I apply acrylic gesso onto a stretched canvas to make the ground for painting, which serves as an interactive layer between the linen canvas and the acrylic paints during and after painting. The gesso-ed layer of the canvas not only protects its underlying fabric but also ensures that the cloth material is ready to hold acrylic paints both securely and responsively. The stretched, gesso-ed canvas is far from a rigid surface. To work best, it should be taut. If the surface is slack, it is challenging to make a forceful brush stroke on it. If the surface is, conversely, inflexible, it is difficult to spread acrylics lightly over it using the resilience of the surface. Touching a well-prepared canvas with a paint brush feels like typing on a well-made computer keyboard that has a soft and sensitive touch, minimising fatigue for an intensive user who has to make repeated keystrokes. The painting-canvas is a sensuous interface that offers flexibility for the painter to adjust its tautness and surface quality, making the user experience unique in the sense that Cecily Brown asserts that 'unique set of [material] experiences' sets painting apart from other mediums (Enright, 2015, p.55).

[79] In a similar way, when digitising a physical painting, the digital content of the painted work should be prepared to address each (human and machine) user's different purpose of using the content online, which will be discussed in Chapter 5.

1.3 Translating painting into a programming language

James Elkins laments ‘the lack of language with which to describe the nonconceptual experience of painting’ in art history (Elkins, 2019, xi). Elkins observes that ‘Painting is an unspoken and largely unrecognised dialogue, where paint speaks silently in masses and colors and the artist responds in moods’ (ibid., p.5).[80] I echo Elkins’ view in the sense that I struggled to interpret and document the sensuousness of my painting experience in my languages of Korean and English. In this regard, Laura U. Marks, a researcher in haptic visuality, points out the difficulty in translating the sensuousness of art into verbal language: ‘When translating from one medium to another, specifically from the relatively more sensuous audiovisual media to the relatively more symbolic medium of words, the task is to make the dry words retain a trace of the wetness of the encounter’ (Marks, 2002, p.x). Instead of identifying which language would be more suitable than natural language like English to describe the sensuousness of painting, I conducted an empirical experiment to reconsider my physical act of painting in a digital context.

My approach was informed by the perspective of Elkins, who embraced the language of alchemy as a fresh attempt to describe ‘the nonconceptual experience of painting’ (Elkins, 2019, p.xi). In a similar manner, I adopted Visual Basic 6.0, a programming language that I had previously used to develop user interfaces in computer programmes while working as a software engineer. As one of various programming languages in different versions, Visual Basic is categorised as an event-driven procedural programming language (Tabor, 2011). To increase its applicability, I narrowed down my focus to my act of painting on the assumption that it would be the most suitable to describe ‘events’[81] during painting, including making and using the painting-canvas, the painter’s sensuous interface.[82]

[80] Joselit also asserts that ‘we can neither grasp a painting in language nor exhaust it in experience’ (Joselit, 2016, p.11).
[81] The art critic Harold Rosenberg asserted that ‘what was to go on the canvas was not a picture but an event’ (Rosenberg, 1952, p.22). Although Rosenberg’s remark addresses the painting approach of a particular group of artists at a certain moment in art history – Arshile Gorky, Franz Kline, Willem de Kooning and Jackson Pollock, working from the 1940s to the early 1960s – it is applicable to my enquiry into a painter’s bodily interaction with the painting-canvas.
[82] Amy Sillman also highlights that ‘paintings are both things *and* events’ (Sillman, 2020, p.130).

Frieder Nake and Susanne Grabowski, artists working in the field of computer art, assert that 'In programming language, we must spell out everything related to its expressive power. Programming turns mental constructs into executable descriptions to instruct the computer' (Nake & Grabowski, 2006, p.61). For instance, Visual Basic is required to explicitly state a set of procedures in response to each event, e.g., a mouse button click, and even to predetermine how potential errors should be dealt with when they actually occur. Using this 'expressive power' (ibid.) of the event-driven procedural programming language, I interpreted my act of painting into individual procedures executable on a computer.

The computer scientist Jeannette Wing defines computational thinking as 'the thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent' (Wing, 2010, p.1).[83] Taking its divide-and-conquer algorithm as a conceptual framework, I separated my painting practice into several processes. These processes can be grouped chronologically into three stages: before painting (*measuring*, *cutting*, *stretching* and *priming*), during painting (*hanging*, *drawing* and *painting*) and after painting (*storing*, *restretching* and *exhibiting*). I then translated procedures in each process into the programming language and compared my translation with my previous understanding of the process.[84]

```
Public Module Translation

    ' Translate the process of making a painting
    Function TranslateByProcess(ByVal sPaintingName As String) As Boolean

        ' Declare a related variable
        Dim iNumProcess As Integer
```

[83] Based on Wing's conception of the term, Marian Mazzone, a researcher, considers Andy Warhol as 'a model for computational thinking and art-making', as exemplified in the American pop artist's celebrity portraits, which 'were produced with an algorithmic formula of iterative units (photo-based head shots), parameterised in scale, color and texture infill choices, with recursive shape or line decorations on top' (Mazzone, 2020, pp.179-181). Mazzone also understands Warhol's *Flowers* through 'the modularity of computational thinking' (Mazzone, 2020, p.180).
[84] Appendix II contains my translation of the processes in Visual Basic.

```
        ' Count the number of processes for making the painting
        iNumProcess = CountProcess(sPaintingName)

        If iNumProcess > 0 Then
            ' Translate the processes one after another
            For index As Integer = 1 To iNumProcess
                ' Get Nth process of making the painting
                sProcessName = GetProcess(sPaintingName)
                ' Translate the sub-processes of each process
                If TranslateBySubProcess(sProcessName) Then
                ' Continue.
                Else
                    Return False
                End If
            Next
            Return True
        Else
            Return False
        End If

    End Function
```

For instance, my translation of the process of *measuring* in Visual Basic revealed that I did not determine the dimensions of the painting-canvas for a new painting through a formula reflecting the proportional relation between a painting and the subject of the painting. I found myself making the determination case by case, in a rather impromptu way, as exemplified below.

Figure 1A. *Interface AS* (2020) Acrylic on linen, 130 x 50 cm

In determining the dimensions of *Interface AS* (2020), I first took its proportional relation to the size of the subject into consideration. To convey the physical sense of aeroplane seats clustered in economy class, I referred to the actual size of the object, including the seat width and seat height, like Gary Hume's 'door' paintings.[85] The wooden stretcher bars that I used were ready-made and available at fixed intervals of either 5cm (from 25cm to 110cm) or 10cm (from 110cm). Although a stretcher bar of 48cm would fit the width of the seat, the product's limited range prompted me to choose the bars in either 45 or 50cm lengths. Instead of placing a special order for made-to-measure stretcher bars, I played with the size constraint of the prefabricated stretchers. The bar's fixed interval of 5 or 10cm effectively functioned as a grid layout, like a guiding structure on which I relied to design the GUIs of my computer programmes. I tried small differences in proportion of height to width by assembling the stretcher bars, hanging stretchers of various sizes and looking at the frame until I found the one-and-only dimensions for the painting.[86]

Although determining the dimensions of the painting-canvas by mathematical calculation appeared to be a straightforward process, the human factor in the process of *measuring* entails makes the painting process more subjective, and therefore difficult to translate into the programming language.

The following is another example of the untranslatable aspects of painting into Visual Basic. During my *painting* process, I gather tactile information about a painted surface by touching it with my fingertips in order to decide when and how to put masking tape onto the surface so that I can achieve my intended hard-edge shape on the surface. While translating this haptic exploration of the surface into the programming language, I questioned to what degree I could identify and define both the variables and the constants of the tactile quality and the manual procedures of collecting the sensuous feedback. The American philosopher Nelson Goodman distinguishes between analogue and digital by noting that the former is notably

[85] For his door paintings presented at 'Freeze' (1988), Gary Hume famously 'went to St Bartholomew's Hospital with a tape measure and a piece of paper, measured numerous doors and made schematic copies of them' (Manchester, 2002).
[86] As discussed in Introduction in regard to *Preloved* (2022), I chose a slightly off-size to avoid confining myself to that generic dimensional ratio. By doing so, I intended to give the painting's pictorial elements further room for improvisation on the premise that the elements would have their own dynamics and tensions in the pictorial sense.

‘dense’, whereas the latter can be ‘differentiated’ (Goodman, 1976, p.162). Can the ‘dense’ surface texture that I play with while painting be ‘differentiated’ enough to be implemented in the code in the way Goodman identified? Informed by Goodman’s thinking, I recognised the untranslatable aspects of painting.

The untranslatable aspects of painting returned the question about whether the programming language was suitable for examining the act of painting. Steyerl reiterates Walter Benjamin’s assertion that ‘translation primarily takes place within language, not between languages’ (Steyerl, 2006).[87] From Steyerl’s perspective about ‘languages of practice’, the translation of my painting processes in Visual Basic may need to focus, as Steyerl proposes, not on reconstructing the original ‘content’ but on developing a proper ‘form’ for ‘presenting precarious, risky, at once bold and preposterous articulations of objects and their relations, which still could become models for future types of connection’ (ibid.). What I learnt from the translation is not my understanding of the differences between my language of painting and Visual Basic but my interpretation of the code written in the programming language. Its unfinished status is generative in the sense that it revealed several overlooked yet indispensable procedures, which I can work on to enhance the respective processes of my painting practice. I benefited from the language’s instructional nature: it is as if I had left detailed instructions for someone who had no idea of how I made a painting to emulate the procedures.

Through translation in the programming language, I also found the languages – Korean, English and Visual Basic – that I used to describe my painting process themselves were not the only hindrances to examining the non-verbal aspect of my painting practice. As exemplified above, I was able to discover some limitations of computational thinking as a lens to observe sudden, unexpected and subjective changes while I was painting. To further examine this unpredictable aspect of the practice, I also adopted the notions of networks and interfaces as a new conceptual framework, which will be elaborated on in Chapter 3.

[87] Steyerl responds here to Benjamin’s 1916 text ‘On Language as Such and on the Language of Man’.

Chapter 2

Painting practice in today's post-Internet context

2.1 Social media

The convenience, speed and ease of using image-sharing social media platforms, such as Instagram, on a portable device is an irresistible tool for many painters to use for presenting their work to global audiences, curators, gallerists and potential collectors (Kang & Chen, 2019; De la Puente et al., 2022). However, we should be cautious about using social networking services for the purpose of self-promotion.

The theorist and activist Tiziana Terranova points out that 'there has been a significant shift from the internet as a set of interoperable network protocols'[88] to 'a complex of privately owned online services that called themselves "platforms"' (Terranova, 2022, pp.7-8). Departing from the original design principles of the internet, such as 'tolerance' (Berners-Lee, 1998), these commercial companies set their own rules, within which the platforms operate for their own benefit. The art critic Isabelle Graw warns that 'social-media platforms are not innocent or neutral tools' in the sense that 'they want us to perform our life online so that it can be further marketed by them' (Graw, 2018, p.299). The researcher Kate Eichhorn explains that 'every image posted on Instagram generates data that can in turn be put to work for purposes that have nothing to do with the content of these original images and videos' (Eichhorn, 2019, p.127). The manoeuvring of social media companies against us, their users, that is carried out behind their user-friendly but opaque user interfaces has negative consequences on our digital life.

Hito Steyerl warns of 'distorted realities on social media' (Steyerl & Basar, 2019). Specifically, the scientist and philosopher Jaron Lanier points to how social media 'mashes up [the] meaning' of 'what you say' for 'someone else's purposes and profit'

[88] Semantic interoperability on the Internet is discussed in Chapter 5 in relation to my development of an online proxy for a physical painting, which aims to regain some control over the painting's context.

(Lanier, 2018, p.64). Lanier explains its internal logic: its algorithm 'replaces [our] context with its context' by distinguishing us not as 'a name […] but [as] a number: the number of followers, likes, clicks, or other measures of how much [we] contributed to [it], […] 'moment to moment' (ibid., p.65). In this way, social media engineers the context of its users' content, which affects the way in which we present ourselves online.

In the most recent example of this manipulation, Instagram pushed users of its static image format to try its newly introduced short video format, Reels, as its own attempt to catch up with its main competitor, TikTok, a video-based social media (Rodriguez, Bobrowsky & Horwitz, 2022; Cucu, 2023). Gabrielle de la Puente and Zarina Muhammad, of The White Pube, a UK-based collaborative art criticism practice, have expressed concerns about Instagram: de la Puente observes that it incentivises painters 'to basically become process artists and action artists' by recording 'themselves doing the painting' only because video content 'will be seen by potentially tens of thousands of more people than the static studio shot of' the painting (De la Puente et al., 2022). Muhammad has pointed out that Instagram was even 'affecting the way paintings look', which was demonstrated by the increasing number of square-shaped paintings when the platform's 'primary aspect ratio for images' was square (ibid.).

The awareness among painters of these continuing issues was not widely publicised until some of its artist users, led by the British painter Matthew Burrows (b. 1971), jointly attempted to migrate from Instagram to a different social media platform, Vero, in the summer of 2022 (Gorny, 2022; Worrall, 2022). At that time Vero was seen as Instagram's potential replacement on the basis that, unlike Instagram, it had neither advertisements nor algorithms that would manipulate its users' feeds (ibid.). However, these artists' collective attempt to reassert some control over the context and image format of their work by undertaking this digital migration appears to have been unsuccessful, based on the fact that they abruptly returned to Instagram within days of their departure in response to ethical questions about Vero (ibid.).[89] The

[89] Artist Support Pledge (ASP), a not-for-profit company founded and led by Matthew Burrows, explained the decision to withdrawal on an Instagram post (See: https://www.instagram.com/p/Cgw6tgYI40I)

incident nevertheless demonstrates the necessity of developing an alternative, less platform-dependent, way for painters to present their work online while preventing the work's intended context from being replaced with others.

On social media, 'we see less than ever before of what others are seeing' (Lanier, 2018, p.80). One of the practical problems caused by this 'opacity' is that, for example, I have no idea how many images of my paintings are available on Instagram, although I am the artist. I cannot even locate some of those images on the platform unless its users voluntarily tag me or use hashtags, such as #seungjojeong, properly in their Instagram posts as a courtesy to me as the artist, which acts as a tracking device.

Moreover, the company has exclusive power to show images of my paintings in the feeds of the users it chooses, at the times it chooses. It exercises this significant power over me, the artist, facilitating unexpected encounters with photos of my own work, previously unseen by me, in my feed, with rather poor timing. For this reason, using social media as an online exhibition platform would be like working with a curator (the feed algorithm) with whom I share no curatorial ideas, and placing my paintings next to and alongside other art forms, non-art imagery, such as landscape, news, surveys or advertisements, etc.

Lanier laments that the 'foundational idea' of the internet is that 'provenance is valuable' (Lanier, 2013, p.245). Lanier explains the technological framework required to realise this idea: 'In a network with two-way links, each node knows what other nodes are linked to it. That would mean you'd know all the websites that point to yours [...] Two-way linking would preserve context' (ibid., p.227). Lanier points out that the lack of 'two-way links' in the digital network has meant that creative contributors to the network – painters in this case – have not been properly credited (ibid., p.245).

Eichhorn asserts that 'the ability of private companies to exploit users' online interactions and creativity (i.e., their content) will drive the success of the digital economy (Eichhorn, 2022, p.50). For this reason, social media platforms deliberately foster interconnectivity among their users in such a way that '[c]ustomized feeds

become optimized to “engage” each user’, ‘leading to addiction’ (Lanier, 2018, p.31).[90] And yet there is, ironically, no feasible way for today’s painters to build authorial links between themselves and reproductions of their paintings on image-sharing social networking platforms.

Lev Manovich asserts that ‘it is the [digital] work’s interface that creates its unique materiality and the unique user experience’ (Manovich, 2001, pp.66-67). Although recently developed digital image formats, such as 3D scanning, which is used to convert a physical exhibition into a ‘virtual exhibition’, may offer a more realistic experience of the physicality of painting in comparison to its digital photographic image, any digital content entails unique digital materiality, which is mixed with the physical materiality of its original source – the analogue painting.[91] Specifically, users of photo- and video-sharing social networks can post photographic images of the same painting customised in their own styles using various built-in digital interfaces, such as Instagram’s photo and video filters.

Social media users’ proactive participation unintentionally obscures a painter’s position as the author of a work in digital versions of it that proliferate on online image-sharing platforms. The artist and writer Brad Troemel (b. 1987) argues that ‘users of social media are able to more powerfully define the context (and thus the meaning) of an artwork’ (Troemel, 2015, p.39). For example, an Instagram post containing images of a painting is viewed as digital content created by the user of the digital medium,[92] regardless of who the author of the source material is. User-generated content published on online platforms is effectively considered to be a digital work in its own right. As a result, there is always the possibility that artists are not appropriately credited with their own paintings in public posts on social media platforms, whereas the platform’s users are automatically credited with the digital content that they have created, based on the artist’s work.

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[90] Instagram introduced an ‘algorithm-based personalized feed’ in 2016 and, after wide criticism, brought back a chronological order feed as one of three options for users to choose in 2022 (Isaac, 2016; Mosseri, 2022). However, the chronological order cannot be set as a default for the feed option.
[91] For example, the unique physicality of acrylic painting on a gesso-ed surface of linen canvas derives from the materials used in the work.
[92] Manovich highlights that ‘the phone screens and Instagram app interface’ define ‘the specific characteristics of [the] Instagram medium’ (Manovich, 2017, p.109).

Given these commercially driven limitations of the ‘participatory media’ channels, it has become necessary for the contemporary painters to consider an alternative means of presenting their work to global audiences via the internet. It should be less dependent on the platform companies, but should ideally be a means that is more reliable for publishing digital content that the artist creates based on their paintings, along with an appropriate context for them as artworks, in the artist’s preferred format.

2.2 Post-Internet

The artist Marisa Olson (b. 1977), who coined the term ‘post-Internet art’, suggests that ‘the future of Post-Internet Art is reflected in immersive media’ as ‘we are moving away from browser-based networked experiences and toward immersive experiences’ (Olson, 2021). Following Olson, painters must think about how to manage the unstable coexistence of physical paintings and the digital versions of these that are made in diverse media formats, including 2D, moving and 3D images, in today’s post-Internet context.[93]

Olson first used the term ‘post-Internet’ when describing her own art practice during an interview in 2008. ‘[W]hat I was making was “art after the internet.” [...] I said that both my online and offline work was *after the internet* in the sense that “after” can mean both “in the style of” and “following”’ (Olson, 2011, p.60). Olson continues, ‘Art after the Internet is self-referential. It intentionally invokes the Internet, whether with regard to its form, content, or aesthetics’ (Olson, 2021). Michael Connor[94] summarises that ‘the term “post-internet” suggests the focus of a good deal of artistic and critical discourse has shifted from “internet culture” as a discrete entity to an awareness that *all* culture has been reconfigured by the internet’ (Connor, 2015, p.61). The term attracts pejorative reactions, too. Omar Kholeif[95] considers ‘the framing of “post-internet” art as myopic and very market and trend driven’, and instead suggests the notion of a ‘post-digital condition’, which is ‘a milieu where we are aware that digital technologies have become ubiquitous in every single part of our cultural formation […] a digitally induced, networked culture’ (Kholeif, 2020, p.278). Kholeif interprets ‘post-internet’ as ‘a condition that is symbiotic with the existence of the internet’ (Kholeif, 2023, p.68).

Kerstin Stakemeier[96] considers that the context of contemporary painting practice has been changed by the emergence of digital networks. ‘Within the framework of the network’, Stakemeier asserts, ‘painting is no longer burdened by the weight of its own history but can be brought into play as a token, a history-laden wager, within

[93] Hito Steyerl asserts that: ‘reality now widely consists of images [...] [and] one cannot understand reality without understanding [...] [various] forms of moving and still image’ (Steyerl, 2013).
[94] Michael Connor is a co-director of Rhizome, a non-profit organisation promoting new media art.
[95] Omar Kholeif is a writer and curator at Sharjah Art Foundation in UAE.
[96] Kerstin Stakemeier is a professor of art theory at the Academy of Fine Arts Nuremberg, Germany.

today's boundless image production' (Stakemeier, 2015, p.262). I echo Stakemeier's view that the internet liberates painting so that the medium can play with its rich history in the form of online images, but my focus is on how the digital network challenges the medium's authorship, materiality and presentation to viewers.

Isabelle Graw asserts that authorship of painting is unique among art mediums: 'Regardless of its depiction or reference, a painting will be perceived as a physical manifestation of its absent author' (Graw, 2015, p.260). Graw points to 'painting's specific indexicality', which means that the painter's 'labor and lifetime seem to be contained in it' (Graw, 2016, p.82). However, on the internet, like everything else, painting is being ghosted. Lanier points out: 'Online, we often have little or no ability to know or influence the context in which our expression will be understood' (Lanier, 2018, p.63). As discussed in the previous section, paintings are consumed online as an ingredient of user-generated content on social media, often without being given a proper context as artworks. Lanier suggests that 'the internet was supposed to bring about a transparent society' but 'the reverse has happened'. He warns that 'The opacity of our times is even worse than it might be because the degree of opacity is itself opaque' (ibid., p.80). While we are increasingly concerned about the way social media companies deliberately obscure the original context of our expressive work and profitably exploit our content on their platforms, no one has yet suggested a workable solution to solve this ongoing problem, other than to stop using these popular online services.[97] It is therefore both timely and necessary for today's painters to reconsider the way they currently rely on social media platforms for the presentation of their painting practice to global audiences, and to find an alternative.

Despite the opacity of the internet, the digital network also has the potential to resolve the problem. Steyerl asserts: 'Networked space is itself a medium [...] It is a form of life (and death) that contains, sublates, and archives all previous forms of media' (Steyerl, 2013).[98] Steyerl concludes: 'The all-out internet condition is not an interface but an environment' (ibid.). In this sense, the internet should not be seen as

[97] Jaron Lanier urges us to delete our accounts on social media (Lanier, 2018, p.2).
[98] Patrick Jagoda echoes Steyerl's perspective, adding: 'Computer networks have made possible myriad new cultural and art forms, across different scales' (Jagoda, 2016, p.182). Stakemeier also suggests that 'a networked understanding of painting that incorporates the medium into an all-encompassing digital mediation' (Stakemeier, 2015, p.264).

a user interface in a fixed form, like a web browser, but rather as an ever-changing environment bustling with content in various forms, including old and new art mediums, in a state of flux through the network. It is imperative that painters embrace this state of flux to identify and address the dissonance between a physical painting and its online representation.

2.3 ‘Image power’

Jennifer Chan (b. 1988), a media artist, summarises that post-internet art practices ‘are characterized by hybridity and hyper-mediation of existing genres, platform-oriented activity, slippage between formal output of digital and physical environments, and tactical web surfing’ (Chan, 2015, p.110). I observe this hybridity of contemporary painting practice in terms of addressing the increasing tension between a physical painting and the online digital images of the painting in question.

Hito Steyerl suggests that ‘image and world are in many cases just versions of each other. They are not equivalents, however, but deficient, excessive, and uneven in relation to each other’ (Steyerl, 2013).[99] Steyerl’s assertion is applicable to the relation between a physical painting and online images of it. These are generated in various image qualities and digital media formats by individuals with different intentions. Despite the apparent discrepancy between the two versions, a painting is being understood and consumed by its online viewers based on on-screen versions of the work, many of which are not given the appropriate context for an artwork. Each of the images represents, and misrepresents, the painting in an arbitrary way that is beyond the artist’s control, as discussed earlier in the case of image-sharing social media.

The online version of a physical painting is multiplied, diversified and circulated because images have ‘acquired an uncanny ability to proliferate, transform, and activate’ (Steyerl, 2013). The art historian David Joselit has called this ability ‘image power’, which means ‘that images possess vast power through their capacity for replication, remediation, and dissemination at variable velocities’ (Joselit, 2013, xiv). Joselit and Steyerl both suggest that the proliferation of images is based on, and driven by, networks. Joselit suggests that ‘image power [...] is derived from networks rather than discrete objects’ because ‘connectivity produces power’ (Joselit, 2013, pp.94-96). Steyerl describes images as ‘nodes of energy and matter that migrate across different supports, shaping and affecting people, landscapes, politics, and

[99] Steyerl asserts that ‘the gap between them gives way to speculation and intense anxiety’ (Steyerl, 2013).

social systems' (Steyerl, 2013). This 'image power' appears volatile, but irreplaceable for disseminating paintings to global audiences online.

To exploit this ever-growing 'image power' for art practice, Joselit suggests that 'works of art must develop ways to build networks into their form by, for example, reframing, capturing, reiterating, and documenting existing content – all aesthetic procedures that explicitly presume a network as their "ground"' (Joselit, 2013, p.94). Joselit's idea of using a network as the 'ground' of painting draws our attention to ways of utilising the capacity of the internet to deal with online versions of a physical painting that are being generated by, and jumbled in, the digital network.

If we interpret the 'ground' as generally meaning 'an area of space', this could extend to the expanding realm of the internet. In the context of painting, it would then be associated with supports, i.e., ground (such as gesso-ed layer) and support (a combination of canvas and stretchers). The ground of painting is a physical layer designed to hold painted layers, to be accumulated on the canvas in an exact order while protecting the support from direct contact with paints. To do so, the ground should provide what is called 'tooth' for colour pigments to cling to the support and maintain the integrity of the pigments.

In this sense, the pervasive opacity of the online environment in terms of the context of user-generated content seems to be blunting the 'tooth' of the internet on which painters could rely to host their paintings online, to establish their context and to reach a wider online audience through their 'image power'.

2.4 Joint

Steyerl recognises images ‘not as passive representations’ but ‘as agents’, specifically ‘as entities which are able to act and catalyze actions’ (Steyerl & Olunkwa, 2021). Building a reciprocal relationship between a physical painting and online images of the painting is a starting point for the painter to regain some control over the way those ‘agents’ affect and shape the online presence of the artwork.

By combining Joselit’s (2013) idea of ‘image power’ created by connectivity and Steyerl’s (2014) idea of images as ‘semi-autonomous actors’, I have built an online proxy for a physical painting. Based on Joselit’s idea of forming networks in artworks, the proxy is made in the form of a network of online content to utilise the ‘image power’ of painting for online circulation (Joselit, 2013, p.94).

Lewis Richardson offers a conceptual framework for creating the proxy, arguing that ‘joints’ can be built to ‘accommodate and manage heterogeneous elements’ (Galloway, 2021, p.130).[100] Following Richardson, I have developed the joint in the form of a digital format. Joselit highlights the structural benefit of a digital format, which can accommodate ‘all previous forms of media’ (surely including analogue painting and potentially anything), differentiating formats from mediums: ‘a format is a heterogeneous and often provisional structure that channels content. Mediums are subsets of formats’ (Joselit, 2013, p.52). The joint embodies the capacity of the digital network to both accommodate and exploit all kinds of images of a painting online.

The joint functions as a hybrid interface between a physical painting and its associated digital content. The digital format that I used to make the joint is a metadata schema, which will be discussed with examples in Chapter 5. Simply put, this is a standard format for data exchange that is designed to be readable and writable by both humans (e.g., painters) and machines (e.g., online search engines). The joint in the form of a metadata schema is a key component of the proxy, as

[100] Galloway explains Richardson’s idea: ‘Joints bridge the low-resolution zones of the wilderness or the open ocean and the high-resolution zones of cultivated areas and land masses’ (Galloway, 2021, p.130). Galloway then asserts that ‘This same technique is evident in today’s digital networks, where high-volume “backbone” cables are joined, via switches and routers, to low-volume “capillary” channels’ (ibid.).

follows. The joint will contain the information necessary to convey the physical and conceptual aspects of a given painting as a companion to online images of the painting. By retrieving and processing this information in an automated way, search engines can better understand the relationship between the painting and the online content, and offer their users the most relevant content and information about the painting on behalf of the painter. In this way, the proxy can be used as a proactive tool for painters to contextualise the online presence of their paintings.

Joselit suggests: 'when it enters into networks, the body of painting is submitted to infinite dislocations, fragmentations, and degradations' (Joselit, 2009, p.134).[101] In the context of the internet, Jaron Lanier warns that 'Mashups of fragments [...] obscure the context and authorship of each fragment' (Lanier, 2010, p.46). The joint is effective for managing a painting's online images and their potential fragments as the components of an online proxy. With the help of search engines, it can connect digital versions of a painting that share the painting's metadata, regardless of whether they are located apart from each other in the digital sphere. Since the proxy exists online in a loose constellation of online content, communicating with each other via search engines, it is designed to facilitate the changes in its components, such as a sudden drop in its current content and the introduction of a new one. In this way, the proxy acts as an autonomous online network run by the joint in collaboration with search engines on the painter's behalf, embracing the different dynamics of a painting and its digital content in diverse formats and timings.

[101] Joselit highlights that the 'procedures of abstraction [...] characterize the digital network's translation of cultural artifacts into code' (Joselit, 2009, p.134).

Chapter 3

The interface for the network of painting practice

3.1 Interface for painting practice

Interfaces as objects

James Ash[102] suggests that 'interfaces are sets of objects that continually encounter one another and generate particular qualities that are partially dependent on these encounters' (Ash, 2015, p.28). Informed by Ash's assertion, I consider my painting materials and tools[103] as objects that make up an interface for my painting practice. Ash identifies generative patterns in the interface as examples of 'transduction',[104] which means 'a process by which objects in interfaces are organized by designers to produce particular qualities for other objects in that interface and for the people using that interface' (ibid.). I examine what occurs in the interface for my practice through Ash's lens of transduction, which can be summarised in the following three points:

1) Transduction occurs between the painting materials and tools. For example, one can recognise a transducing process between a sheet of linen and a wooden stretcher. When stretching the cloth over the frame, the encounter between the two objects produces certain qualities, including the tautness of the canvas. The painter can make use of the resilience of the stretched surface when applying acrylic paints to the canvas during painting. Transduction also affords another quality by enabling a sheet of fabric to be made into a rectangular prism (a cuboid) with a depth of approximately 3.6cm: I use a deep stretcher to obtain this appearance, in order to highlight the 'objectness' of the canvas painting.

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[102] James Ash is a professor of Technology and Society at Newcastle University, UK.

[103] linen canvas, wooden stretcher bars, mallet, staple, stapler, plier, acrylic transparent gesso, hammer, paper palette, ruler, graphite pencil, eraser, masking tape, palette knife, acrylic colours, paint brush

[104] Transduction takes different meanings and connotations in different disciplines. Ian Damerell, an artist and curator, explains: 'In semiotics, transduction is the translation from a sign or concept from one field of knowledge to a different one, involving a transformation that keeps an original connection in its phenomenological deepest level' using an example of Rene Magritte's (1929) famous pipe painting in which transduction is 'used to destabilise modes of understanding that were traditionally dominant' (Damerell, 2015, p.41).

2) Not every transduction between the objects remains clearly visible, even to the painter, after it occurs. For instance, multiple encounters between a pencil, ruler and stretched canvas take place during preliminary drawing on the canvas. Most of the outcomes of the transductions, i.e., straight lines of graphite powder marked on the surface of the canvas, will probably be covered with acrylic paint while the canvas is painted.[105] Nevertheless, the transduction is an effective means for the user of the interface to make straight lines in the preliminary drawing on the canvas, creating a distinct visual quality on the surface.

3) As can be seen in a series of encounters between the canvas, masking tape, paint brushes and acrylic paints during the painting process, a number of transductions occur either sequentially or concurrently between objects in an interface. Ash emphasises that, in transduction, 'both object and encounter are organized in such a way to attempt to produce a particular quality that is desired by the designer' (ibid., p.29). In this sense, the notion is useful to identify the direct correlation between objects that are purposefully arranged by the painter and qualities that are produced as a result of the transducing process. For instance, the adhesive paper tape plays an irreplaceable role in creating hard-edge lines in the form of painted layers by guiding the liquid colour on the surface of the canvas. I put the tape and the other objects together in this way to generate that specific visual and textual quality, which is otherwise hard to obtain.

Interfaces as environments

Ash also considers 'interfaces [...] as environments made up of the arrangement of objects and the transductions that occur between these objects' (ibid.). Regarding what kind of environment the interface is, Ash gives an example of Unity, a popular development engine for creating video games, in which 'an environment [can be] constructed through creating and overlaying objects and providing them with components, such as position, rotation and scale' and 'each object [...] only selectively encounters other objects through transductions that disclose specific qualities' (ibid., pp.29-30). In this sense, the interface is a controlled environment in

[105] I arrange relevant objects in such a way to create the mechanically produced appearance of my chosen subject, e.g., school lockers, in my hard-edge painting.

which its designer plays a governing role in the way each object in the environment interacts with the others to produce the intended quality by transduction.

Since I put together my painting materials and tools in a specific order to make an interface that can facilitate transductions to ‘produce particular qualities’ for testing and realising my painting ideas, the interface is an environment dedicated to my painting practice (ibid., p.28).[106] Ash further elaborates that ‘interfaces are actual environments; they are ecologies of objects, each of which has their own reality and capacity for relation with other objects’ (ibid., p.31). The idea of an interface in which painting materials and tools relate to each other to create an ecological environment to make physical paintings was helpful for examining my complete reliance on the global supply chain for painting from the perspective of material sustainability.

I examined what kind of ‘arrangement of objects’ can form an environment suitable for increasing material sustainability in my painting practice (ibid., p.29). Until I unexpectedly experienced constraints on the supply of painting materials during the global COVID-19 pandemic, I had no interest in making use of linen offcuts, a common by-product of my painting process. I also had no idea how to put the fabric patches together to make a stretched canvas within the ‘capacity’ of the component objects in the interface for my painting practice (ibid., p.31). However, fiddling with scraps of linen to find a way to use them for painting eventually led to a simple revelation. As seen in its construction, linen cloth, regardless of size, can be sewn in the same sense that a sheet of linen is an outcome of a weaving process whose material is sewable. The offcuts were actually reusable for making a stretched canvas if I was prepared to embrace the noticeable difference in the appearance of my new canvas, which would feature sewn lines on its surface. To put together the small pieces of linen, I decided to introduce a new object, a sewing machine, into the interface for my painting practice that offered the benefit of speed, accuracy and practicality.

[106] I consider my painting studio to be part of the interface of an environment dedicated to my painting practice. Cecily Brown highlights: ‘Every painter knows that unique set of experiences when you're alone with your pigment and your surface’ (Enright, 2015, p.55).

Figure 3A. Using a sewing machine to connect linen offcuts

Transductions in the interface for painting

The introduction of a sewing machine into the interface for my painting practice led to a fresh encounter between the electrical machine and the linen offcuts followed by other encounters, such as one between machine-sewn cloth and a wooden stretcher. A question can be raised about whether this development in painting diverges widely from the customary trajectory of making paintings. However, Nigel Whiteley[107] asserts: ‘The idea of a strongly linear development in the creation of an [artwork] is undermined in [...] the uncertainty, sideways moves and apparent back-tracking which were probably far greater than most spectators would ever have imagined’ (Whiteley, 2007, p.224). In order to understand and enhance the process of painting through the lens of transduction, a more important question to be investigated here is

[107] Nigel Whiteley is a professor of Visual Arts at the University of Lancaster, UK.

what qualities new transductions involving the sewing machine have brought to the painting practice.

Figure 3B. Stretching a machine-sewn cloth onto a wooden stretcher using a staple gun

Among the qualities generated by transductions engaging the sewing machine, the stretchable (and resultant visual) quality of the sewn cloth that I made with linen offcuts is most intriguing to me. Ash highlights that ‘transduction is a two-way process’, explaining: ‘The qualities that emerge from a transduction are [...] partly determined by the interplay or relation between [...] objects, but also partly determined by the qualities of [...] objects themselves’ (Ash, 2015, p.29). The sewn cloth is a good example of Ash’s ‘two-way process’ of transduction in an interface (ibid.). Regarding the innate quality of a component object in an interface, one direction of linen cloth – either the vertical or the horizontal one (the warp or the weft) – is usually more stretchable than the other due to the woven structure of the cloth. Depending on the direction of the scraps of linen sewn by machine, the elasticity of the sewn cloth varies widely. This dynamic quality comes from the interaction between linen offcuts interconnecting in the sewn cloth. As a result of these

combined qualities of the sewn cloth, I feel unpredictable tensions in varying degrees each time I pull an edge of the sewn canvas. Ash points out that ‘objects can work [...] to link the qualities transduced by inorganically organized objects to particular bodily sensations and states to create experiences the designer intends’ (ibid., p.43). Setting aside the tactile pleasure of stretching the cloth with my fingers, it is important to note that the tensions eventually shape the appearance of the canvas, as shown in the image below. This visual quality, which is pronounced across the surface of the canvas, thus becomes a new factor in choosing how much and in which direction I pull each edge of the sewn cloth over the wooden frame while stretching the canvas.

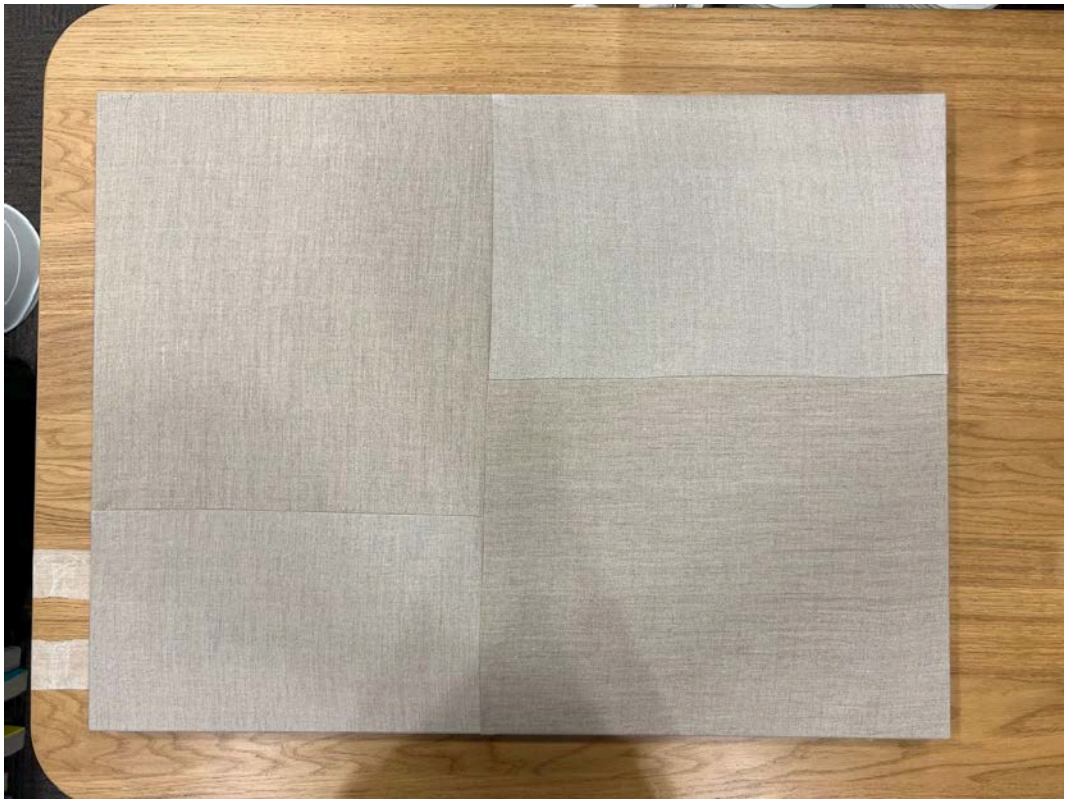

Figure 3C. A sewn canvas stretched on a wooden stretcher

As shown in the above image, sensory stimuli from the seams that spread across the surface of the canvas appear greater when the lines are not straight but bent and twisted as a result of stretching the sewn cloth manually on the stretcher frame. The sensuousness of the curved stitches offers a certain quality that prompts the painter to embark on haptic exploration over the support for painting towards making a pictorial connection between painted images and the scars on the surface.

In this way, transductions initiated by the introduction of a sewing machine into the interface for my painting practice enabled me not only to resolve practical issues in painting but also an unexpected chance to encounter a happy accident, as follows.

3.2 Happy accident

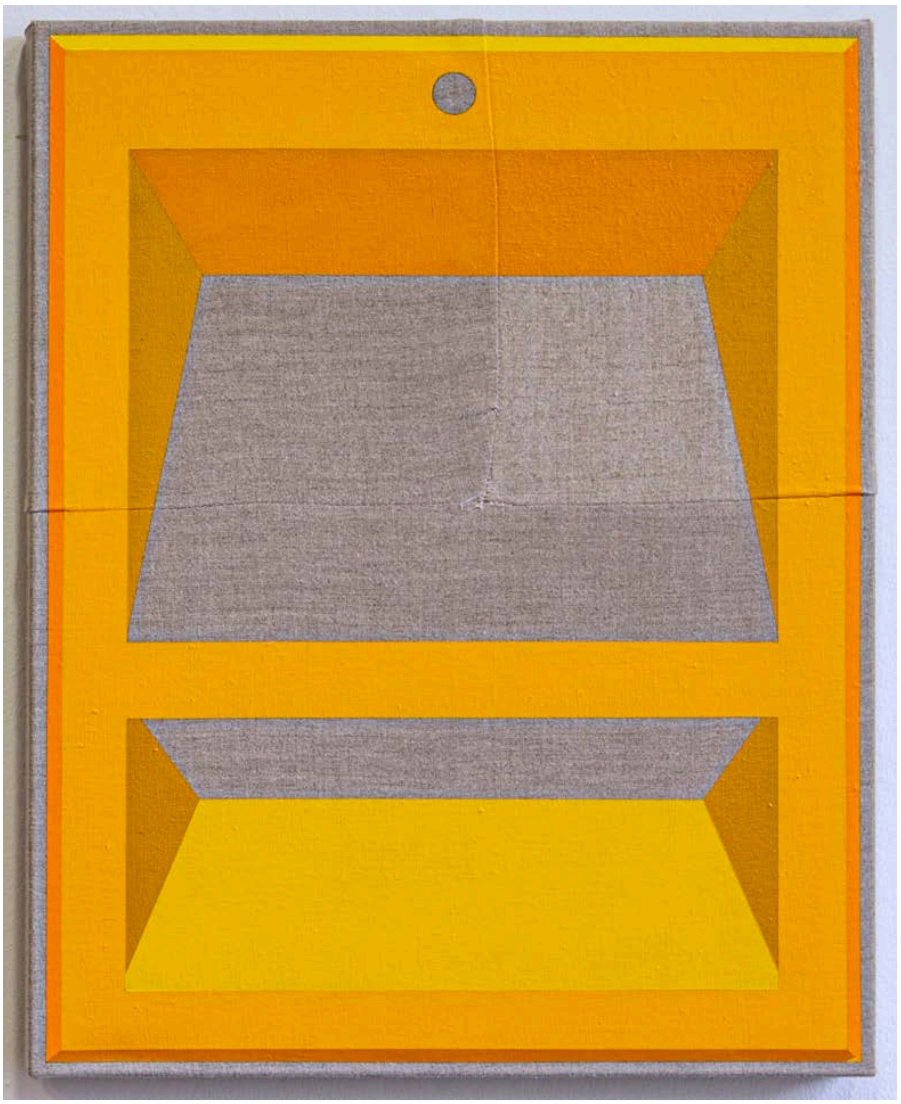

Figure 3D. Detail of the left panel of *Mirage I* (2022)

After finding loose stitches in the centre of the left side of the canvas of *Mirage I* (2022), as shown in the image above, I was attracted to the poor – but fortuitous – stitch quality that was the result of my clumsy use of the sewing machine. Responding to the sensuous quality, I repositioned myself so that I could reproduce this happy accident by imitating my poor sewing skills for a new painting, like many artists who decide to turn their mistakes into a new element for their work instead of covering them up.

Ash considers ‘interfaces as compositions of objects, each with their own realities and capacities’ (Ash, 2015, p.31). Ash’s notion of interface is useful to examine what caused the happy accident. It happened while I was stretching the sewn canvas. This was mainly because I pulled the sewn cloth over the wooden stretcher beyond the limit of some of the seams in the cloth. That action caused the fragile stitches on the cloth to come loose or break, and the seams opened up. In an interface consisting of linen offcuts, polyester thread, sewing machine and wooden stretcher, each object has its own capacity that contributes to the durability of the stitches and the stretchability of the sewn cloth. The dynamics between the components of the interface, each of which has a different capacity, shapes the outcomes of using the interface.

However, Ash’s notion of the interface is also limited in explaining the happy accident. Ash asserts that ‘objects can work [...] to link the qualities transduced by inorganically organized objects to particular bodily sensations and states to create experiences the designer intends’ (ibid., p.43). Although I enjoy the visual and tactile sensations of seeing and touching the broken stitches on the sewn canvas, it was not my intention to create the sensuous qualities. The qualities with which I am satisfied were made unexpectedly, regardless of the intention behind my action that happened to produce them. This reveals a difference between qualities generated by transduction (intended outcomes) and happy accidents (unintended but favourable outcomes), although both are initiated by the action of the painter.

Nonetheless, their relationship in painting is hardly negative: on the contrary, they are beneficial to each other. While the former represents the painter’s individual painting language, that is reliable and available to hand, the latter offers the painter a chance to reconsider their habitual language and potentially develop a new one. In this sense, I would assert that painting involves finding a balance between the two on the premise that each can play a unique role in the creation of a new painting.

Another difficulty in discussing a happy accident that occurred during the painting process is its highly subjective nature. In other words, any action in the process of painting, a chain of actions, could have been called a trigger for a happy accident,

depending on the painter's own perspective at each stage. More than all the painting materials and the tools involved in painting, it is the painter's action that plays a crucial part in facilitating and identifying a certain quality that can be considered to be a happy accident.

Bruno Latour's notion of the network can help us identify the painter's actions when correlating with a happy accident that occurred while painting. Latour asserts that: 'action is to be redistributed' in a network (Latour, 2011a, p.797). My attempt to make use of linen offcuts unfolded to another action and then another throughout my painting practice. The initial action led to my introduction of a sewing machine into the practice. My goal of using up the leftover scraps of fabric for painting was successfully achieved, but maybe too quickly from the point of view of supply. Although I exhausted all the leftover pieces after making several sewn canvases in a row, the redistribution of my action neither stopped nor lost its momentum. I unexpectedly found myself motivated to make patches out of sheets of linen just to stock more 'offcuts' so that I could continue to create paintings on the canvases with seams. My action of using a sewing machine to connect linen offcuts formed a chain of actions until the unexpected idea of using scissors to divide a sheet of linen into small pieces emerged as a potential next step. I also accidentally tore the sewn cloth while stretching the canvas, as discussed earlier in this section. Latour explains that 'networks are good at describing long-distance and unexpected connections starting from local points' (Latour, 2011b). Latour's notion of the network helps me to not only describe my trajectory towards a happy accident, but also understand the network aspect of my painting practice.

Diagram

We can understand the correlation between a painter's action and a happy accident by introducing Gilles Deleuze's notion of the diagram into our discussion. Amy Sillman acknowledges Deleuze's diagram as 'an action, not a thing but a moment, a moment of transformation' (Sillman, 2020, p.131). Sillman's account of Deleuze's diagram seems to echo Latour's notion of the network, which 'points to a transformation in the way action is located and allocated' (Latour, 2011a, p.798). What sets a certain action apart from other actions in painting is a result of the

action, such as something that is transformational to the painting. In this sense, Deleuze's diagram shows a sign of the transformation from the 'pictorial experience' that any painter must go through at a certain point while painting, which Deleuze calls the 'experience of the chaos-germ' (Deleuze, 2003, p.102). Deleuze points out that the painter's response to the sensory experience inevitably involves dealing with uncertainty in the sense that it could be 'a chaos, a catastrophe, but [...] also a germ of order or rhythm' (ibid.).

Despite the twofold nature of this uncertainty, it can be used deliberately to create paintings. For example, the Hungary-born French abstract painter Simon Hantaï (1922–2008) is best known for his 'technique of pliage (folding), in which a canvas is crumpled and knotted, uniformly painted over, and then spread out to reveal a matrix of alternations between pigment and ground' (Gagosian, 2019). Hantaï demonstrates one way of striking a balance between the unintended qualities resulting from adopting uncertainty in painting and intended 'qualities transduced by inorganically organized objects' in the painter's interface for painting (Ash, 2015, p.43). I also sometimes embrace uncertainty, for instance, when putting a wooden stretcher within the boundary of the sewn cloth before stapling it onto the frame. The position of seams in correspondence with the edges of the stretched canvas varies. Staring at the blank sewn canvas hung on the wall, I then freely envisage exploiting the seams on the canvas to enhance the tactile sense of obsolete objects, such as videotape, as shown in the image below.

Figure 3E. *Woven Memory* (2022) Acrylic on linen, 90 x 50 cm

We can use Deleuze's notion of the diagram to describe uncertainty about whether the painter will exploit a happy accident that they encounter while painting, and if so in what way. Even after a positive sensuous quality is produced in a painting in progress, the influence of the accident on the work is still pending and left up to the painter's follow-up action. I think about Deleuze's diagram as guiding us in front of a door into 'the new order of the painting', but it does not bring us inside (Deleuze, 2003, p.102).

Like Deleuze's diagram, Latour's notion of the network is also helpful to understand the painter's actions correlated with a happy accident. It is especially good at drawing a line by tracing the painter's trajectory towards the unexpected but pleasing result from the painter's latest action, revealing a set of linear connections between the painter's actions and the painting. What Latour's notion of the network can indicate is where an action in the connections came from, what quality the action produced for the painting and where the action went to. However, it can indicate this only after the accident happens, not before. Like Deleuze's diagram, it cannot show where the last action that directly caused the accident would go next. There is uncertainty over what is coming next.

Sillman asserts that 'what a good diagram indicates' is 'that there are things beyond control' (Sillman, 2020, p.137). Deleuze's diagram suggests that 'painting [...] necessarily [...] integrates its own catastrophe' and therefore encourages painters to 'pass through the catastrophe themselves, embrace the chaos, and attempt to emerge from it' (Deleuze, 2003, pp.102-103). The uncertainty entailed in painting beyond a painter's control explains why my previous attempt to translate my painting process into an event-driven procedural programming language, Visual Basic, was able to contain only my usual routine of painting.[108] I consider untranslatable aspects of the painting process in the programming language as uncontrollable variables in the act of painting, which can drive painting, the event, to unfold not in the way intended by the painter but in an open-ended way.

[108] The translation is discussed in Chapter 1.

Holes in a network

As discussed in the above section, my painting practice has a network aspect. Despite certain limitations of Latour's (2011) notion of the network in examining the practice, the notion is useful to describe the cause of a happy accident, such as the one that occurred in my sewn canvas, but also to trace my trajectory towards the accident. However, seeing the process of painting through the lens of a network risks embellishing its interconnectivity. Isabelle Graw warns that the notion 'tends to overemphasize frictionless connectivity' (Graw, 2018, p.264).

In this regard, Alexander R. Galloway[109] points out that 'networks define nodes and edges, but they do not define the holes in the net, the gaps that let things pass while others are ensnared' (Galloway, 2021, p.237). Holes in a network do not necessarily indicate something negative about the network.

While holes are neither nodes nor edges, we can think of them not as empty spaces, which may be seen in the common visual image of a flattened net, but as something that is part of a given network, such as a happy accident. I consider holes in the network of my painting practice as a space where both unresolved or unearthed problems and untapped potentials of the practice coexist. Like the case of the happy accident, it is up to the painter whether they exploit holes in the network of their practice, and if so in what way.

Networks have the structural benefit of 'flexibility', which is 'the ability to reconfigure according to changing environments and retain their goals while changing their components, sometimes bypassing blocking points of communication channels to find new connections' (Castells, 2009, p.23). As previously detailed, I brought a sewing machine into my painting practice to achieve my goal of using linen offcuts for painting. The introduction enabled me to 'reconfigure' the network by making 'new connections' to and from the new component (node) in the network (ibid.). I also enjoyed the happy accident that was facilitated by the improved 'material condition' of the network, which drove and governed the unintended outcome

[109] Alexander R. Galloway is a professor in the department of Media, Culture, and Communication at New York University, USA.

(Latour, 2011a, p.802).[110] Since components (nodes) in a network function within the 'material condition' of their network, new components can be introduced into the network and new edges (connections) can be built within and beyond the network to expand and enhance the network (ibid.).

Regarding the benefit of building connections beyond the boundary of the network, a study by the social scientist Ronald S. Burt, who coined the term 'structural holes', concludes that 'good ideas are disproportionately in the hands of people whose networks span structural holes' (Burt, 2004, p.349).[111] Following Burt, I built hybrid connections by interconnecting my painting practice with my other practices in the digital realm, including programming, computational thinking and digital interfaces.

[110] Latour asserts that a network 'is fully dependent on its material condition' (Latour, 2011a, p.802).
[111] Burt explains: 'People whose networks span structural holes have early access to diverse, often contradictory, information and interpretations, which gives them a competitive advantage in seeing good ideas' (Burt, 2004, p.356).

3.3 The interface for the network of painting practice

Ash's (2015) notion of the interface and Latour's (2011) notion of the network intersect with each other. A painter arranges painting materials and tools in a particular way to create a painting. The painter's action initiates and runs an interface that is made up of those objects as an environment dedicated to facilitating transduction that produces sensuous qualities for the creation of painting. Meanwhile, the painter's action forms and runs the network of their painting practice. It is the painter's action that interconnects the interface and network ideas with each other. In this sense, a painter's action is the hyperlink connecting all the components together in and outside of the network of the painting practice.

Chapter 4

Painting as a network:
The internet as the ground of painting

During an online chat with a customer service agent for Amazon in early 2023, I became curious about whether the agent was really human. My interest was suddenly piqued due to the unexpected comment by the agent: ‘I like your name, Jeong’. Coupled with the global response to the public debut of ChatGPT, a text-based AI tool, around that time, I became intrigued by the idea of whether painting could also participate in conversations between humans and computers, and if so, how?

Responding to this idea, my 2023 solo exhibition was titled from the phrase ‘Hello, World!’, which has been used for decades in computer programming, especially when people write their first computer code in the programming language that they have just learnt.[112] If the coder uses the syntax of the language correctly (and the coder’s computer understands the code correctly), the computer will display the phrase on its monitor screen so that the coder can see its greeting message. By executing the programme, the coder and the computer can have their first conversation in each other’s language.

I used the exhibition as a platform to digitise my paintings in a public setting so that I could develop and test the feasibility of creating an online proxy for a painting that also contains information about its exhibition as the painted work’s context.

[112] I also participated in this traditional ritual among coders in my late teen years. I wrote the code in three programming languages, C, C++ and Visual Basic, around that time.

4.1 Painting as a network

Leonie Bradbury, a curator of contemporary art, asserts that ‘Components that were previously considered as existing outside of the work of art – the gallery, the studio, histories, other artworks or historic objects, even public programs and their participants – are now part of what constitutes the work’ (Bradbury, 2018, p.76). Following Bradbury, I reviewed two paintings featured in my 2023 solo exhibition, examining what kind of components the paintings are composed of.

Components of a painting

I made *Hello* (2023) as a polyptych painting consisting of sixteen canvases. However, those canvases are not the entire components of the painting. Amazon Locker[113] and the gallery are among the key parts of the painting.

The Amazon Locker is the subject of *Hello* (2023). In making the painting, I used the dimensions of the painting and its spatial relation with the wall in the gallery as a means to describe the subject to those who have never used the locker before. Richard Wollheim highlights that ‘the artist’s intention is crucial to the understanding of a painting just in case the intention was operative in its construction’ (Wollheim, 1987, p.166). As detailed below, it was my intention to construct *Hello* (2023) by including Amazon Locker and the gallery as components of the painting.

[113] The self-service parcel locker equipped with a touchscreen computer is increasingly replacing human labour. Serving as a point of contact for the worldwide shipping network of the online shopping giant, each locker, which is even endowed with a human name, greets the customers who come to collect or return their online orders everyday (About Amazon Team, 2018). It is a classic example of a network and interface.

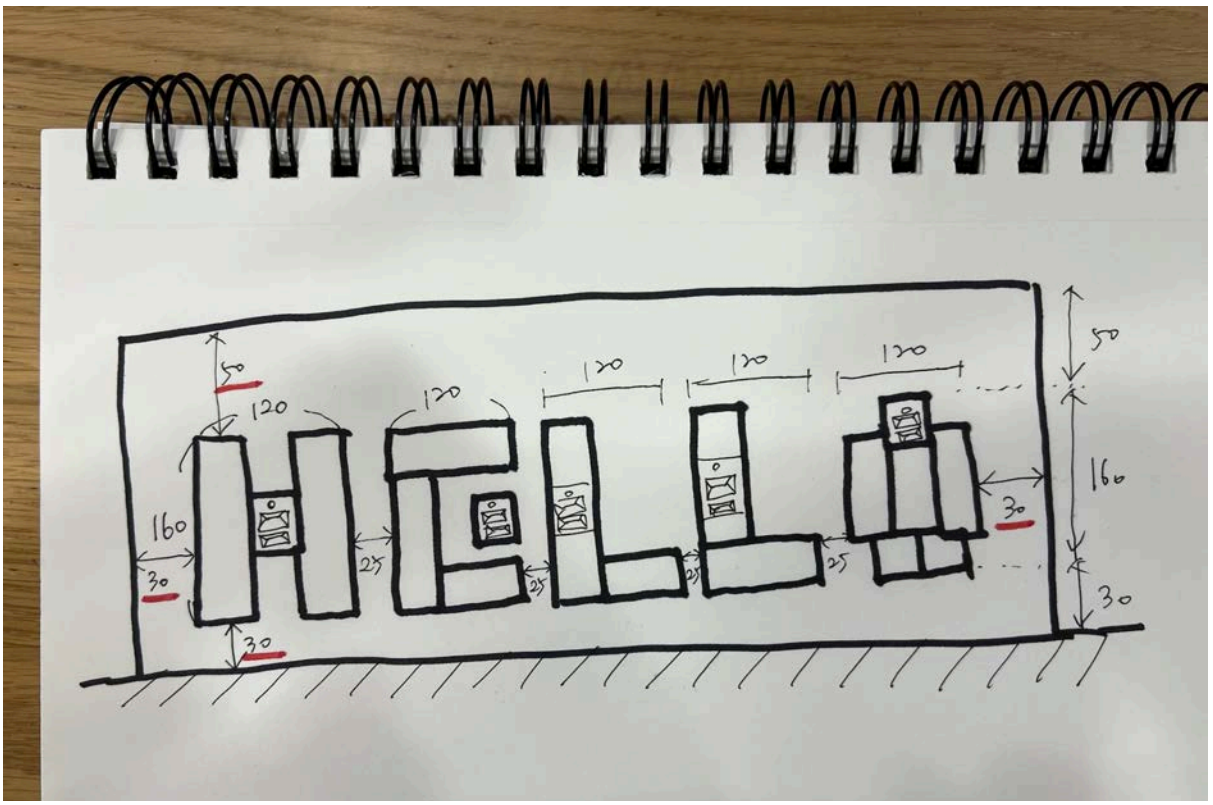

Figure 4A. My initial sketch for *Hello* (2023), made to discuss its placement on the wall

To provide exhibition visitors with a sense of encountering Amazon's electronic parcel locker in person, I created *Hello* (2023) on a near-real-life scale – 6.5 feet, approximately 198cm, in height. In order to maintain its real-life height, and while factoring in the convention of leaving wall space around the painting when hanging it, especially the space from the bottom edge of a painting to the floor, the maximum height of this exhibition centrepiece could be no more than 160cm. To give a consistent and modular appearance of the five capital letters, H, E, L, L, O, I further made the main width of all the canvases in the work 40cm, increasing by 40cm to 80 and 120cm when required.

From my experience of using several Amazon Lockers across major Western cities, I noticed that their height remains consistent, but their width varies. With this in mind, I adjusted the position of *Hello* (2023) to a lower-than-usual hanging height on the wall in an attempt to heighten its accessibility in relation to the viewer's body and the 'objectness' of the painting. As a result, in comparison to the wall space left on either side and beneath the painting, the space left above the painting to the ceiling could be stretched up to 90cm. This negative space around the painting on the wall implied

to me a sense that additional locker module(s) could be attached to both sides of the modular locker at any time if necessary.

Following this observation, I made *Hello* (2023) in direct relation to the gallery and therefore saw the exhibited space as a part of the painting. As a result, the floor plan and the size of walls in the space crucially shaped the creation of the painting in its current form. The relations between the painting and the gallery are intimate in the sense that the physical dimensions of the exhibition space were directly involved in the *transductions* between objects in the interface for my painting practice. While I was painting, as further discussed below, all the physical aspects of the gallery interconnected with the physical components of the painting.

From my previous visits to the gallery, I was aware that its low, umber-coloured ceiling would make the gallery space feel darker. To compensate for the darkness of the exhibition space I made the acrylic paintings with much brighter colours than usual, which appeared a bit too bright in my London studio with its good natural light and high ceiling. Despite my efforts to prepare and adjust to the different lighting conditions in advance in London, I was faced with more challenges on site, in Seoul. Due to the architectural features of the gallery, the lighting conditions of the gallery changed throughout the day. To identify the ideal lighting, which would work from opening to closing time of the gallery and create consistent conditions, we juggled three different types of light: daylight, strip lighting and the track spotlights.[114]

[114] Although daylight entering through the skylights made the exhibition space bright and warm in the daytime, the paintings were, in turn, subject to exposure to the sun's changing direction and an unstable amount of light from all the windows and the glass entrance of the gallery. Meanwhile, the strip light fixed on the ceiling provided an even, but not bright enough, light that could be used alone. Conversely, the track spotlight lighting, that offered flexibility in positioning and customisation, including directions, was brighter but not even (patchy).

Figure 4B. Installation view of *Hello* (2023) with spotlights

The image above gives a sense of what we were struggling with in terms of the lighting. Due to the highlighting effect of the track spotlights, the brightness of the circular areas around the paintings and the darker edges formed a distinct viaduct-like shape on the wall. The arches that were created by the shadows above the canvases were too intrusive to the eye and made it hard to view the painting without being distracted by these shapes. In addition, we found that this unwanted visual distraction appeared more noticeable in photographs than in person. I therefore worried about the possibility that installation shots taken by the exhibition visitors would capture the bad lighting and be disseminated via social media and then seen (and remembered) by an online audience.

After days of trial and error to fix the lighting, we came to the conclusion that we needed to buy dozens of new track spotlights that were dimmer and had smaller areas of coverage on the wall than those which were already installed on the track. With less than one day before the exhibition's opening, we were able to change all the spotlights in the gallery and finally resolve the lighting issue, as shown in the image below.

Figure 4C. Installation view of *Hello* (2023) with strip lighting and new spotlights

This episode of changing the entire gallery lighting system for an exhibition of paintings at the last minute reflects the medium's dependency on the physical wall on which paintings hang. In making the polyptych painting with a height of 160 cm and width of 670cm in a near-monochromatic yellow, I kept adjusting the size and thickness of the five capital letters, H, E, L, L, O, to strike a balance between the yellow canvases and the white wall. As an extended figure-ground relationship, *Hello* (2023) used the surrounding wall of the canvases as its ground to secure the balance while avoiding the monotony of a single colour. Given the unalterable role of the white wall in this instance, it needed to be considered as one of the key components of the artwork, despite the fact that the component existed 'outside of the work of art' (Bradbury, 2018, p.76). From this example, I argue that, if a painting is made in the way that *Hello* (2023) was, with particular attention to its spatial relation to the wall and preferred light conditions, the information should be available to the online viewer of the painting, which is something that my online proxy for a painting can offer.

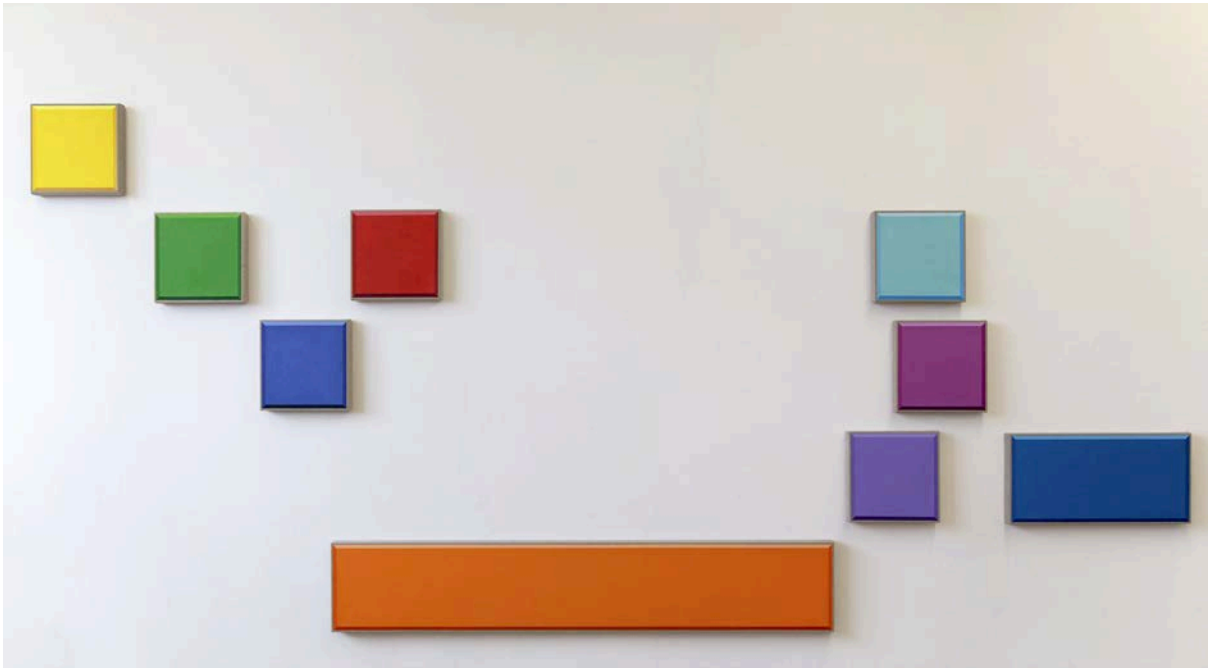

Figure 4D. *, World!* (2023) Acrylic on linen, 150 x 350 cm overall (9 parts)

As a companion to *Hello* (2023), my initial idea for *, World!* (2023) was to make the painting in the form of capital letters – using the same visual language. To exhibit it, however, I would have needed an 8-metre wall adjacent to the wall displaying *Hello*. Because the gallery did not have a wall of that size, I was forced to reconsider the idea from scratch, which became the driving force behind the creation of this painting in its current form. My inclusion of the gallery wall as a component of the painting changed the 'material condition' (Latour, 2011a, p.802) of my painting practice, initiating a new chain of transductions between the objects in the interface for painting, which led to the final realisation of *, World!* (2023).

I used a computer keyboard as a new subject for the painting. As the keyboard is still one of the most common user interfaces for human communication with computers, it appeared pertinent in discussing the exhibition's theme and languages. Both the computer keyboard and the painting-canvas share another similarity as a touch interface. The keyboard functions as a translator between humans and computers by receiving the finger movements of its user, which is converted into a language that computers understand. Likewise, the painting-canvas transforms a painter's physical act of painting into a visual language for its viewers. Responding to this, I made *,*

World! (2023) by mapping onto separate canvases each key of a computer keyboard that would be used to type the word and its punctuation.

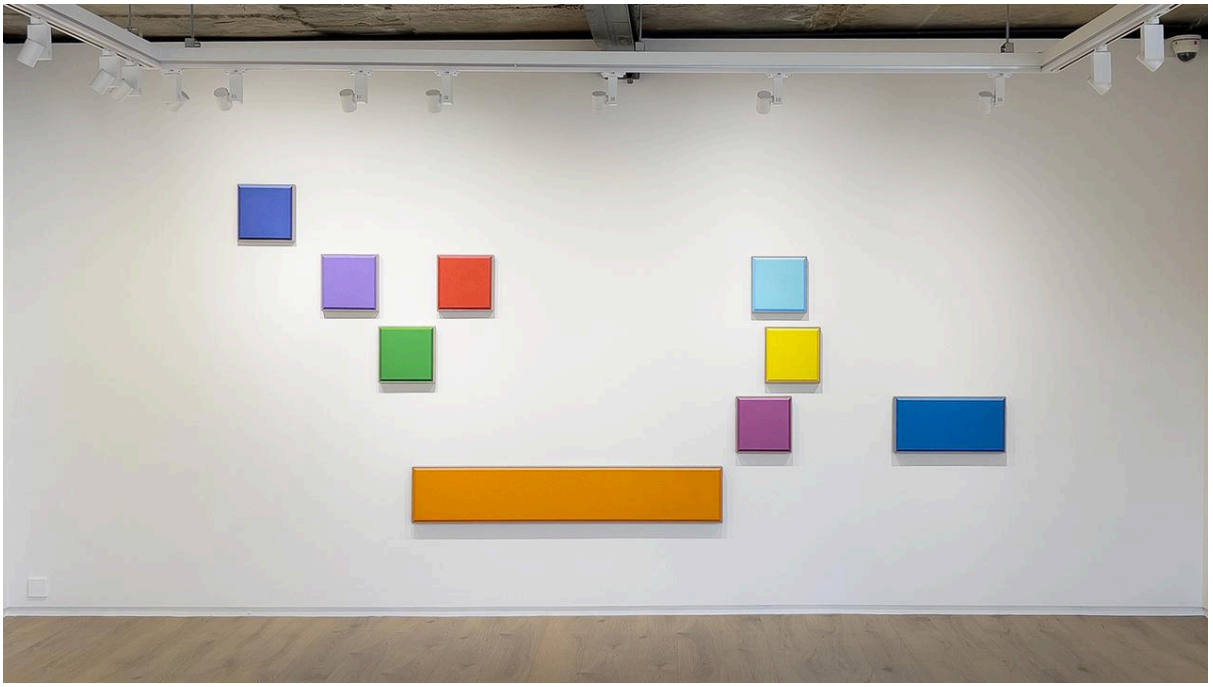

Figure 4E. Installation view of *, World!* (2023)

As shown in the two images above, I changed the arrangement of canvases in *, World!* (2023) for display at the exhibition. This was because the presence of a large yellow painting, *Hello* (2023), on the adjacent left wall conflicted with the yellow canvas in the top left corner of *, World!* (2023) in the viewer's peripheral vision. I first switched the yellow canvas with the navy one. I subsequently rearranged some of the other canvases to rebalance the nine colours.

The polyptych demonstrates the 'flexibility' of a physical painting as a network (Castells, 2009, p.23). The network allows its administrator, the painter, to reconfigure its components (nodes) to adapt to the changing environment, the exhibition, in which it operates.

A network of paintings

While an individual painting is a network of components, as discussed above, a group of paintings also forms a network. For example, I created *Hello* (2023) and *, World!* (2023) in reference to each other. While the former shortens a greeting

message from Amazon Lockers (computers) to the customer into a word that can be understood by humans, the latter enlarges the keys on a computer keyboard, the interface for conversations from humans to computers. *Hello* (2023), a modular painting consisting of sixteen canvases, represents the combination of vertical, horizontal and circular strokes of the five capital letters, H, E, L, L, O, when written by hand. The latter work, another polyptych consisting of nine canvases, indicates individual keys which need to be pressed on a keyboard for typing ‘, World!’. In addition to the conceptual links I built between them, I also attempted to form a visual connection between the two. When choosing the visual language of *, World!* (2023), I referred to the appearance of the Apple keyboard. In comparison to ‘ergonomic’ keyboards that are characterised by curved lines, the visual aesthetic of the Apple product is notably minimalist, repetitive and modular, which appeared to echo the aesthetic of the Amazon Locker – the subject of the former. Considering the conceptual and visual connections between the two, it was natural for me to seek a way of linking the online versions of the paintings and representing the network of paintings online.

The exhibition as a distributed network

Bradbury asserts that an exhibition ‘has always embraced the concept of a network’ in the sense that it ‘brings together objects, people, ideas, events, and experiences and puts them on display’ (Bradbury, 2018, p.70). In putting together ‘“Hello, World!”’ (2023), I examined the kind of network a physical exhibition is, and can be in an online context.

In response to the way Amazon Lockers welcome us by displaying a simple greeting in human language, such as ‘Hello’ and ‘Welcome’, on their touchscreens, I made the painting *Hello* (2023). I chose the English language over Korean in consideration of the fact that the location of the gallery where the exhibition would take place, Itaewon, in Seoul, is considered as the most multicultural neighbourhood in this non-English-speaking country. I also aimed to create a dialogue in English with a retrospective exhibition of the work of Lawrence Weiner (1942–2021), which was

being held in an art museum near the gallery around that time.[115] In this sense, the conceptual reference to Weiner's text-based art becomes a component of my exhibition. As the 2023 solo exhibition demonstrates, an exhibition should be considered as a network that is more than just the sum of the works exhibited on that occasion. In other words, building an exhibition of paintings essentially means creating its own dialogue by interconnecting the paintings with all the other components of the exhibition.

The exhibition forms a network that interconnects paintings, people, spaces, objects and events, and becomes a part of the larger network of my painting practice. However, a physical exhibition is a different kind of a network from 'the art world', which, as Joselit describes, 'is equipped with a sophisticated distribution network (museums, kunsthalles, art fairs, biennials, and galleries; daily newspapers, websites, and countless specialized magazines)' (Joselit, 2013, p.89). Unlike the 'distributed networks' in which 'you cannot disable the entire system by disabling individual nodes since there are many others available to take over their functions', my physical exhibition lacks 'a robustness that derives from redundancy' (ibid., pp.18-19), in the sense that it is not prepared to absorb sudden changes to its component.[116]

All the components of '"Hello, World!"' (2023) had to collaborate with each other in order that the exhibition would be successful. Given the physical and geographical constraints that are inevitably involved in preparing, transporting and running an exhibition of physical paintings in another country, I examined an alternative option for realising a painting exhibition by embracing an online and digital form.

[115] 'LAWRENCE WEINER: UNDER THE SUN' (2023–2024) at Amorepacific Museum of Art in Seoul. Weiner, an American conceptual artist demonstrates a way of making an artwork that coexists in different places at the same time by removing materiality from his work (Cherix, 2021).
[116] Galloway explains that 'the distributed network is a specific network architecture characterized by equity between nodes, bidirectional links, a high degree of redundancy, and a general lack of internal hierarchy' (Galloway, 2021, p.230).

4.2 The internet as the ground of painting

Hito Steyerl describes that the space of the internet is 'a form of life (and death) that contains, sublates, and archives all previous forms of media' (Steyerl, 2013). This is evident on Google's Arts & Culture Platform, which promotes art and artefacts housed in cultural institutions around the world by presenting the works in the form of digital media to global audiences. The online platform notably 'accepts a variety of media types' of art and artefacts from participating institutions, including still images, 360-degree images, YouTube videos, audio clips, documents and 3D objects (Google Arts & Culture Platform, n.d.). Although the submission to the online platform is open to invited institutions only, the list of media types accurately reflects the current internet environment in which various digital formats are used concurrently to digitise artworks and share content over the digital network.

Among the image formats that are viable online, 3D scanning is increasingly used in art institutions and galleries to provide an online audience with the opportunity to enjoy on-site exhibitions in an alternative digital format. For instance, I showed my painting *Interface V* (2018)[117] at 'NAE Open 2019', which was organised by New Art Exchange in Nottingham, UK. The 3D digital version, or 'virtual exhibition', of the group exhibition held at the venue were made available online.[118] I discuss this 3D format as an example of the kind of ground the internet offers for painting to be represented in digital form.

Latour asserts: 'The more digital, the less *virtual* and the more *material* a given activity becomes' in a network (Latour, 2011a, p.802). The COVID-19 lockdowns are vivid examples that demonstrate that this assertion is directly applicable to the internet: 'YouTube [...] lowered its default video quality to standard definition, in response to a possible bandwidth strain brought on by thousands upon thousands of people self-isolating' (McMullan, 2020). Latour therefore summarises that 'the expansion of digitality has enormously increased the *material* dimension of networks' (Latour, 2011a, p.802). The activity of digitising my 2023 solo exhibition in a 3D scan format called Matterport to present a 'virtual exhibition' of the physical,

[117] For the image of *Interface V* (2018), see: Figure 9A in Appendix III
[118] For the virtual exhibition of 'NAE Open 2019', see: https://v21artspace.com/nae-open-2019

geographically specific show to global audiences is heavily dependent on the ‘material condition’ of the internet as detailed below (ibid.).

During the digitisation of the exhibition on site, an internet connection is essential to process the scanned data of the exhibition. This is because to convert into a 3D format, the data must be uploaded to the Matterport server. The online processing not only takes a long time but is a step that cannot be postponed or left out, since it is vital to check the result of the processing of the scan on site in order to decide whether it needs rescanning, and if so, at which spot. Given that there is no option to edit images in the format, as will be discussed later, multiple takes (and subsequent waiting times for data processing) are key parts of making the 3D digital version of the exhibition. Because it requires a reliable internet connection and a prompt response from Matterport server, I had to rely solely on related IT (information technology) infrastructure, including interconnected physical components such as routers, cables and the company’s server located somewhere on the planet.

Publishing the content digitised in 3D format online is also entirely dependent on the company’s host server, which is the only way to manage the digital version of the exhibition and present it to an online audience. By doing so, my digital content began occupying some of the physical data storage of the company’s server.

To summarise, as the ground of painting, the internet does not currently offer enough ‘tooth’ for painters to use the 3D scan format on the basis that it is exclusively platform dependent and, at the time of writing, requires the highest maintenance. This example highlights the importance of considering the correlation between the internet and digital formats used to create an online proxy for a physical painting.

4.3 Paintings in digital form

Paintings as NFTs

A series of Hilma af Klint's paintings, entitled *Paintings for the Temple* (1906–1915), was converted to NFTs (non-fungible tokens) in 2022. In response to a strong objection by a relative of the Swedish artist that the digitisation for sale would contradict af Klint's (1862-1944) intention for her meditative work, the publisher justified its decision to convert the paintings by arguing that the digital transfer aimed to 'secure the paintings digitally for the future regarding colour representation, size and with their proper titles' and to fix 'a lot of poor depictions' of the work available digitally (Liu, 2022).

Setting aside the dispute over whether making and selling an NFT version of af Klint's paintings contradicts the artist's will, this presents the question of whether an NFT is a suitable format to represent a physical painting online. Building on the idea of a physical painting as a network of components, I examine whether NFTs, which exist and operate in a network, can present the network aspect of the medium of art to an online audience. An NFT is not concerned with image quality or materiality, but mainly concerns the copyright of digital content, such as a digital image, to which the digital format is linked. Also, the one-to-one link between an NFT and a single digital item of content is ineffective in representing the whole network of a painting online.

The NFT format is known for its built-in ability to trace and confirm the previous and current ownership of any online content made in the format (Finzer, 2020). This feature of an NFT can be readily used for a commercial purpose, which may contribute to the increasing popularity of art in NFT format, attracting mainstream galleries and even some major art museums, such as MoMA in New York (Small, 2022). Despite the initial impression that this feature of NFTs might be helpful in confirming the authorship of a physical painting online, it is beyond the capacity of this digital format. Grimmelmann, Ji and Kell point out: 'Too many NFTs to count use stolen art' and continue by clarifying that what a NFT format ensures does not concern the authorship or the copyright of an original artwork used as a source for

an NFT artwork, but merely the ownership of the digital content linked to NFT only (Grimmelmann, Ji & Kell, 2022).

In this regard, the artist Damien Hirst (b. 1965) established the rights of his creation used in an NFT by specifying how the artwork should be treated beyond its ownership. Hirst set explicit rules regarding the sales of NFTs of his 'Spot' paintings for his year-long NFT project, 'The Currency' (2022). Each buyer of one of Hirst's 10,000 NFTs had to choose between keeping the NFT version or exchanging it for the original physical painting by the deadline set by Hirst, after which, crucially, the unselected NFTs or unexchanged physical paintings would be destroyed.[119]

Hirst's NFT painting project draws our attention to the developing relationship between a physical painting and its NFT version. Unlike a born-digital NFT artwork, an NFT that is made based on a physical artwork forms a special relationship between the original/analogue and the copy/digital, while both versions have a chance to be considered as genuine artworks, depending on the context, as questioned by Hirst. Meanwhile, unlike Hirst's project, that consists exclusively of one-to-one pairings of physical paintings with an NFTs, paintings in the series *Paintings for the Temple* by Af Klint were deliberately duplicated in two sets of NFTs to ensure that one set was for individual sale and the other was not for sale. This example demonstrates that the relationship can vary: an NFT representing a physical painting does not necessarily have a one-to-one relationship with its corresponding original artwork.

Moreover, this dynamic relationship between the physical and the digital appears to be an important part of painting in the NFT context when the NFT is made based on a physical painting. Unlike af Klint, Hirst exercises, in his NFT project, full control over how to set up the relationship. The conceptual link designed by the painter between the physical and the digital should be regarded as a key component of an NFT painting. Furthermore, a performance in which Hirst burned thousands of his unselected physical paintings in front of the buyers also plays a part in his NFT

[119] This social experiment has become more interesting due to the uncertainty about NFT art's long-term market value. Critics appear to struggle to find artistic merits in Hirst's NFT project over a monetary incentive, which might influence the final result of the project – 4851 NFTs and 5149 physical paintings by Hirst remain after the set deadline (Hallett, 2022; Januszczak, 2022).

paintings (Burgos, 2022). In this sense, Hirst's NFT project demonstrates a potential way in which various art (analogue) mediums and (digital) formats could collectively create NFT paintings.

Hirst's 'Spot' paintings are made with 'enamel paint on handmade paper' (Januszczak, 2022). Interestingly, his process of making the paintings, assisted by AI neural networks, seems to be to ensure the uniqueness of each piece among the other 10,000, rather than to achieve a particular material quality as a physical artwork (Peplow, 2022). This is because Hirst's chosen materials and their application/use do not appear to be attributed to the success (or failure) of either his NFT painting project or each individual painting. The seemingly diminishing role of physical materials in NFT art may not be confined to Hirst's work – David Joselit suggests the 'NFT is a social contract that values property over material experience' (Joselit, 2021, p.4).

The following aspect of NFT art also contributes to the poor quality of the material experience. When 'minting' NFT art, what is recorded on a blockchain, NFT's technical foundation, is usually a simple link to digital content, such as a digital reproduction of a physical painting stored somewhere in cloud servers,[120] on which most NFT art platforms[121] also run. In other words, an NFT cannot contribute to the image quality of the digital reproduction of a physical painting to which it refers.

Despite theoretical and philosophical suggestions that blockchain technology is the epitome of a decentralised, democratic and thus user-centred network, the application of NFT art is critically dependent on the monopoly of major online platforms, which entrenches the 'network effects', such as the concentration of wealth in digital networks (Lanier & Weyl, 2022). Steyerl criticises art in NFT form because of the 'sloganeering and propaganda' of new digital technologies, which continue their activity, but are unsuccessful in yielding their promised result, and asserts: 'At the moment, art is an excuse, or a pretext maybe, to roll out the [crypto] infrastructure' (Farago, 2021). Suppose a painter puts all the material information about their painting in an NFT. Regardless of the quality of that information, it would

[120] E.g., AWS (Amazon Web Services), Microsoft Azure, Google Cloud Platform, etc.
[121] E.g., OpenSea

be a different task to present the painting's physicality to online audiences. At the time of writing this thesis our viewing experience of digitised paintings via online platforms that specialise in NFT art is accompanied by NFT displays and digital frames, at best. No matter how advanced the equipment designed to display NFT art is, our viewing experience through the existing equipment is essentially the same as viewing images on a computer screen. It is thus not very different from other digital interfaces, e.g., commercial galleries' OVRs (online viewing rooms).

Paintings in NFT form exemplify both the potential and the limitations of the digital format operating on the internet. The format exemplifies a way of crediting an online image of a painting. However, the structure of the format is most effective in representing a one-to-one relationship, such as an exclusive link between an NFT and a single digital entity, e.g., a digital photograph of a painting published online. In this sense, it appears less effective in representing a physical painting, which is more of an entangled network of components. A digital format that is suitable to contain this entangled network aspect of a painting is needed to create an online proxy for a painting. I therefore conceived the proxy in the form of a network of online content combining both images and text, each of which has a different role in the proxy, as explored below.

Image-based digitisation of a painting

Amy Sillman points out that 'The physicality of painting and the way it can be built and constructed isn't easy to show in other formats' (Enright, 2015, p.47). It can be more difficult in digital form. Taking this into consideration, it is important to examine the pros and cons of digital image formats in terms of each format's suitability to capture the physicality of painting. To do this, I took images of paintings on display in the exhibition with my smartphone and DSLR (digital single-lens reflex) camera.

A photographic image of a painting can depict the painting in a realistic way, but it may not contain and convey the whole idea of the painted work, regardless of the image quality. In other words, a single frontal image of a painting, which is widely used for digital reproduction, is insufficient to emulate what the wall-based art would have conveyed to those who are facing it in person.

Figure 4F. *Bodily Memories* (2023) Acrylic on linen, 90 x 50 cm each (3 parts)

For example, *Bodily Memories* (2023) is a triptych made of acrylic on stretched linen canvases. A conventional description of the materials used in the painting would be ‘acrylic on linen’. Yet this description, with the frontal image (like the one above), may not inform online viewers of its various physical aspects, many of which are, however, visible to viewers of the physical exhibition. This is because I used metallic pigments to create visible variance in colour and value that are dependent on light and the viewing angle. Although this sensory information would conventionally be omitted from the description, or shortened to merely ‘acrylic’, the type of paint used, and its surface quality, would easily be seen by those who look around the edges of the painting in situ.

Figure 4G. Angled view of *Bodily Memories* (2023)

To capture the surface quality of *Bodily Memories* (2023) on view at the exhibition, I attempted to record videos of the triptych by mimicking the way a painting is seen ‘in the flesh’.

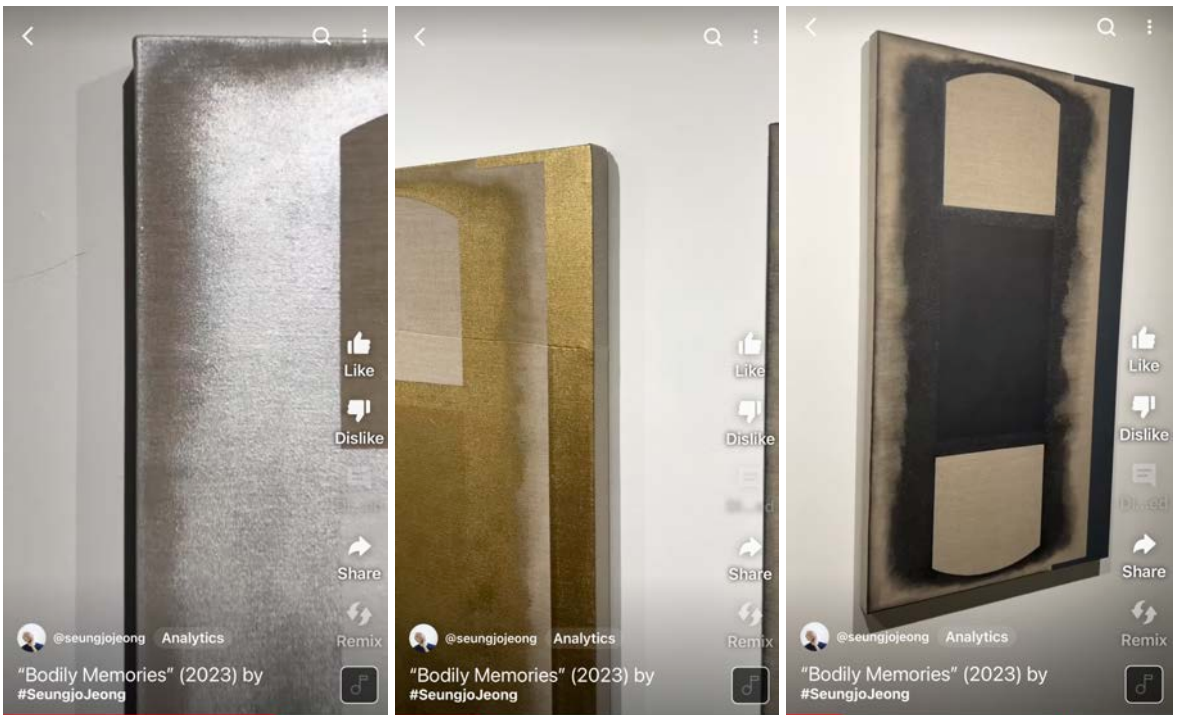

Figure 4H. Screenshots of a YouTube video featuring *Bodily Memories* (2023)

This video footage shows each canvas, one after another, revealing the surface quality which continuously and gently changes in response to the camera angle. In comparison to still photography, video offers viewers a chance to experience the changing quality of the work from different angles without interruption, as shown in this example.

However, as the screenshots above demonstrate, the video exposes the weakness of video format in terms of image quality. While video image quality has been gradually improving,[122] photography still offers irreplaceable image quality, as exemplified in the high-resolution image of the painting below.

[122] I filmed videos of the exhibition in 4K at 30 fps (frames per second), one of the most compatible video formats provided on my iPhone that offers the highest image quality.

Figure 4I. Detail of *Bodily Memories* (2023)

In comparison to still image formats, however, a video format has the advantage of creating an immersive viewing experience of a physical painting. This is because the format has the unique ability of conveying image with sound.

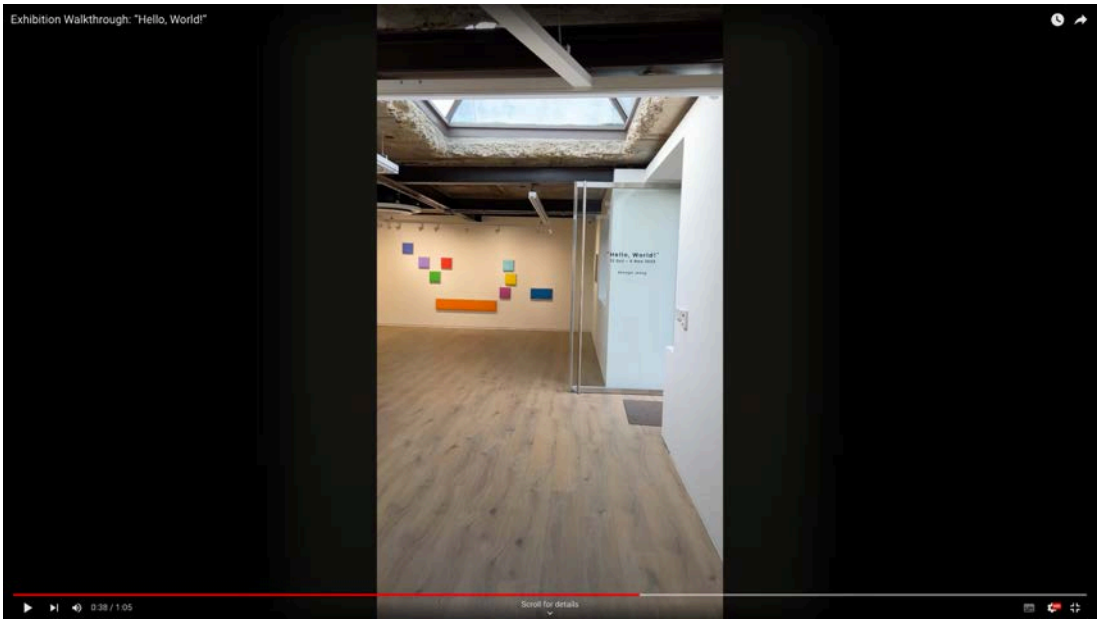

Figure 4J. Screenshot of a YouTube video: Exhibition Walkthrough: '"Hello, World!"'

While a video, such as this, which is often dubbed an ‘exhibition walkthrough’, literally walks viewers through the exhibition space, the combination of moving images and the sound of my feet on the wooden floor with ambient noise gives the viewer a useful hint as to what kind of space it is. A video format has the advantage of presenting a more heightened sense of presence at the exhibition venue than any other format, thanks to its ability to capture the ambient sound and minute changes in lighting of the exhibition space.

However, its viewing angle is unavoidably fixed during the video recording, like a still image format. In contrast, one can benefit from a 3D scan of an exhibition of paintings to view each work on display from any chosen angle.

Figure 4K. Screenshot of the 3D scan of ‘“Hello, World!”’

3D scans have the unique ability of demonstrating the spatial interplay between physical paintings and the exhibition space, providing an online audience with multiple viewing angles. However, despite the merits of this format, it also has clear limitations in its ability to show the physicality of painting, as discussed below.
As shown in the above image, the image quality of this 3D version is not crisp but soft, and even a little blurry. It is subjective, but the quality is acceptable for use as reference. However, it is certainly not good enough to create the immersive quality

that I had hoped for and experienced with Matterport's dedicated 3D camera in the 2022 group exhibition. Another issue is that the smartphone option generated uneven lines, including broken straight lines, and distortion to linear planes, as exemplified below in the 3D version of '"Hello, World!"'. The screenshot below also shows the misalignment in the first letter 'L' canvas of *Hello* (2023).

Figure 4L. Screenshot of the 3D scan of *Hello* (2023)

The most obvious problem I identified in Matterport's 3D scans, which is also related to the issue of misalignment mentioned above, is that this format does not allow the creators to edit the stored data in the way that photographs and videos can be edited using computer editing software such as Photoshop and Final Cut. Simply put, the format does not facilitate the most basic retouching, such as adjusting the brightness of scanned images. In order to enhance the image quality of the format, at the time of writing, the user has no option but to use a trial and error approach, rescanning the space until they somehow get it right (which can prove challenging in a space with changing natural daylight). This problem means that the 3D scan format is currently less than ideal as a way of effectively presenting the physicality of painting online.

As discussed, each image format has its own strengths and weaknesses in digitising the physicality of a painting. Given the difficulty of making use of the 3D scan format in practice, each image format should also be considered in terms of its usability in real life settings to manage the content of a painting and present it online.

Text-based digitisation of a painting

The image-based digitisation of a physical painting may not encompass all the components of the work. While the image formats discussed in this chapter – still, moving and 3D images – are more or less effective in capturing the physical aspects of a painting, text-based formats may be more suitable for digitising the conceptual aspects of the painting. For instance, how can an image be made to relate the component of *Hello* (2023) in which the painting contains conceptual references to Weiner's work? To embrace different kinds of components of a painting in digital form, it is therefore essential to bring together multiple formats in such a way that the formats complement each other. So along with photographic images in different formats, physical, conceptual and administrative information about a painting in a text-based format should be part of an online proxy for that painting.

The text-based digitisation of a painting is useful not only to document the conceptual aspect of the painting but also to build the context of the painting's content in image formats. Steyerl considers images as semi-autonomous 'agents' (Steyerl & Olunkwa, 2021). The influence and reception of the 'agents' of the painting, which probably do not contain sufficient information about the work, are uncontrollable by the painter once they are published online. As discussed in Chapter 2, contemporary painters have only a loose grip on how their paintings are featured online in terms of the context of their work.

The algorithmic manipulation of the context of user-created content by image-sharing social media platforms is not the only factor contributing to this problem. Anyone can take photos of a painting on display in a public exhibition and upload their images onto 'participatory media' (Eichhorn, 2022, p.149). While the online images available on these platforms are roughly considered to be digital versions of the painting, regardless of the painter's consent and their image quality, any internet user can

access, use, modify, recontextualise and/or disseminate them in their own way as user-generated content through the digital networks, all of which are beyond the painter's control. Besides, images are essentially 'semi-autonomous actors' (Steyerl, 2014) online.

To regain some control over the online presence of a painting when it appears on the internet, it is necessary for the creator of the artwork to digitise both visual and textual information about the painting in appropriate media formats, publish the digital content online and ensure that the online content collectively acts as the work's online proxy. The next chapter discusses how this may be achieved by interconnecting the online content made in multiple media formats and establishing the online context based on textual information about the artwork.

Chapter 5

Painting as network: online proxy for a painting

‘Vermeer’ (2023), a retrospective exhibition of paintings by Johannes Vermeer, consisting of more than two-thirds of his surviving works, opened at the Rijksmuseum in Amsterdam in 2023 (Farago, 2023). Tickets for this long-awaited exhibition sold out ‘within days of opening’, with more than three months left to run (Greenberger, 2023). The much belated launch of the exhibition reflects how hard it was for the world-renowned art museum to collect Vermeer’s paintings, scattered across countries in Europe and America, and put them together in one place. The exhibition’s online guide, freely accessible on the museum’s website, featured high-resolution photographs of the Dutch painter’s work, augmented with an accessible explanatory voiceover that demonstrated the irresistible convenience of a digital interface equipped with internet connectivity.

Building on this contemporary attempt at bringing digital media formats together in an accessible online presentation of physical paintings, I examine how ‘interoperability’ could create an online proxy for paintings as a way to build an online context for artworks.

5.1 Interoperability

According to the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC), interoperability is defined as the ‘capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units’ (ISO/IEC, 2003, p.9). In other words, ‘interoperability is what allows the massive tangle of interfaces that we call the internet to function’ (Duan, 2022, p.117).

In an open-access article about Vermeer’s painting in the *Journal of Historians of Netherlandish Art*, the authors make good use of a purpose-built online image viewer. They offer online readers the unusual experience of seeing the ‘visible light, false-color IRR, XRF copper map’ of *A Lady Writing* (1665) on the image viewer, where the viewable proportions of the layered images are cleverly manipulated by the movement of the cursor for easy comparison (Gifford, Dooley & Delaney, 2022). I call attention to the technological capability, the interoperability, on which the journal article relies to present the construction of Vermeer’s painting, revealing the delicate brushstrokes piled up on the surface. This example demonstrates how we are now able to conveniently enjoy high-resolution images of major artworks, along with authoritative information about the works provided by related institutions. All the visual and textual information managed by institutions, spread across the globe, is retrievable together via the internet, thanks to the implementation of interoperability.

The above example of an online image viewer shows a practical application of the International Image Interoperability Framework (IIIF). IIIF is supported by a consortium of major cultural institutions around the world; it aims to increase both the data credibility of digitised artworks and artefacts and the convenience of online access to the digital content (Burgess, 2023). Simply put, IIIF enables internet users to enjoy high-resolution images of specific artworks (from institutions participating in IIIF), along with accurate information about them, by dragging and dropping the IIIF logo accompanying the images into an IIIF-compatible image viewer, requiring no working knowledge of the underlying technology from the user.

At the time of writing, however, it looks less affordable, especially for emerging painters, to personally employ IIIF in their own art practice to digitise their paintings in an IIIF-compatible format and provide a high-quality version of their works online. This is partly demonstrated in the fact that even the authors of the article cited above acknowledge ‘the generosity of the University of Heidelberg’s heidICON’ (a virtual slide collection) in supporting the hosting of IIIF images of paintings by a major old master such as Vermeer (Gifford, Dooley & Delaney, 2022). Based on this case, it appears safe to assume that it could be either expensive or technically difficult for individual painters to run or outsource a web server at their own expense in order to host IIIF-compatible images of their painted work. Indeed, according to the IIIF Consortium, various technical and administrative procedures are a prerequisite for implementing IIIF in practice (Ronallo, Brumfield & Brumfield, 2017).

The successful application of interoperability between global host servers for sharing visual and textual information about artworks with online audiences nonetheless suggests a way of creating an online proxy of a painting.

IIIF demonstrates a way to encompass both a physical painting and its digital content made in various media formats while keeping each individual content of the painting as it is in its current location. I see this as a real-life example of ‘semantic interoperability’, which means ‘enabling different agents, services, and applications to exchange information, data and knowledge in a meaningful way, on and off the Web’ (W3C, 2005).[123]

In order to ensure that all the digital content made in different formats, possibly scattered across different websites and media sharing platforms such as YouTube, are accessible to those who are searching for a painting as components of the same artwork, I use metadata as a means to enable the semantic interoperability of a painting.

[123] W3C: World Wide Web Consortium

5.2 Metadata

In her essay ‘A Cyborg Manifesto’, that explores the relationship between human and machine, Donna Haraway proposes that ‘any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language’ (Haraway, 1991, p.163). I use metadata as the ‘common language’ to interface a physical painting with its associated online content as part of the creation of an online proxy for the painting, as I describe below.

Metadata can be defined as ‘data describing the context, content and structure of records and their management through time’ (ISO, 2016, p.4).[124] Organising the metadata of a painting and annotating the online content relating to the work with this metadata is a practical way for painters to build the context of their paintings online with accurate information via search engines, which interpret the online content based on the provided metadata on behalf of search engine users. In this way, publishing metadata online connects a painting with its associated online content that is available in various media formats, creating a hybrid network between the analogue artwork and the digital content. In other words, metadata acts as ‘joints’ to ‘accommodate and manage heterogeneous elements’ in a network (Galloway, 2021, p.130).

The joint can be built and used online in the form of a metadata schema. A metadata schema is a standard that defines data structure in a format that is made to be specifically both human readable and machine readable ‘for improving data interoperability across the web’ (Iliadis et al., 2023). A metadata schema is also part of the metadata. In general, a metadata schema encompasses descriptive, administrative, structural, preservation and use metadata (Pomerantz, 2015, pp.17-18). Metadata schemas are a set of standardised structures of data that are ‘designed to enable description of any resource’ – various types of things in the world (ibid., p.29). In this sense, I use a metadata schema as the ‘proper standard’ (Haraway, 1991, p.163) to connect a physical painting with its associated online content by communicating the metadata to online search engines.

[124] This is the definition of the term stated in ISO (International Organization for Standardization)’s Technical Report entitled ‘Information and documentation’.

There are different versions of metadata schemas developed for specific purposes by different organisations (Pomerantz, 2015, p.56).[125] Among these organisations, Schema.org is a project that is co-supported by major search engine companies such as Google, Microsoft and Yahoo (Schema.org, 2024). This ongoing project is considered as a prominent example of 'globally coordinated efforts to create a universal structured data model' (Iliadis et al., 2023). Schema.org aims 'to create, maintain, and promote schemas for structured data on the Internet' (Schema.org, 2024). For instance, it offers a schema designated for painting, which specifies various properties of the medium and provides the relevant metadata vocabulary – as a form of structured data.[126] Although the schema also has limitations and involves inconvenience in describing certain aspects of painting, discussed later in this section, using Schema.org's schemas is a practical option for painters working today.

Below is an example of the metadata of my painting *Preloved* (2022), for which I organised the metadata using Schema.org's schema. I have built the structured data of the painting by filling in the following properties in the schema: the artist's name (Seungjo Jeong), the year of creation (2022), the art form (Painting), the materials used for making the artwork (medium: acrylic; surface: linen), its title (Preloved), its dimensions (width: 75cm; height: 55cm; depth: 3.6cm), the location where it was made (London) and the name of an exhibition at which it was shown (Contemporary British Painting Prize 2022). The schema also has a property that corresponds to the web address of the painting's image, which means the online content of the painting is linked to the work's metadata once the metadata is published online.

```
<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2022",
  "artform": "Painting",
```

[125] E.g., Dublin Core, VRA Core
[126] 'A dataset organized according to a data model' (Pomerantz, 2015, p.211).

```
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": "Preloved",
  "image":
"https://lh5.googleusercontent.com/vWEDvFB_JC-2Zqh2alb9LZ4MC4Mx_c_jjXlyY3F
7ZsSLvT3HI3KE9rLJWq4sNVtcJyShAshO32hkkwMfXBmktk0RhnQK21eqiTe_cN0_
w6tYSl8UhF9pC3gv72cmxZEI1Q=w1280",
  "artMedium": "Acrylic" ,
  "artworkSurface": "linen" ,
  "width": [
  {
      "@type": "Distance",
      "name": "75 cm"
    }
] ,
   "height": [
  {
      "@type": "Distance",
      "name": "55 cm"
    }
] ,
   "depth": [
  {
      "@type": "Distance",
      "name": "3.6 cm"
    }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
```

```
    "@type": "ExhibitionEvent",
    "name": "Contemporary British Painting Prize 2022"
  }
}
```

As is clear, the above metadata of the painting is written in plain English. This example shows that it is possible for those with no programming experience to at least understand what kind of data about the painting is contained in the metadata. To ensure that the human-readable metadata can also be processed by computers, it is organised in a machine-readable format, called JSON (JavaScript Object Notation), which is one of the syntaxes widely used for schemas and is regarded as 'a lightweight data-interchange format' (JSON, n.d.). Through compatible formats, Schema.org's schema addresses the difference between the formatted metadata and the verbal language, which is that 'natural language is often ambiguous, so control is necessary to limit the complexity of metadata records' (Pomerantz, 2015, p.49). In this sense, the schema is 'the proper code' (Haraway, 1991, p.163) to build the online proxy for a painting 'in a common language' (ibid.).

John Palfrey[127] and Urs Gasser[128] theorise that 'interoperability functions on four broad layers', which consist of technological, data, human and institutional layers (Palfrey & Gasser, 2012, pp.5-6). The use of metadata schemas to implement the interoperability of a painting on the internet can be assessed by each of the layers. At the technological and data layers, it is more practicable for painters to organise the metadata of their paintings with the help of free online tools and publish it on their websites than making and hosting IIIF-compatible content by themselves, as discussed in the previous section. At the human layer, there seems to be no problem on the basis that online users are active in sharing and enjoying photos and videos of paintings online, especially on 'participatory media' (Eichhorn, 2022, p.149). At the institutional layer, any digital content that is made based on a painting can respect the copyright in the original artwork through 'rights metadata', which provides information about 'access control' to the online content (Pomerantz, 2015, p.95).

[127] John Palfrey is the president of the MacArthur Foundation.
[128] Urs Gasser is a professor of public policy, governance, and innovative technology at the Technical University of Munich.

Metadata of a painting exhibition

Obviously, it is difficult to consider a painting separately from the context in which it is exhibited.[129] Even if a painting is conceived and made as a stand-alone piece, in the event of an exhibition it inevitably builds a relationship with other artworks to create a particular dialogue with them as part of the exhibition. Using metadata schemas for both a painting and an exhibition will collectively inform search engines to provide users, who are searching for a painting with the data of both the painting and its exhibition as the context of the work. Since a metadata schema for an exhibition is designed to contain some data about exhibited works, as described below, it increases the chance that a painting will be discovered by those who use Google to search for the exhibition but may not know the painting yet.

Figure 5A. Installation view of my paintings at ‘Contemporary British Painting Prize 2022’ at Huddersfield Art Gallery, Huddersfield

[129] For example, I made *Hello* (2023) and *, World!* (2023) for my 2023 solo exhibition, aiming to create an interplay with the gallery space, as detailed in the previous chapter. In this sense, the exhibition should be considered as a part of the paintings because they are inseparable from each other.

Preloved (2022) was featured in the exhibition ‘Contemporary British Painting Prize’ (2022), a group exhibition organised by an artist-led organisation, Contemporary British Painting (Contemporary British Painting, n.d.). The painting was shown in the exhibition with two other paintings by me: *Interface L* (2020) and *Interface V* (2021).

I assembled the metadata of the exhibition, also in JSON format, using Schema.org’s schema for Exhibition Event. Please note that the metadata below is incomplete and can be expanded by including the data of paintings by the other sixteen painters whose work was also featured in the group exhibition.

<script type="application/ld+json">

{
  "@context": "https://schema.org",
  "@type": "ExhibitionEvent",
  "location": "Huddersfield Art Gallery, Huddersfield",
  "url":
"https://www.contemporarybritishpainting.com/cbp-prize-2022-exhibitions-huddersfield-and-london/",
  "name": "Contemporary British Painting Prize 2022",
  "startDate": "2022-09-17",
  "endDate": "2022-10-29",
  "description": "A group exhibition of paintings by 17 painters, Daniel H Bell, Sophie Birch, Helen G Blake, Andrew Bryant, Lesley Bunch, Michelle Conway, Seungjo Jeong, Bernadette Kiely, Helen Kincaid, Lindsay Mapes, Sonia Martin, Samuel O’Donnell, Mahali O’Hare, Simon Parish, Jen Roper, Shawn Stipling and Mimei Thompson, selected by Susan Absolon, Deb Covell, Paul Newman and Casper White",
  "organizer": "Contemporary British Painting",
  "workFeatured": [
    {
      "@type": "Painting",
      "name": "Preloved",
      "dateCreated": "2022",
      "creator": {

```
        "@type": "Person",
        "name": "Seungjo Jeong",
        "Url”: "www.instagram.com/seungjo.jeong"
      }
    } ,
    {
      "@type": "Painting",
      "name": "Interface L",
      "dateCreated": "2020",
      "creator": {
        "@type": "Person",
        "name": "Seungjo Jeong"
      }
    } ,
    {
      "@type": "Painting",
      "name": "Interface V",
      "dateCreated": "2021",
      "creator": {
        "@type": "Person",
        "name": "Seungjo Jeong"
      }
    }
  ]
}
</script>
```

Limitations of using metadata schemas

We should acknowledge that there are some limitations when using metadata schemas for presenting paintings online.

Above all, metadata schemas work as intended only when the online standard is used by both machines and humans, because the use of schemas is not compulsory on the internet, but voluntary. Specifically, for a painter to implement Schema.org's schemas does not always guarantee that the provided metadata is applied to the online content associated with the painter's work at the online viewer's end. In this regard, there is reasonable concern about how information relating to a painting and its context is shown to the online viewers, and the decision is left to the discretion of online search engines (Iliadis et al., 2023).

Another potential scenario is that search engines might effectively discourage those who are searching for a painting from visiting the painter's website to find more information about the work. This is a plausible possibility because the search engines that provided the metadata for the painting will be able to provide sufficient information to their users in a way that makes them remain longer on their search result page rather than visiting the artist's own website (ibid.).

In practice, only established artists have been granted the opportunity for their names to be registered and used in controlled vocabularies managed by art institutions, such as Getty Research Institute.[130] The arrangements are regarded as highly effective in increasing data accuracy by '[preventing] names from being misspelled' and '[eliminating] ambiguity about different individuals with the same name, etc' (Pomerantz, 2015, p.139). In this sense, it is a shame that many other lesser-known artists are effectively excluded from this clear benefit of using metadata on the internet.

There are also limitations to metadata schemas themselves. For instance, Schema.org's schema for Painting has room for improvement in terms of the structure of properties it offers. Although the schema is designed to be readily able to

[130] E.g., the Getty's Union List of Artist Names (ULAN)

accommodate custom-made properties, more physical and conceptual aspects of the art form can be identified from a painter's perspective and defined as its default properties, so that the painter can use the schema immediately without confusion.

Figure 5B. *Frankenstein* (2022) Acrylic on canvas, 91 x 41 cm each (3 parts)

Taking my triptych painting *Frankenstein* (2022) as an example, I compared Schema.org's two metadata schemas, 'Painting' and 'Visual Artwork', to see how easy they are to use for annotating the online content relating to a physical painting.

Unlike the schema for Visual Artwork, which has three separate properties, 'height', 'width' and 'depth', the schema for Painting has only one combined property, 'size'. In practice, it is much easier to put a number in each designated property to eliminate the unnecessary confusion of working out which of the two, height or width, should come first and also to work out a proper formatting of the measurement data

to make it machine readable. However, neither schema has a property that we can use to describe the dimensions of each part of a polyptych painting like *Frankenstein* (2022).

As for the materials used to make the painting, the schema for Painting has a single property, ‘material’ (acrylic on linen). The schema for Visual Artwork, however, has two properties, ‘artmedium’ (acrylic) and ‘artworkSurface’ (linen) respectively, which are more versatile, as they can be considered separately.

For these reasons of convenience, I used the schema for Visual Artwork, that is designed to encompass a range of visual art forms, to show the metadata of the painting *Preloved* (2022) in the above section, rather than using the schema for Painting.

Although both schemas have a property named ‘hasPart’ that appears to be used to refer to a part of a painting, the property can designate only one individual part, which is ineffective for describing a painting made in multiple parts, like the triptych *Frankenstein* (2022). As it is designed, this property seems more useful to describe a one-to-one relation between the metadata of a series of paintings, e.g. my *Mirage* painting series (2022–2023), and the metadata of a painting that is part of the series, e.g. *Mirage I* (2022).

There are also properties that are useful to describe the context of a painting in the schemas. Both schemas have a property called ‘mentions’, with which I am able to make a reference to my other painting *Interface L3* (2014) – the reference work for *Frankenstein* (2022). The schemas also have a property called ‘discussionUrl’, which can be used to offer a link to a web page that shows a discussion about the painting (Schema.org, 2024).

Lastly, both schemas can further embrace several other aspects of a physical painting in relation to its exhibition as properties, e.g., preferred lighting conditions, colour of the hanging wall and specific height from the floor for hanging. As discussed in the previous chapter, these can be important parts of a physical painting to be considered when constructing an online proxy for the painting.

Reasons for the painter to use metadata schemas

I consider online search engines as ‘automated services’ that are capable of processing the ‘machine-readable Web content’ on their users’ behalf in the ‘Semantic Web’ – today’s internet (Berners-Lee, Hendler & Lassila, 2001, p.42). Collaborating with these ‘automated services’, metadata plays the following key roles in presenting a physical painting in its context as an artwork online.

Metadata can contain and convey a painting’s descriptive, administrative and structural details, each corresponding to a property in a metadata schema for painting (Pomerantz, 2015, pp.17-18). By publishing the metadata of a painting in machine-readable format on their websites, a painter can give the search engines accurate information about the painting and its relationship with its online content. The uploaded metadata then functions as a signpost for the ‘automated services’ to guide those who are searching for the painting to the online content of the artwork on the painter’s behalf. In other words, annotating the online content relating to a painting with the information increases the opportunity for search engine users to retrieve the most relevant online content and information about the artwork.

From the perspective of the painter, metadata also increases their chance of being accurately credited on the internet. Specifically, Schema.org’s schemas have a designated property that specifies copyright information, which would allow search engines and their users to identify whether they can use the related content, and if so, ‘under what conditions’ (ibid., p.95). In this way, metadata provides the information necessary to establish the context of the digital content of a painting. As discussed in Chapter 2, social media companies enjoy exclusive power to manipulate the context of user-created content for their own purposes in their online platforms. It would therefore be useful for painters to have a workable option to reduce their dependence on the platforms for promoting their art practice and to present their paintings to an online audience in a context that is closer to their intention of the artworks.

My approach here requires neither new, sophisticated technology nor complicated application. This is mainly because metadata is ‘a common language’ in the sense

that it is both human readable/writable (plain English) and machine readable (Web Standard) to interface between a physical painting and its associated digital content made in various media formats (Haraway, 1991, p.163). As shown earlier in this subchapter, organising a painting's metadata is like filling in a standard questionnaire about a painting. There are helpful tools freely available online to employ metadata schemas.

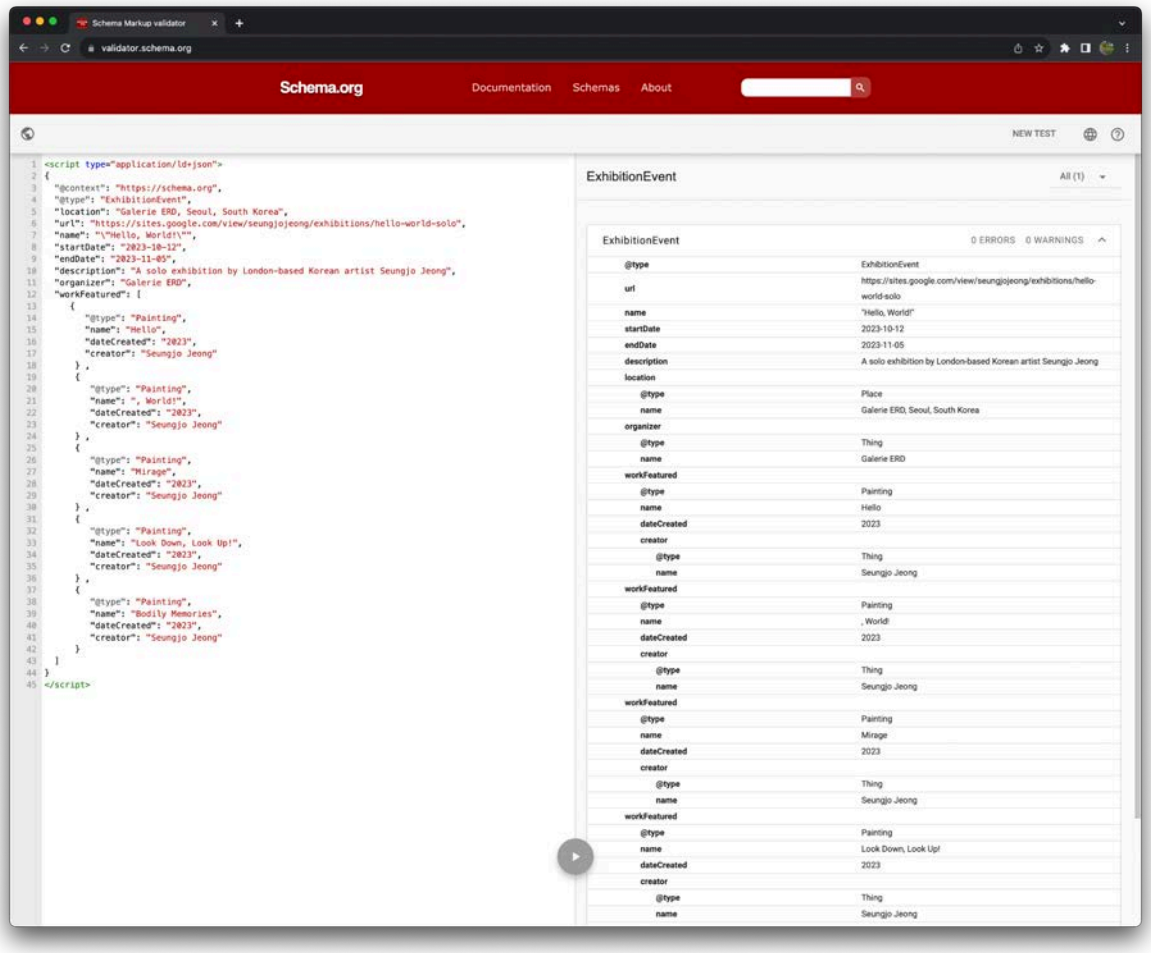

Figure 5C. Screenshot of the result page of validating the structured data of my 2023 solo exhibition on Schema.org

For instance, as shown in the screenshot above, Schema.org provides an online validator with which it is easy to test whether the syntax of the metadata schema that has been written is correct (Schema.org, 2024). It is also possible to check how the structured data would appear on a computer screen by using another online tool offered by Google, 'Rich Results Test' (Google, n.d.).

5.3 Painting as an autonomous online network

Hito Steyerl asserts that the ‘networked space is itself a medium [...] It is a form of life (and death) that contains, sublates, and archives all previous forms of media’ (Steyerl, 2013). Steyerl concludes that ‘The all-out internet condition is not an interface but an environment’ (ibid.). I take this to mean that the internet should not be seen as a user interface in a fixed form, like a web browser, but rather as an ever-changing environment bustling with diverse content, including old and new art mediums, that is in a state of flux through the network.

In this live environment, metadata can act as a ‘joint’ to connect the online content relating to a painting, regardless of the geographical location of the server(s), where the digital content is hosted either separately or together (Galloway, 2021, p.130). By working closely with search engines, the joint can form a hybrid network between an analogue painting and its digital content, creating an online proxy for the painting.

The online proxy also has limitations. This can be seen most notably in the network: ‘the expansion of digitality has enormously increased the *material* dimension of’ the network (Latour, 2011a, p.802). As discussed in the previous chapter, adopting a new digital format, such as the 3D scan, to the network increases the proxy’s dependence on related technological infrastructure, which may take time to resolve.

However, as a network with structural ‘flexibility’, the online proxy can ‘reconfigure according to changing environments and retain’ its role in the painter’s art practice ‘while changing [its] components’ (Castells, 2009, p.23). Simply put, it is possible to add new digital content to the existing network of a painting at any time by sharing the painting’s metadata with its other online content. The same is true in reverse. Any element of the current online content can be dropped from the network for any reason, at any time. In this way, an online proxy for a physical painting can autonomously ‘expand or shrink in size with little disruption’ (ibid.), minimising the burden for the painter of maintaining the network.

By publishing relevant information about their paintings and exhibitions in the form of metadata schemas on their websites, painters can now build online proxies for their

physical work, which search engines will interpret as the context of the artworks and exhibitions for online viewers on the painters' behalf. Unlike a physical painting, its online proxy is a digital format, which means 'a heterogeneous and often provisional structure that channels content' (Joselit, 2013, p.52). The online proxy can transform to adapt to an operating environment that changes over time, thanks to its capacity, which 'regulate[s] image currencies (image power) by modulating their force, speed, and clarity' across the internet (ibid., p.53).

Conclusion

6.1 Research questions

The following is a summary of how I examined my research questions through the project discussed in this thesis. Although the three questions were raised consecutively, they were all entangled, as I investigated them at different paces and in different ways, as described below.[131]

To empirically examine *how to re-articulate the act of painting from a digital perspective*, I attempted to translate my painting process into a procedural programming language from the perspective of computational thinking. Although the translation showed the limitations of the language in describing the act of painting, the act of translating has taught me the fundamental difference between painting and programming. Despite their similarities, in that they both necessarily involve a large number of recursive procedures and depend on well-tested connections in their respective networks, painting often unfolds in a spontaneous and non-linear way. This untranslatable aspect of painting led me to continue to find a language for understanding painting in the digital context.

Responding to the post-pandemic era, characterised by our increasing dependency on digital interfaces and networks, I examined *how my painting practice could correlate positively with interfaces and networks in a post-COVID contemporary context*. I adopted the following two notions as alternatives for computational thinking. Ash's (2015) idea of the interface as objects helped me to address the physical process of painting and embrace digital interfaces as new components of the interface for my painting practice. Latour's (2011) idea of the network has been effective not only in tracing the non-linear trajectory of the development of painting but also in understanding painting (both the act and artwork) as a form of network.

[131] In this sense, my questions are like plants in a pot that grow at different speeds.

To address the way the context of user-created content is often misplaced, I examined *how to build the online context of a physical painting*. I conceived an online proxy for a painting in the form of a network to embrace both a painting and its associated online content in various digital formats. I used a metadata schema as a language to inform search engines so that they can contextualise the online content relating to a painting based on the painting's metadata. In this sense, creating the proxy is a practical way to build the online context of a painting by utilising the automated capacity of the Internet. It can also be seen as developing a reciprocal relationship between humans and machines by using the language that both can easily understand and use.

6.2 Findings

My findings from this research can be summarised into three points.

1) The research proposes new terms which can be used to articulate a new conceptual framework to evaluate painting within the contemporary digital context. *Transduction* is helpful to describe the physical process of painting. *Joint* builds a structural idea to manage the coexistence of a painting and the online content associated with the painting in the form of a hybrid network by building connections between them. *Interoperability* provides a flexible framework to accommodate the differences in format and location among various online content relating to a painting. The *metadata schema* is the optimum language with which to build the online context of paintings via the proxy for both the painter and the viewer.

2) Creating the proxy is a workable option for the painter to build the online context of their work while reducing their reliance on social media platforms. Paintings are digitised in various formats and published on different websites and platforms at different times. In this sense, making the proxy in a flexible but interrelated form could represent and address a painting's current relationship with its associated online content. From my experience of digitising my 2023 solo exhibition in multiple image and text formats, I learnt that using multiple formats together would ease the discrepancy between a painting and its online image, since the digital formats can complement each other. The collaboration of the proxy with search engines can provide extensive and nuanced information about a painting for those who use Google, for example, to search for the work.

3) Although my painting practice has been used as the central method in this research, it has also, in return, been informed by the progress of the research. Through this reciprocal relation, the development in the practice has furthered the research. For instance, while examining the correlation between the material sustainability of practising painting and global supply networks, I chanced on a way to recycle a by-product of the practice, linen offcuts, for painting. This seemingly small development in the practice, which I was able to examine through Ash's notion

of transduction, prompted me to look more closely into the correlation between the practice and ideas of networks and interfaces.

6.3 The paintings as an outcome of the research

The paintings that I made to examine the research questions are offered as an outcome of the research. They explore the physicality of the canvas in relation to its possible digital counterparts such as the digital image, the computer screen and the internet. Specifically, *Interface T6* (2019) exemplifies the stackability of the canvas. *Interface L* (2020) examines the relationship between a painted image and its ground. By mapping the screen onto the canvas, the polyptych painting demonstrates how to facilitate an interdependent structure of painted images by using an underlying framework, which is applicable to the relationship between online images and the internet. *Interface V* (2021) brings the painted image out of the canvas by exploiting the tooth of the ground as aesthetic noise. *Anderson* (2021) and *Interface Shipping* (2021) reconsider a stretched canvas as a module[132] from both material and immaterial perspectives. By emulating the way digital layering works, *Interface Shipping* (2021) disassembles a physical painting, as if peeling off painted layers from the ground of *Anderson* (2021), working like Photoshop. *Preloved* (2022) draws attention to the material ground of painting and its online representation by exploring what the seams on the sewn canvas bring to the painting. *Frankenstein* (2022) extends the material ground of painting by linking across time and place, which is comparable to the way online content can be linked with each other via the internet. *Hello* (2023) and *, World!* (2023) exploit the walls surrounding their canvases as their respective grounds in a way that expands the polyptych paintings beyond the physical boundaries of their canvases. In this way, these paintings collectively provide multiple viewpoints on the ground of painting.

The sewn-canvas paintings, including *Preloved* (2022) and *Frankenstein* (2022), feature a unique set of seams, the joints of linen patches, on each canvas. While the tangible threads facilitate and present the transformation of the material ground, they also draw attention to, by contrasting with, the increasing seamlessness between our physical and digital worlds. Within this technological context, the paintings jointly serve as a blueprint for extending the ground of painting online.

[132] In the paintings, I take the canvas as a module made in a standardised manner in the sense that it is editable, replaceable and duplicable like a digital layer in Photoshop.

6.4 Relevance to the field and beyond

My development of the proxy was largely motivated by my personal experiences of struggling to keep up with the changing context of online image-sharing platforms. I hope my research will be a timely reference for those who share similar interests in seeking alternative ways of presenting their art practice online in a digital form. The proxy offers an example of the potential of reassembling existing web technologies and digital resources. Given the readiness of Schema.org's metadata schemas for many different kinds of art forms, my idea of building an online proxy for a painting is transferable to the online presentation of other forms of art.

Painting is a network that is operated by the painter's conflicting actions of building reliable links in the network and simultaneously breaking them to make potentially precarious connections in and beyond the network. By doing so, the painter can both encounter potential and unearth problems which reside in the network which are yet uncharted. This conceptual framework is offered to painters as a way of remapping a painting practice into a distributed network. I therefore plan to continue to update the framework to address the rapid development of relevant technologies, including augmented and virtual reality and artificial intelligence (AI).[133]

Finding, learning and using a language that suits both humans and machines is of increasing importance in the age of conversational AI.[134] Building the online context of a painting by working closely with search engines exemplifies the mutual benefit of making a conversation in a language that both parties can easily understand and use.

[133] Although AI is beyond the scope of this research, this rapidly evolving technology has increasing relevance to discussions in the research. For instance, AI-developing companies are voraciously collecting images along with textual information attached to the images from various websites on the Internet, to compile a dataset of image-text pairs for training their programmes (Baio, 2022).
[134] Lanier asserts that 'What we call AI should never be understood as an alternative to people, but instead as a mislabeled new channel of value *between* real people' (Lanier, 2018, p.100). Safiya Umoja Noble, an algorithm researcher, also points out that 'the consciousness embedded in artificial intelligence' 'is in fact a product of our own collective creation' (Noble, 2021, p.211).

Appendix I: The metadata schemas of ‘“Hello, World!”’ (2023)

This appendix presents the metadata schemas of my latest solo exhibition ‘“Hello, World!”’ and paintings featured in the exhibition.

The exhibition’s visual and textual information can be transformed into metadata by using the schema for Exhibition Event as below:

```
<script type="application/ld+json">
{
  "@context": "https://schema.org",
  "@type": "ExhibitionEvent",
  "url": "https://sites.google.com/view/seungjojeong/exhibitions/hello-world",
  "name": "\"Hello, World!\"",
  "location": "Galerie ERD, Seoul, South Korea",
  "startDate": "2023-10-12",
  "endDate": "2023-11-05",
  "description": "A solo exhibition by London-based Korean artist Seungjo Jeong",
  "workFeatured": [
    {
      "@type": "Painting",
      "name": "Hello",
      "dateCreated": "2023",
      "creator": {
        "@type": "Person",
        "name": "Seungjo Jeong",
        "Url”: "www.instagram.com/seungjo.jeong"
       }
     } ,
     {
       "@type": "Painting",
```

```
    "name": ", World!",
    "dateCreated": "2023",
    "creator": {
      "@type": "Person",
      "name": "Seungjo Jeong"
    }
  } ,
  {
    "@type": "Painting",
    "name": "Mirage",
    "dateCreated": "2023",
    "creator": {
      "@type": "Person",
      "name": "Seungjo Jeong"
    }
  } ,
  {
     "@type": "Painting",
     "name": "Look Down, Look Up!",
     "dateCreated": "2023",
     "creator": {
       "@type": "Person",
       "name": "Seungjo Jeong"
    }
  } ,
  {
    "@type": "Painting",
    "name": "Bodily Memories",
    "dateCreated": "2023",
    "creator": {
      "@type": "Person",
      "name": "Seungjo Jeong"
    }
  }
```

```
  ]
}
</script>
```

Figure 7A. Installation view of *Hello* (2023)

Hello (2023) is part of the exhibition and its visual and textual information can be organised in the form of metadata by using the schema for Visual Artwork as below:

```
<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2023",
  "artform": "Painting",
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": "Hello",
```

```
  "image":
"https://lh4.googleusercontent.com/9iLWtpMRftCMWiy7jARVOa5zDgiDJjQ3sI-Eq93v
JbPh9a3yNZO-nqFh2c80D9KltTaO1q053T6i4XfUHzHaM5jSIVYt_sU_GHiXDqAv-8n
_mx4Dh6otdO-NcqpyPQJs4Q=w1280",
  "artMedium": "Acrylic" ,
  "artworkSurface": "linen" ,
  "width": [
  {
     "@type": "Distance",
     "name": "670 cm"
   }
] ,
   "height": [
  {
     "@type": "Distance",
     "name": "160 cm"
   }
] ,
   "depth": [
  {
     "@type": "Distance",
     "name": "4 cm"
   }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
    "@type": "ExhibitionEvent",
    "name": "\"Hello, World!\""
  }
}
</script>
```

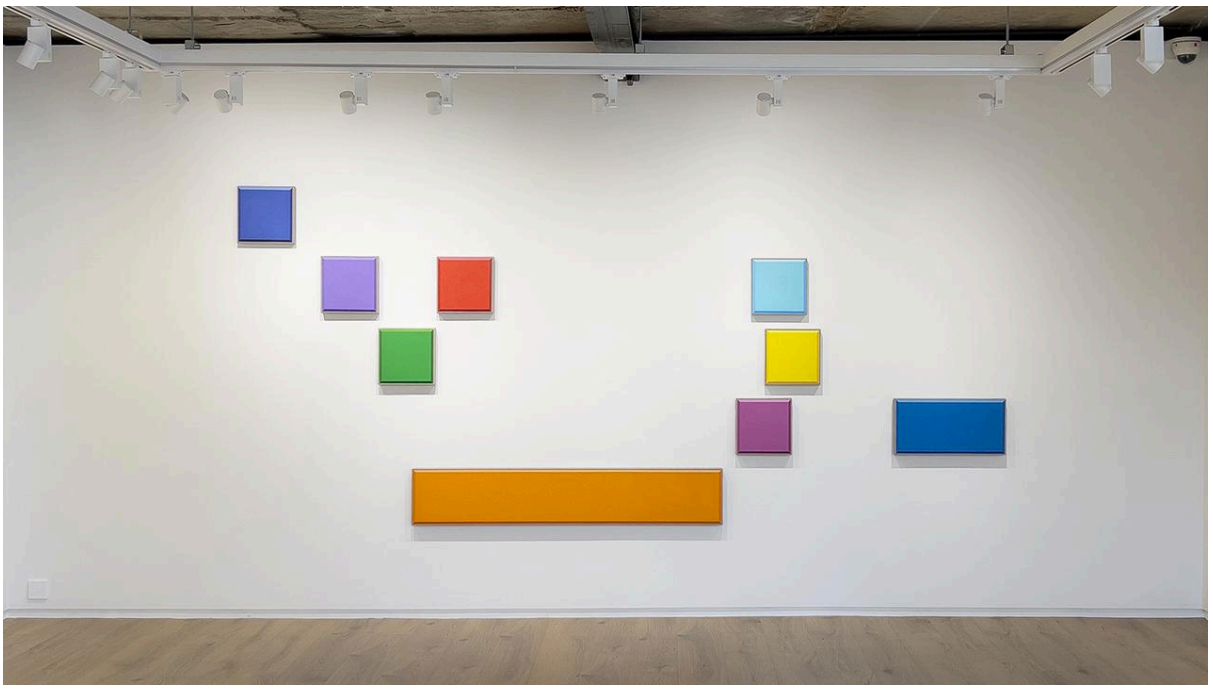

Figure 7B. Installation view of *, World!* (2023)

<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2023",
  "artform": "Painting",
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": ", World!",
  "image":
"https://lh5.googleusercontent.com/M-INzqJvjGHzhpcJ6o_WZA3Oj4r_d6TcpdobMG
Wj_u7RB7HtJnwPbYZ7KGsmNPiFCtKKFmHtcMzhaDYEnj70ZNwgMnlKPA7AAnK5
wnE5x3shuXoaQv3Vpud8OhkzVKSBtg=w1280",
  "artMedium": "Acrylic" ,

```
  "artworkSurface": "linen" ,
  "width": [
  {
      "@type": "Distance",
      "name": "350 cm"
   }
] ,
   "height": [
  {
      "@type": "Distance",
      "name": "150 cm"
   }
] ,
   "depth": [
  {
      "@type": "Distance",
      "name": "4 cm"
   }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
    "@type": "ExhibitionEvent",
    "name": "\"Hello, World!\""
  }
}
</script>
```

Figure 7C. Installation view of *Mirage* (2023)

<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2023",
  "artform": "Painting",
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": "Mirage",
  "image":
"https://lh6.googleusercontent.com/Yf5dFC_m9mXl2zZixHc6jtT3ZI2TEkDqSyUzId2ijOWGbjudapuDYN4nlBxO2jxxgMizVoxUN7-pP5hZBE_hv_i6i2OBRr6IMFNyJc5v1bOcSTHE3uK-h5ziBIxFHqYudQ=w1280",
  "artMedium": "Acrylic" ,
  "artworkSurface": "linen" ,

```
  "width": [
  {
      "@type": "Distance",
      "name": "40 cm"
   }
] ,
   "height": [
  {
      "@type": "Distance",
      "name": "50 cm"
   }
] ,
   "depth": [
  {
      "@type": "Distance",
      "name": "4 cm"
   }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
    "@type": "ExhibitionEvent",
    "name": "\"Hello, World!\""
  }
}
```

Figure 7D. Installation view of *Look Down, Look Up!* (2023)

<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2023",
  "artform": "Painting",
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": "Look Down, Look Up!",
  "image":
"https://lh4.googleusercontent.com/WfikFPPR_6c3r7JEPkC2u1INEDv-A_MmE405Wg4OlvHaZiGnDXQKrW-9QweJ23n2UmSzvU0Dc8FiqzkEKCSB0ULbDUBcvGYH5tgILeLSVbPz4l0uWbfVfcgzlB_um_y7iA=w1280",
  "artMedium": "Acrylic" ,
  "artworkSurface": "linen" ,
  "width": [

```
  {
     "@type": "Distance",
     "name": "450 cm"
   }
] ,
   "height": [
  {
     "@type": "Distance",
     "name": "160 cm"
   }
] ,
   "depth": [
  {
     "@type": "Distance",
     "name": "4 cm"
   }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
    "@type": "ExhibitionEvent",
    "name": "\"Hello, World!\""
  }
}
```

Figure 7E. Installation view of *Bodily Memories* (2023)

<script type="application/ld+json">
{
  "@context": "https://schema.org/",
  "@type": "VisualArtwork",
  "dateCreated": "2023",
  "artform": "Painting",
  "artist": {
    "@type": "Person",
    "name": "Seungjo Jeong"
  },
  "name": "Bodily Memories",
  "image":
"https://lh5.googleusercontent.com/vWEDvFB_JC-2Zqh2alb9LZ4MC4Mx_c_jjXlyY3F7ZsSLvT3HI3KE9rLJWq4sNVtcJyShAshO32hkkwMfXBmktk0RhnQK21eqiTe_cN0_w6tYSl8UhF9pC3gv72cmxZEI1Q=w1280",
  "artMedium": "Acrylic" ,
  "artworkSurface": "linen" ,

```
  "width": [
  {
      "@type": "Distance",
      "name": "50 cm"
   }
] ,
   "height": [
  {
      "@type": "Distance",
      "name": "90 cm"
   }
] ,
   "depth": [
  {
      "@type": "Distance",
      "name": "4 cm"
   }
] ,
  "locationCreated": {
    "@type": "AdministrativeArea",
    "name": "London"
  } ,
   "subjectOf": {
    "@type": "ExhibitionEvent",
    "name": "\"Hello, World!\""
  }
}
```

Appendix II: The translation of my painting process in Visual Basic

This appendix contains the translation of my painting process in a programming language called Visual Basic that I used while working as a software engineer.

```
Public Module Windows
    ' When this button is clicked, flip between a GUI window and a code window
    Private Sub Button1_Click() Handles Button1.Click
        ' Declare a variable: a GUI window = True, a code window = False
        Dim bWindow As Bloolean
        ' Declare a variable: a window name
        Dim sWindow As String
        ' Get a current window
        If GetCurrentWindow (bWindow) Then
            ' First, close a current window
            If CloseWindow (bWindow) Then
                ' Then, open the other window
                If bWindow Then
                    If OpenCodeWindow Then
                        bWindow = False
                    Else
                        Return False
                    End if
                Else
                    If OpenGUIWindow Then
                        bWindow = True
                    Else
                        Return False
                    End if
                End if
                ' Get the name of a current window
                sWindow = GetWindowName (bWindow)
                ' Prompt a confirmation message with the window name
                MessageBox.Show(sender.Name & sWindow)
```

```
                Else
                    ' Prompt an error message
                    MessageBox.Show(sender.Name & “Fail to close window”)
                End if
            Else
                ' Prompt an error message
                MessageBox.Show(sender.Name & “No Window open”)
            End if
        End Sub
End Module
```

Modules I (The painting)

```
Public Module The painting

    Function ChooseSubjectMatter(ByVal sObjectName As String) As Boolean

        ' Consider if the object shares similarities with the painting-canvas
        If IsObjectSimilarTPC (sObjectName) Then
            ' Consider if the shape of the object fits into the rectangular frame
            If IsObjectRectanglar(sObjectName) Then

                ' Entitle the painting based on the object name
                g_sPaintingName = EntitlePainting(sObjectName)
                Return True
            Else
                Return False
            End if
        Else
            Return False
        End if

    End Function

    Function IsObjectRectanglar(ByVal sObjectName As String) As Boolean

        Dim bRightAngles As Boolean
```

```
        ' Check if all the corners of the object are right angles.
        bRightAngles = AreAllCornersRghtAngles(sObjectName)
        If bRightAngles Then
            Return True
        Else
            Return False
        End if

    End Function

End Module
```

Modules II (Translation)

```
Public Module Translation

    ' Translate the painting process.
    Function TranslateByProcess(ByVal sPaintingName As String) As Boolean

        ' Declare related variables.
        Dim iNumProcess As Integer

        ' Count the number of the processes of making the painting.
        iNumProcess = CountProcess(sPaintingName)

        If iNumProcess > 0 Then
            ' Translate the processes one by one
            For index As Integer = 1 To iNumProcess
                ' Get Nth process of making the painting
                sProcessName = GetProcess(sPaintingName)
                ' Translate the sub-processes of each process
                If TranslateBySubProcess(sProcessName) Then
                ' Continue.
                Else
                    Return False
                End If
```

```
            Next
            Return True
        Else
            Return False
        End If

End Function

Function TranslateBySubProcess(ByVal sProcessName As String) As Boolean

        ' Declare related variables
        Dim iNumSubProcess As Integer
        Dim sSubProcessName As String

        ' Count the number of the sub-processes of a given process
        iNumSubProcess = CountSubProcess(sProcessName)

        If iNumSubProcess > 0 Then
            ' Translate each sub-process one after another
            For index As Integer = 1 To iNumSubProcess
                ' Get Nth sub-process of the process
                sSubProcessName = GetSubProcess(index)
                ' Check if the sub-process is translatable or not
                If IsTranslatable(sSubProcessName) Then
                    ' Translate the sub-process
                    TranslateSubProcess(sSubProcessName)
                ' If the sub-process is untranslatable
                Else
                    ' Mark untranslatable sub-process for review later
                    MarkUntraslatableSubProcess(sSubProcessName)
                End If
            Next
        Else
            Return False
        End If

        Return True
```

```
    End Function

End Module
```

Modules III (before painting)

```
Public Module Cutting

    ' Cut linen to measure
    Function CutToMeasure(ByVal iHeight As Integer, ByVal iWidth As Integer) As
    Boolean

        ' Declare a variable, the ID of linen, 0 = a roll of linen
        Dim iLinenID As Integer

        ' Check if there is a piece of linen large enough to fit the size
        If FindPieceLinen(iHeight, iWidth, iLinenID) Then
            ' Cut to measure by using the piece of linen
            CutLinenToMeasure(iHeight, iWidth, iLinenID)
            Return True
        ' If there is no proper-sized piece of linen found
        Else
            ' Cut to measure by, instead, using a roll of linen
            If CutLinenToMeasure(iHeight, iWidth, iLinenID) Then
                Return True
            Else
                Return False
            End if
        End If

    End Function

End Module
```

```
Public Module Priming

    Function PrimeCanvas(ByVal iCanvasID As Integer) As Bloolean

        ' how long it will take to dry a wet canvas
        Dim iDryingTime As Integer
        ' a proportion between gesso and water
        Dim iProportion As Integer

        ' Check the condition of a canvas to decide the strength of gesso.
        iProportion = CheckRawCanvas

        ' Prepare gesso by mixing with water.
        If PrepareGesso(iProportion) Then
            ' Apply gesso on a canvas and get the expected drying time.
            If ApplyGesso(iCanvasID, iDryingTime) Then
                ' Dry a gessoed canvas for the duration.
                If DryCanvas(iCanvasID, iDryingTime) Then
                    Return True
                Else
                    Return False
                End If
            Else
                Return False
            End If
        Else
            Return False
        End If

    End Function

End Module
```

Modules IV (during painting)

```
Public Module Hanging
```

```
' Declare a public variable, my eye level.
Public g_iEyeLevel As Integer
' a public variable, the height of the painting-canvas.
Public g_iCanvasHeight As Integer
' a public constant, the max hanging height, 250cm, the minimum height, 50cm.
Public Const gc_iMaxHeight As Integer = 250
Public Const gc_iMinHeight As Integer = 50

' Change the hanging height of the painting-canvas.
Function ChangeCanvasHeight(ByVal iDesiredHeight As Integer) As Bloolean

        Dim iNailHeight As Integer
        Dim bNailReady As Bloolean

        ' Calculate the height of a nail based on the desired height.
        iNailHeight = CalculateNailHeight(iDesiredHeight)
        If iNailHeight > 0 Then
                ' Hammer a nail at the desired height.
                bNailReady = HammerNail(iNailHeight)
                If bNailReady Then
                        ' Then, hang the painting-canvas on a wall.
                        Return HangCanvas(iNailHeight)
                Else
                        Return False
                End If
        End If

End Function

Function CalculateNailHeight(ByVal iDesiredHeight As Integer) As Integer

        Dim iNailHeight As Integer

        ' Validate the input variable.
        If iDesiredHeight > 0 Then
                ' Calculate the height of a nail
                '  = my eye level + the painting-canvas's height - the desired height
```

```
                iNailHeight = g_iEyeLevel + g_iCanvasHeight - iDesiredHeight
                Return iNailHeight
            Else
                Return 0
            End If

        End Function

        Function HammerNail(ByVal iHeight As Integer) As Bloolean

            ' Validate the input variable.
            If iHeight >= gc_iMinHeight And iHeight <= gc_iMaxHeight Then
                ' Hammer a nail at the height.
                Return PutNail(iHeight)
            Else
                Return False
            End If

        End Function

End Module
```

Modules V (after painting)

```
Public Module Storing

    ' Store or unstretch the painting-canvas.
    Function StorePaintingCanvas(ByVal iPaintingID As Integer) As Bloolean
        Dim iLength As Integer
        Dim iWidth As Integer
        ' Check if the painting is to be used for any reasons.
        If IsPaintingToBeUsed(iPaintingID) Then
            ' Keep the painting-canvas as it is.
            Return KeepPaintingCanvas(iPaintingID)
        Else
            ' Unstretch the painting-canvas.
            If UnstretchPaintingCanvas(iPaintingID, iLength, iWidth) Then
```

```
                    ' First, store an unstretched canvas.
                    If StorePaintedCanvas(iPaintingID, iLength, iWidth) Then
                        ' Then, store disassembled stretchers.
                        Return StoreStretcherbars(iLength, iWidth)
                    Else
                        Return False
                    End If
                Else
                    Return False
                End If
            End If
        End Function

        ' Check if the painting-canvas is necessary to be kept as it is.
        Function IsPaintingToBeUsed(ByVal iPaintingID As Integer) As Bloolean
            ' Check if it is to be exhibited soon.
            If IsPaintingToBeExhibited(iPaintingID) Then
                Return True
            ' Check if it would be a reference for making a new painting.
            ElseIf IsPaintingToBeReference(iPaintingID) Then
                Return True
            Else
                Return False
            End If
        End Function

End Module
```

Appendix III: Paintings (2018~2023)

This appendix contains images of paintings that I made throughout the research period.

Figure 9A. *Interface V* (2018) Acrylic on linen, 66 x 66 cm

Figure 9B. *Interface V* (2018) Acrylic on linen, 90 x 50 cm

Figure 9C. *Interface V* (2019) Acrylic on linen, 45 x 50 cm

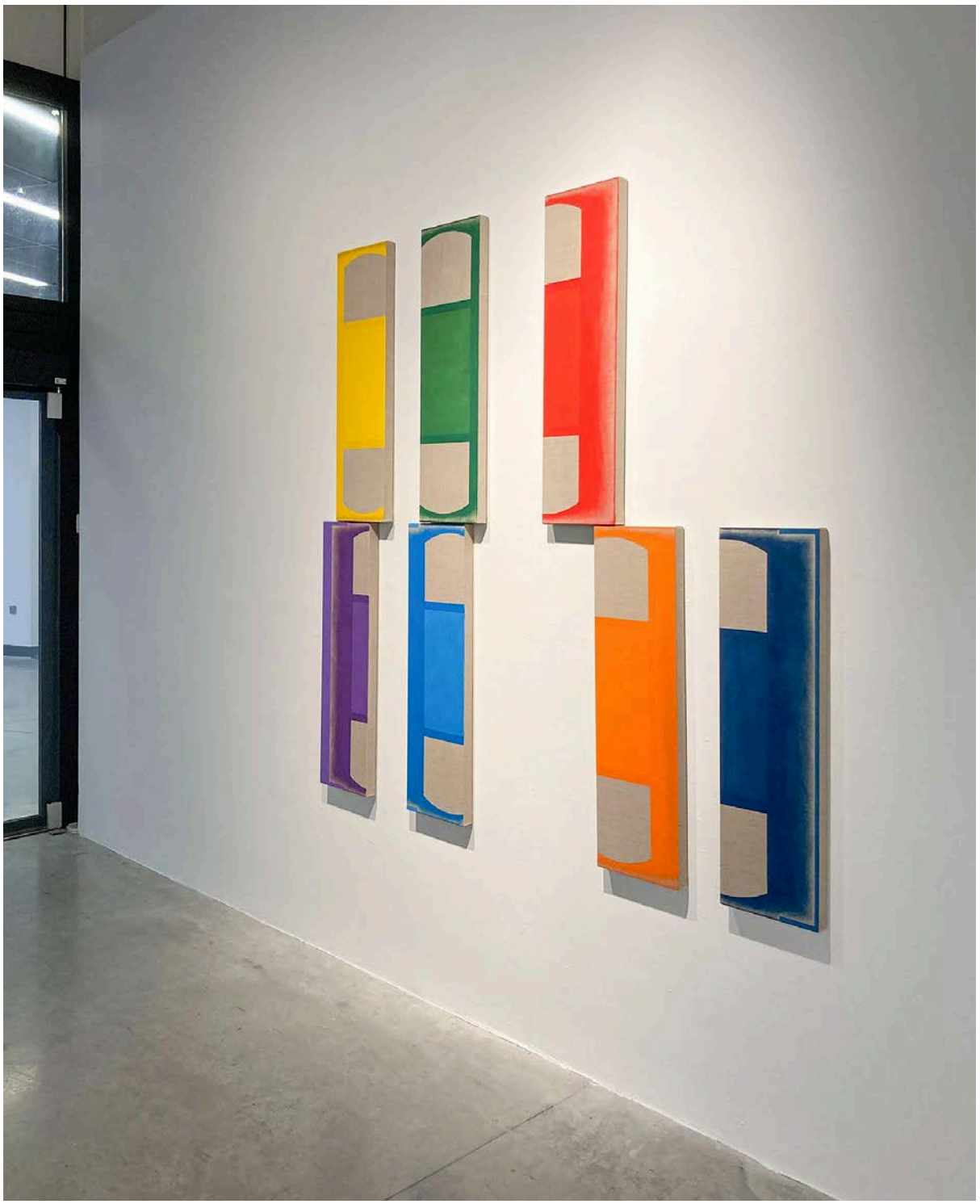

Figure 9D. Installation view of *Interface V7* (2019) at ‘Plymouth Contemporary 2021’ at The Levinsky Gallery, University of Plymouth, Plymouth

Figure 9E. *Interface T* (2019) Acrylic on linen, 55 x 75 cm

Figure 9F. *Interface T6* (2019) Acrylic on linen, approx. 61 x 81 cm each (6 parts)

Installation view at ‘There's something lurking in the shadows that might be interesting’ (2019) at the Dyson Gallery, Royal College of Art, London

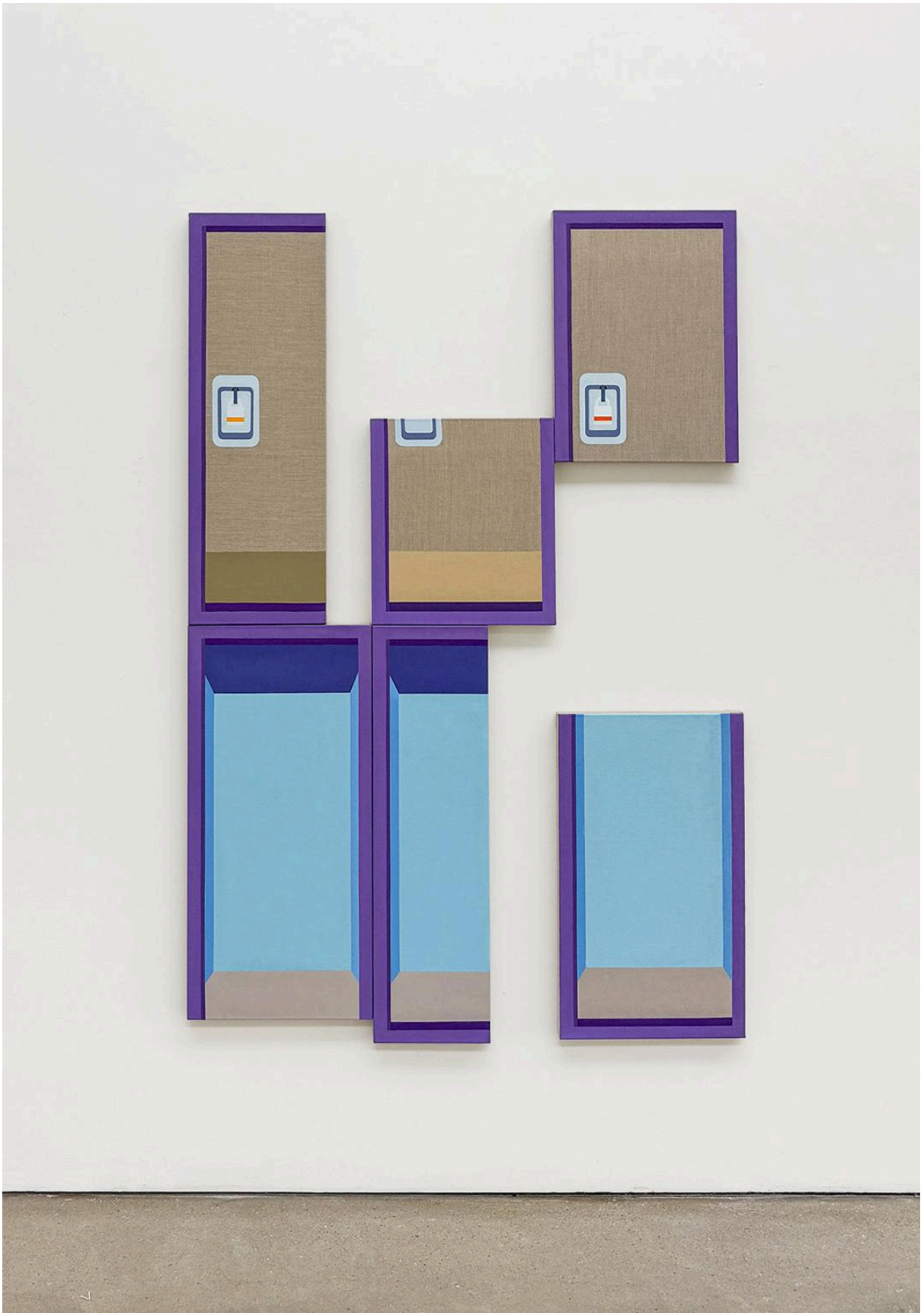

Figure 9G. *Interface L* (2020) Acrylic on linen, 180 x 120 cm (6 parts)

Figure 9H. *Interface AS* (2020) Acrylic on linen, 130 x 50 cm

Figure 9l. *Interface V* (2021) Acrylic on linen, 91 x 51 cm

Figure 9J. *Interface CT* (2021) Acrylic on linen, 55 x 90 cm each (2 parts)

Figure 9K. *Anderson* (2021) Acrylic on linen, 50 x 40 cm each (4 parts)

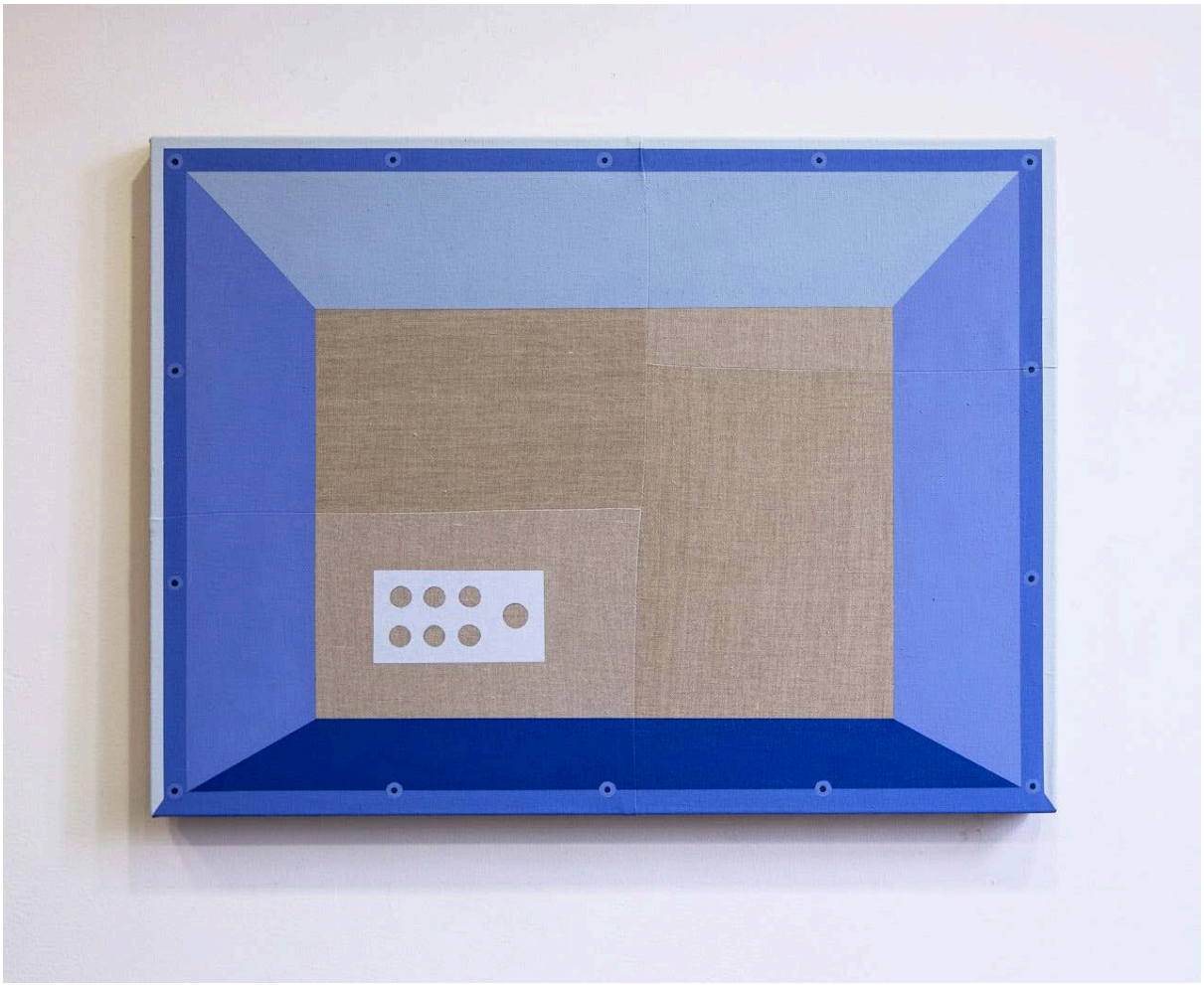

Figure 9L. *Preloved* II (2022) Acrylic on linen, 60 x 80 cm

Figure 9M. *Hear Ear Here* (2022) Acrylic on linen, 101 x 41 cm each (L/R), 76 x 36 cm (M)

Figure 9N. *Frankenstein* (2022) Acrylic on linen, 91 x 41 cm each (3 parts)

Figure 9O. *My Wife Was A Pro-Gamer* (2022) Acrylic on linen, 60 x 25 cm each (2 parts)

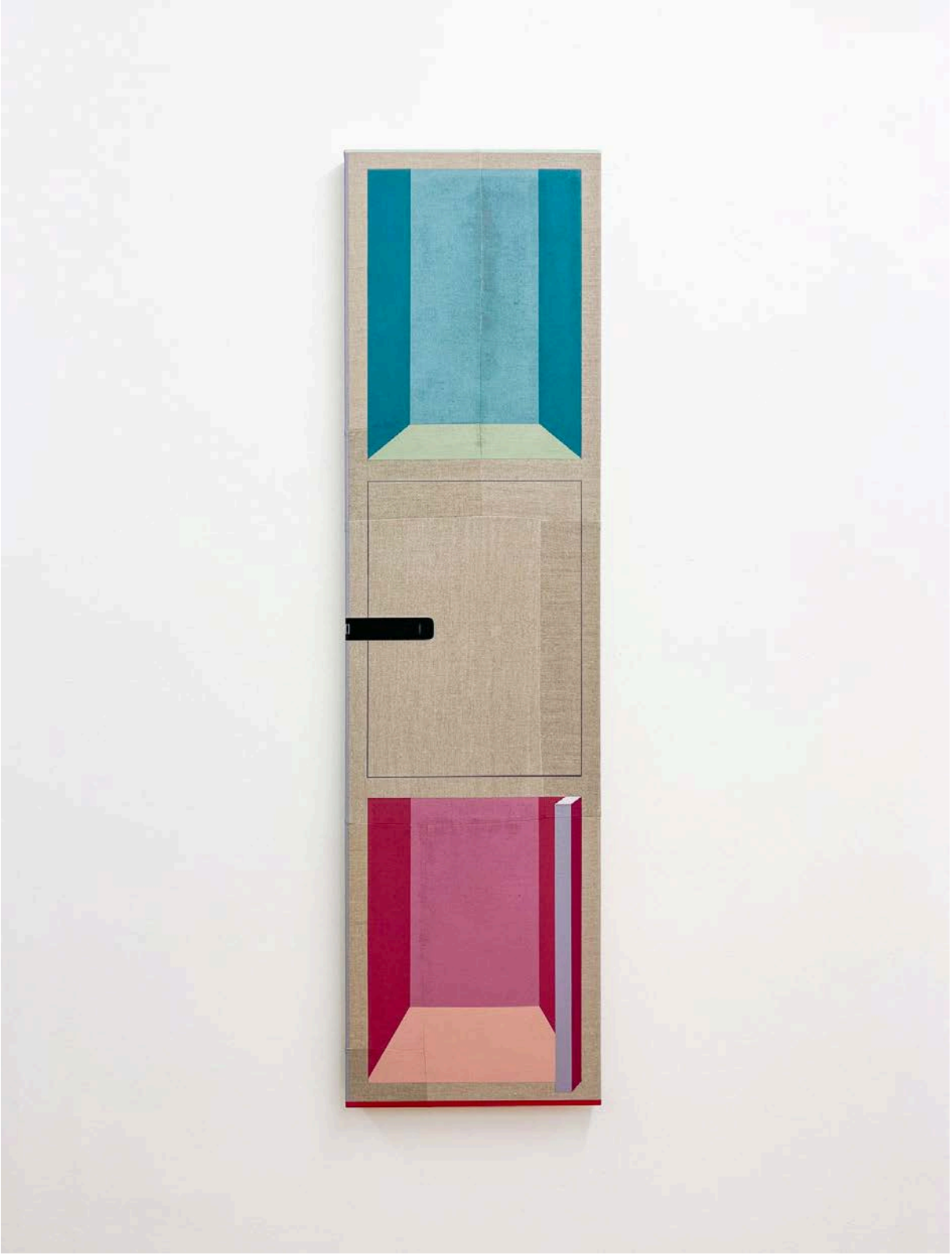

Figure 9P. *T.E.S.* (2023) Acrylic on linen, 150 x 40 cm

Figure 9Q. *Mirage* (2023) Acrylic on linen, 50 x 40 cm each (2 parts)

Figure 9R. *Preloved* (2022) and *Interface AS* (2020)

Installation view at ‘Seungjo Jeong Viva Exhibition’ (2024)
Royal College of Art, London

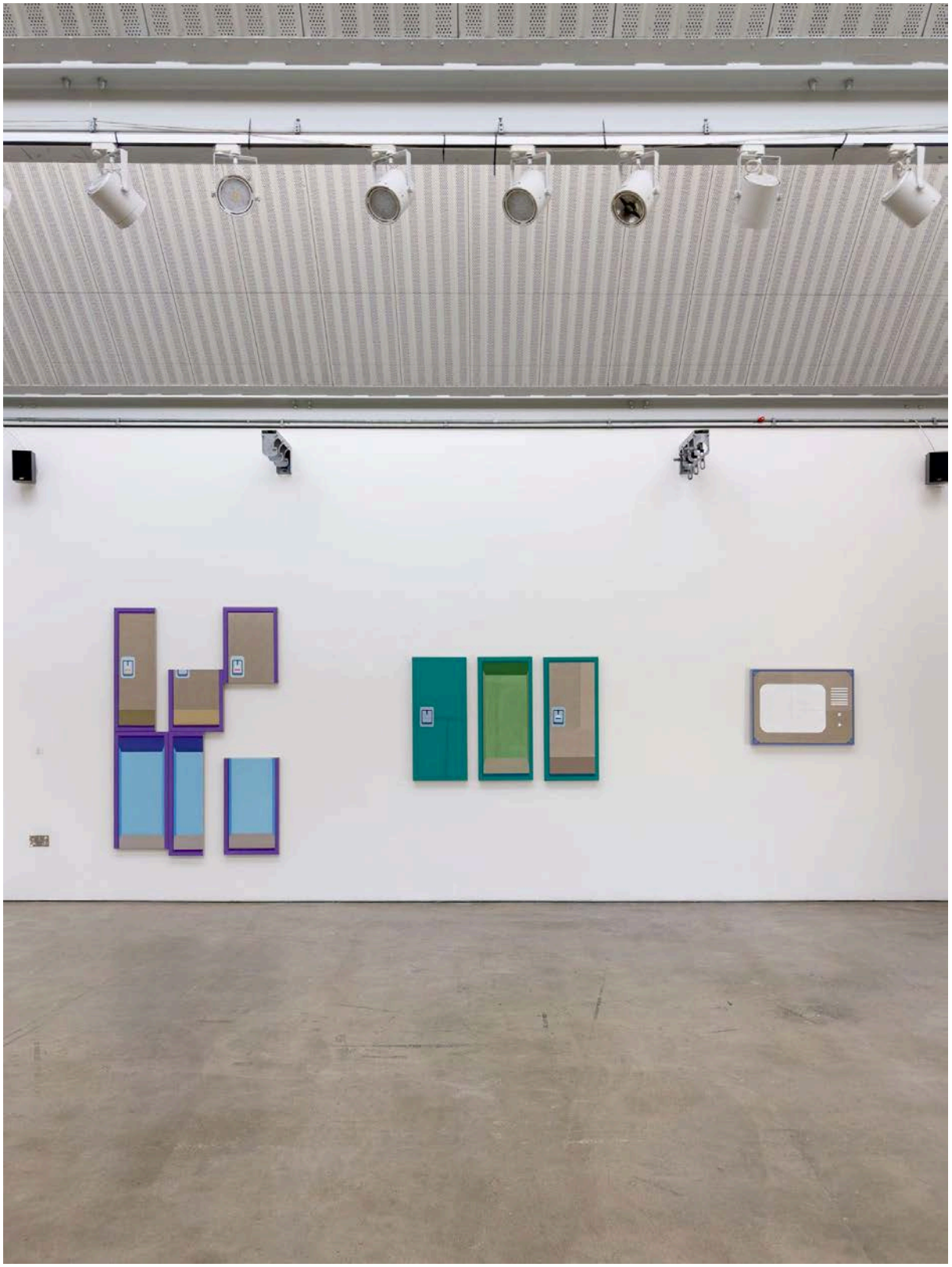

Figure 9S. *Interface L* (2020), *Frankenstein* (2022) and *Preloved* (2022)

Installation view at ‘Seungjo Jeong Viva Exhibition’ (2024)
Royal College of Art, London

Figure 9T. *Interface Shipping* (2021), *Amy* (2023) and *Mirage* (2023)

Installation view at ‘Seungjo Jeong Viva Exhibition’ (2024)
Royal College of Art, London

Figure 9U. *Amy* (2023) Acrylic on linen, 160 x 180 cm (5 parts)

Installation view at ‘Hopscotch: RCA Research Biennale’ (2023)
Copeland Gallery, London

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