

The Artist in the System: Reflections on computational painting and Systems Art

Laura Traver
Artist
Margate, UK
www.lauratraver.com
ltraver@hotmail.com

This paper examines the transition of my systems-based artistic practice from fine art drawing to computational painting over a fifteen-year period. I explore the development of my understanding of systems and trace the evolution of my concept of the role of the artist in systems from my early attempts to eliminate the artist, to my contemporary perspective in which the system allows for a reintroduction and renegotiation of the artist. The system is positioned as a framework through which artists may engage critically with technology by embodying themselves in elements, creating versions of their creativity facilitated by computational methods and artificial intelligence. I propose that the concept of elements is important because it allows for a deconstruction of the artist's experience and its reconstruction in computational painting. Finally, I present systems as a unifying medium which brings computational technology together with the fine arts and present my thoughts on the continued relevance of Systems Art to my practice and to artists working with technology, including artificial intelligence.

Systems Art. Computational Painting. Fine Art. Artificial intelligence.

1. INTRODUCTION

Systems Art has underpinned my artistic practice for over fifteen years. In this paper, I reflect on the evolution of my understanding of systems through the development of my creative practice from fine art drawing to computational painting. I trace the shift in my conception of the artist's role within systems, from my early attempts to reduce or erase artistic influence to my contemporary view that systems enable a renegotiation of creativity and the role of the artist. I present systems as being externalised creative frameworks through which artists can engage with technology. I explore the continued relevance of Systems Art methodologies to my own practice and consider the importance of Systems Art to contemporary artists working at the intersection of fine art painting and computation in what I term computational painting.

Computational painting unites fine art methods and 'plastic' mediums with computational approaches and concerns. The plastic arts is an infrequently used term that refers to art forms involving the physical manipulation of materials to create art, such

as painting or sculpture. This stands in contrast to computational mediums, which are generally virtual and non-physical. Computational painting requires a navigation and negotiation between the physical and non-physical. In my practice, computational painting frequently results in a physical painting in which AI and technological methods are an integral part of the process of creation, but not necessarily a visible part of the painting itself.

2. MY EARLY DRAWING PRACTICE

Initially, my drawings at art school in 2008 were intricate, patterned line drawings on white paper. Part-imagined and part based on the elegant forms of dried petals. The precision and detail required a significant amount of control as I drew directly on paper with pen. The breaths I took and even the thoughts I had showed up as wobbles in what might otherwise be a smooth line.

I became dissatisfied by drawing what I imagined and, at the same time, fascinated by the connection I observed between my body, my mind, and the line. I was inspired by Paul Klee and the beautiful

simplicity of the idea of a point turning into a “line on a walk” (Klee 1925, p. 16) and so I began exploring different ways to make and influence a line through a series of drawing exercises, initially exploring my breath and the line. From this enquiry into the simple black line, I began to expand and deepen my understanding of the act of drawing into different factors that created a particular line. From this, I developed a concept of the elements of drawing that I used in my practice to experimentally probe the definition and act of drawing. The mark, the gesture, the materials used, the dimension of the paper, and the intervals and duration of time all became part of my initial elements of drawing. These elements continuously evolved and were expanded upon and refined through drawing experiments.

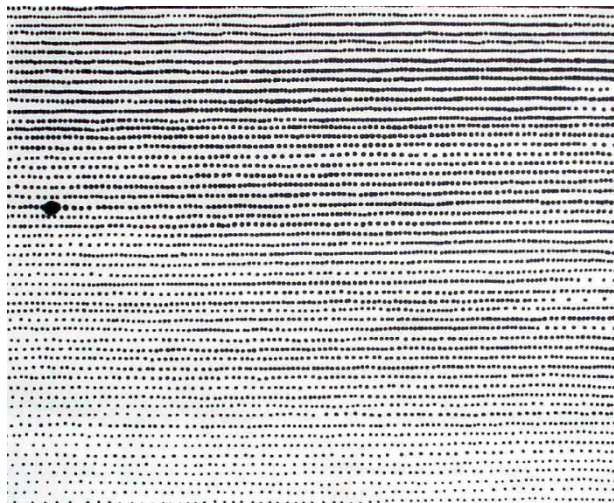


Figure 1: Section of *3 Minutes to Nothing*, 2009

At the same time as I was deconstructing drawing, I began to reconstruct the elements of drawing in different combinations that I initially thought of as recipes in experimental drawing exercises. In one piece I drew a row of dots across the paper allowing a decreasing increment of time to complete the marks for each row (Figure 1). In the first rows the marks are close together, and by the final rows the dots are further apart as I quickly made marks along the row within the shortened timeframe. The result is an unexpected pattern.

In another series of drawings in 2009, I repeated one single gesture starting left and moving to the right across the paper from a fixed position and repeating this from the top to the bottom of the paper. I captured the movement of my arm, the dimensions of my body, the drops of ink from my hand and the varieties of my touch. It appeared as though waterfalls of ink had come from the pre-designed process carried out by my touch, and I would never have created these drawings from my own imagination. I found that I often had an idea of how the final artwork might appear, but it usually ended up looking different to how I imagined it. It was

around this time that I was introduced to Systems Art and creating art through structured processes. I was fascinated by this method of art creation that was both experimental and investigative and resulted in a constant sense of discovery and newness.

3. SYSTEMS ART

My understanding of Systems Art is defined by the British Systems Group Systems Art of the 1970s. It is to the 1972-73 *Systems* exhibition catalogue that I have turned for this paper as containing a snapshot of a microcosm of Systems Art approaches at that time.

The recognition of the importance of systems in art, and Systems Art in particular, has suffered from too generalised a definition at times and from under recognised differences in American and British Systems in the early 1970s. I differentiate between Systems Art in the early 1970s and Systems Aesthetic, as described by the American art critic Jack Burnham in his 1968 article of the same title.

Modernist and Constructivist in origin, the Systems Artist worked on a human scale and, as a group, there tended to be a focus on the elements and syntax in art (Lynton 1973, p. 3). Systems Art can be defined as the composition of art made using rule-based process formulated before the act of creation to compose artworks from visual elements. There is a tendency towards order and construction rather than intuitive, aesthetic creation. Many of the Systems artists refer to restricting expression and subjectivity in their practice. The works are aesthetically minimalist, inexpressive and lacking in gesture.

Burnham tended towards a view of systems as larger structures and metaprogrammes which could be techno-social, economic, ecological or “any other matrixes of human activity” (Burnham 1968, p. 16, Burnham 1969). Artists and art itself were part of structures and matrixes (Burnham 1969, Burnham 1971) and the ideal systems artwork was formless, in a constant state of flux, and explored the important societal questions of the time (Burnham 1968). Systems Aesthetic called for a liquidation of the artist (Burnham 1968, p. 16), positioning the artist as a participant within a system that may dwarf them, and which they may represent or explore through art for the greater good of society.

The artist's role in the making of Systems Art is nuanced. Any subjectivity introduced by the artist is embedded within the system itself. Although not expressive, the systems produced by individual artists are unique constructions, even though the artist may be undertaking a discipline more like “Engineering, Architecture, Philosophy, or

Mathematics" (Jones 1973, pp. 26-27). Systems Art places an emphasis on elements and construction. This approach allows for a renegotiation of creativity through systems, which has been central to my Systems Art practice, and, more broadly, can contribute to a redefinition of the artist.

4. SYSTEMS ART IN MY DRAWING PRACTICE

My early efforts in Systems Art focused on restricting the creative freedom of the artist by constructing systems of drawing elements to further explore and engineer the sense of surprise and newness. Central to the reduction or restriction of the role of the artist in my practice at this time was serial repetition of an action or mark. This enabled an artwork to be made without aesthetically composing the elements of the artwork by making intuitive decisions about where the next mark should be placed during the creation of the work.

My physical body was used as a tool to carry out the system and it also formed a contributing separate human system composed of elements like my height, reach, fingers, arms, and the gestures that I could make. Generally, a system to make art consists of a beginning with an idea for a system, followed by the composition of the artwork according to that system, and concludes with the end of the system and the artwork. I considered that these were all points of artistic contact with the artwork through the medium of the system. My ultimate goal in my early practice was to eliminate the artist, or at least reduce my input as the artist to the beginning of the system, and thereby refine myself out of the process of creation as an intuitive and creative presence.

One of the key aspects of my practice is that my touch is often essential to carrying out the systems and I will frequently physically have my hands on the surface of the artwork while creating it. In my practice at this time, I considered that every time I touched the paper or interacted with the artwork was a point at which I might intuitively interfere with the work.

The importance of my physical presence to the creation of my work at this time contributed to the development of the concept of two types of systems in my practice in 2009 as I explored different ways to use elements and systems to minimise or eliminate the influence of the artist. I developed the idea of conceptual systems and physical systems. I had already been using conceptual systems, which brought together combinations of drawing elements in experimental process-based systems. Physical systems were formed of graphic elements painted on surfaces and these graphic elements directed my actions. Both types of system were designed to

minimise the intuitive compositional and aesthetic decisions I could make during the creation of an artwork, thereby reducing my artistic influence.



Figure 2: A series of systems ink drawings, 2009

As determined as I was to eliminate the artist as an intuitive presence, my artwork at this time started to become a conundrum because it appeared that the more that I tried to eliminate my artistic presence, the more I was present. In reducing my opportunity for creative or intuitive influence in the creation of each piece of art, I felt that I was discovering something. I was fascinated by the oppositional and dualistic quality of Systems Art - order and chaos, intention and randomness, structure and surprise. In between the elements of the systems, were mistakes, randomness, the unexpected, and chaos created by the interactions between visual components and conceptual elements in the system. If I had set out to compose the pieces intuitively, I would never have made them because I could never have imagined them. It was as though I was watching magic happen. Each piece I made felt special, like a surprise or discovery.

Systems Artists in particular make many references to order and also chaos. Peter Lowe wrote of the connection he observed between order and disorder, noting that the "existence of few factors allows few possibilities of order and less risk of disorder" (Lowe 1973, p. 34). Michael Kidner wrote that a "painter may think of himself as creating order, as discovering order, or as observing order" (Kidner 1973, p. 31). In my case, it appeared as though I was creating, discovering and observing disorder with my presence. My view has long been that this disorder or chaos revolves around creativity and intuition.

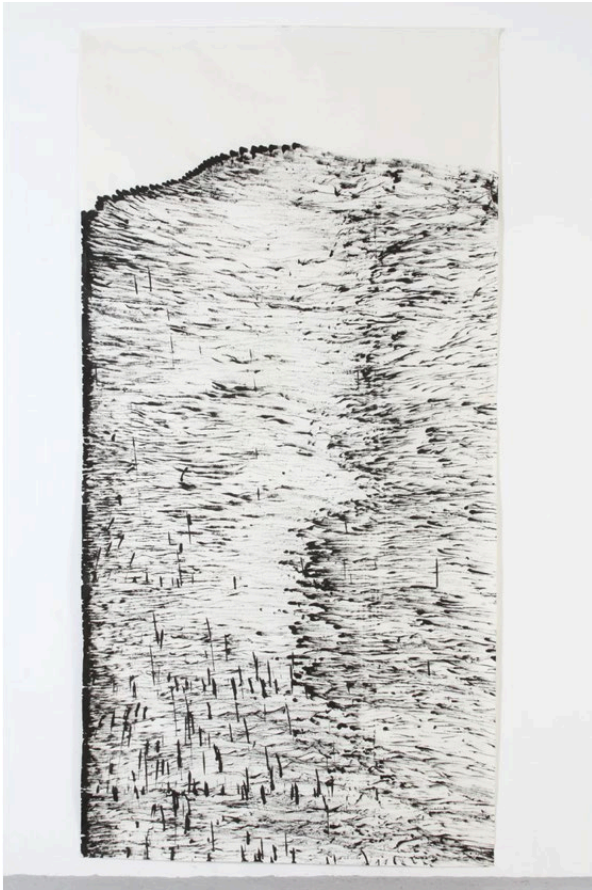


Figure 3: *Systems ink drawing, 2009*

4.1 DrawBots

By 2017 I had become disillusioned and somewhat lost in the conundrum that was the pursuit of the elimination of the artist. Looking for something to reenergise my practice, I came across computational art and quit my job the next week to study it at university. Still driven to eliminate the artist, I created *DrawBots* in 2018 with the ambition that I could make art without the artist by embodying the system in a swarm of drawing robots. The elements of the system were symbolically and physically embodied in three drawing and painting robots that interacted with each other and communicated over WiFi. The robots made simple marks on paper in response to the presence of the other *DrawBots*. It was part experiment and part art, and I hoped that by totally removing my physical touch and as much of my interaction as possible from the process of making the art, that the art system could exist without me.

The work proved to be a pivotal point in my practice and understanding of Systems Art. By creating an autonomous physical system composed of three symbolic elements in the form of three drawing robots, I disembodied myself from the system and removed myself as the artist from being the engine of my systems by removing my touch. This allowed

me to more clearly understand systems in my art practice and my own interaction with systems. Conceptually, because the system was physically separated from me, the autonomous system served to emphasise how and where I interacted with the system. Even an apparently autonomous system would require a slew of initial decisions and my artistic and technical experience to create. I concluded that I am fundamentally intertwined with the systems I create and the art I create with them, and that they are as unique and personal to me as a creative fingerprint or a painting.

Externalising the system that made the art also demonstrated my own non-compliance with the system that I had created. I named the robots, personified them, tended to them, I changed their paint or drawing utensils, experimented with the paintbrushes and interfered with them. I finally accepted that it was impossible to make art entirely without the artist – the form, the style, the intent, the idea, and the experience that makes the system that makes the art are all unique to the artist.

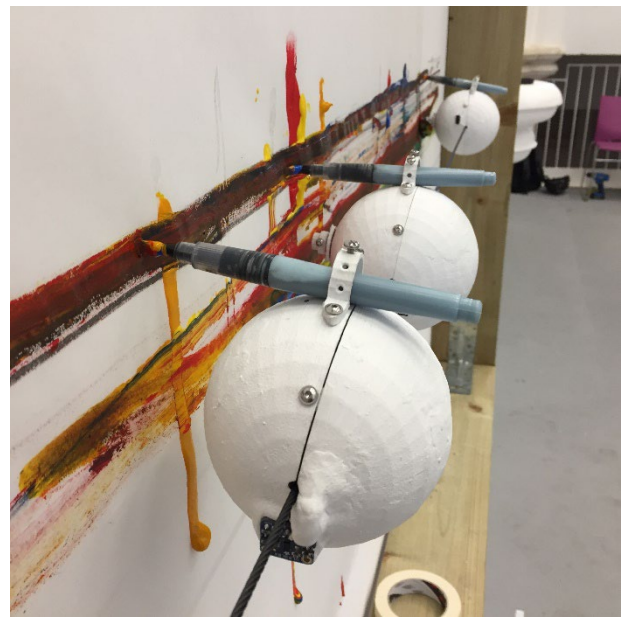


Figure 4: *DrawBots, 2018*

This experience also led me to recognise that in my practice I fractured the concept of the artist into two elements both of which could be involved in the creative system. The system can embody a concept of the intuitive artist and the physical artist. The physical artist can carry out the system that composes the works, while the role of artistic intuition operates on a continuum and may be introduced at set points by the artist. I used the elements of my body as the tools to carry out the rules of the system, in the same way that I use a computer. In this way, the drawings that I was making ten years before *DrawBots* were algorithmic art and the paintings I was making with computing

were fine art and the elimination of the artist was a very useful creative game.

I realised that in my drawing practice, I embodied my system in order to carry it out and effectively replaced myself as the artist with the system as myself. Instead of programming a computer, I programmed myself to carry out my systems in a repetitive, gestural Systems Art in which I was both central to the creation of the artwork and replaced by the system.

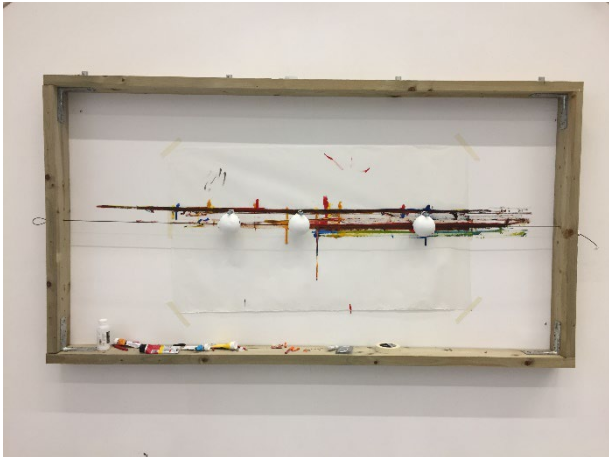


Figure 5: *DrawBots*, 2018

Rather than eliminating my intuitive and creative presence as the artist, the system highlights my presence and importance. Systems can be more than a conceptual structure of elements interacting with each other, systems present a method to strip creativity down to simple, elemental decisions and concentrate artistic presence. In this way, a system can fundamentally be regarded as a construction of choices which forms a channel for artistic decisions and the decisions themselves are elements of the system. This has distinctive implications for artists working with artificial intelligence in a world with increasingly sophisticated machinery and where art can be consumed as content.

4.2 Systematic Spontaneity

DrawBots led me directly to my work on the ongoing computational wall painting series *Systematic Spontaneity*. In the painting series I work interactively with the system, which consists of previous choices I have made during the painting as elements of the system. I allow my intuitive decisions into the system for the first time, and the system surrounds me; I am part of it.

The development of this painting system began in 2018 with a series of simple drawing exercises with a computer. In the first exercise, I followed projections of moving shapes and made marks on paper in response to the forms. In another short series of drawings, I drew on pre-printed drawings to

explore the differences between my hand and the computational 'hand'. Through these exercises I learned that computational painting would require me to work closely and creatively with technology in a way that I had never done before. I felt as though I was bringing pairs of opposites together: physical and nonphysical, living and computational, and projected bright light and my shadowy hand. The concern was less how the painting system would function, and more whether I felt comfortable enough with the working process to be creative. From these experiments, I began to develop my process of live painting using a projector.

In 2019, I created the first iteration of the painting series *Systematic Spontaneity*. The computational system embodies my decisions and will suggest a mark, analyse the next mark I make in response to this, and then feeds a next predicted mark back to me based on the creative choices I have made previously in relation to the prior suggestions. The computer and the next suggested marks of the system are represented by the black circles on the wall and my human interaction with the technological and conceptual system is represented by the paint throws. It is a generative chain reaction in which my physicality, presence, and the choices I make as the artist are central to the system and the painting.

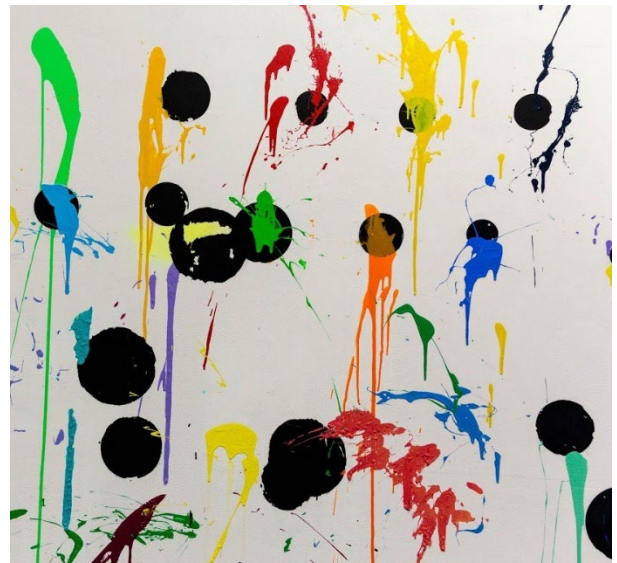


Figure 6: A section of *Systematic Spontaneity*, 2019

Rather than trying to eliminate my artistic presence, the painting series makes my points of interaction with the system integral to its creation. Each point of interaction represents a point of intuitive choice and physical artistic presence. I can be compliant or disruptive of my system. I do not have to choose to follow the rules of the system, however that choice will then be incorporated in the system, and the system does not know what I will choose to do next. It is Systems Art in which the physical human, artistic intuition, and computational systems come together.

In recent years, AI has been brought into the process in the analysis and prediction of my creative choices. The system, through AI, becomes a mirror of myself which, by treating intuitive choices like elements, feeds my creative autonomy back to me in a way that I can choose to disrupt or comply with. By using AI, the system becomes more interactive and exists as a snapshot of me as the artist at the time I made the work. This serves to further distance the system from myself and enables the computational system to become an embodiment of my choices and even myself as the artist.

The artist Harold Cohen called his AI computer programme, AARON, his “other half” and “other self” (Cohen 2011, quoted in Sundararajan 2020, p. 1) which demonstrates the potential of AI to facilitate artistic expression and replicate or even duplicate the artist, or a version of the artist. My use of AI in the system is not with the intention of creating a parallel artist, “other self”, or creative partner; rather, it reflects me at the time I made that painting. My intuition, as expressed by choices, becomes data in paint form which in turn become elements of my system. The AI is small scale, representing parts of myself and the imprint of my choices in the computational system. The system used in this way highlights my presence and directs my intuition and my creativity.

A system in art can be regarded as an elemental system of visual and data components, but it holds the potential to be much more widely applied when it is treated as an externalised creative conceptual structure through which artistic processes can be formalised and processed. When regarded in this way, it becomes an adaptable framework for artists, particularly those working between the plastic fine arts and computing, to begin to connect with technology and AI in a physical way.

The concept of elements is central to this framework because it provides a conceptual basis to connect the physical human with the non-physical computational system. It supports a deconstruction of the artist's own personal experience of the world and technology, and it enables the artist to reconstitute the elements in a system of their own making. This enables fine artists thinking about exploring computational methods, as well as artists already working in computing, to approach computational technology and AI on a personal, human level rather than being subsumed into a wider technological system. In this way, Systems Art continues to be relevant as a creative framework for an artist to be present with technology and approach it in a way which the artist is in control rather than the technology, and in a way, which is meaningful to their practice.

5. LIQUIDATE THE ARTIST

The artist occupies a complex place in the making of Systems Art. The artist's capacity to make spontaneous, intuitive, subjective decisions is limited by the system, however, this limitation also presents a distillation of what the artist is. This is particularly relevant at a time of potential anxiety among artists about the increasingly widespread use of AI to create images and art.

The idea of the artist dematerialised in the 1960s and shape shifted into engineers, architects, and computer programmers. Systems Aesthetic encouraged artists towards “liquidating his position as artist vis-à-vis society” (Burnham 1968, p. 16). It was in this period that the individual creative act became less important than the investigation and development of communication systems and visual codes, according to the art critic Boris Groys (Groys 2005, p. 142). The idea of the artist has not recovered from this liquidation. Contemporary concern among creatives in relation to competitive AI image generation, or even future artificial creativity, has roots in the liquidation of the artist in the mid-twentieth century.

Systems Art demonstrates that the creative act does not have to be expressive or incorporate spontaneous intuitive decisions. In fact, as I have discovered over the course of my own artistic practice, the emphasis on elements and construction in Systems Art leaves room for a renegotiation of creativity through systems. When systems are regarded as externalised creative frameworks, the artist can use the system to externalise themselves in elements, create versions of their creativity, and allow the artist and expression to be brought back in and combined together with the technological system. In this way, the system can also be expressive and, rather than limiting the intuitive artist, can facilitate intuitive artistic expression. The system no longer presents a network of chosen limitations on the artist, systems enable the artist to choose where, when and how to be physically, conceptually or expressively present. Systems Art therefore has the potential to re-materialise the dematerialised artist.

Systems enable the artist to examine themselves as the artist, and explore the intangible qualities of creativity, intuition and expression on a personal scale through the reconstruction of elements within the system. Systems Art has allowed me to break my creativity down into choices and interactions, because the computational process preserves my creative choices. This, in turn, enables aspects of my creative self, including my intuition, to be fed back to me as a reflexive, embodied thought process through AI. The process creates a reflection of my artistic self during the creation of that piece of work,

with the system acting as a mirror to explore myself. The process could also be regarded as creating a painting without physical form, if a painting is treated as being a representation of the artist at the time they made the artwork.

Systems Art was formed in a time of far-reaching change in technology. When Burnham encouraged the artist to liquidate to better focus on the big issues of the time, it was in this revolutionary context. However, I also have a sense that Burnham did not particularly value artists and wanted to expose the “hoax of treating artists as social beautifiers” (Burnham 1969). We are at another significant technological turning point with the rapid expansion in the use of AI across the globe. The most important issues of our time include what it means to be human. Now is the right moment to revisit Systems Art and the liquidation of the artist to explore and reflect on the qualities that define us.

6. UNIFYING SYSTEMS

A characteristic of Systems Art which fascinated me from the earliest days of my practice is that it is an art of opposites and dualisms, created or highlighted by the system. References to dualisms are made in several of the artist statements in the *Systems* catalogue, including Malcolm Hughes who categorised his systems thoughts under the headings “conceptual/intuitive”, “physical/objective”, and “perceptual/psychological” (Hughes 1973, p. 22). This quality of Systems Art represents the strength of systems: all systems are unifying. Systems bring parts together - whether these parts are ideas, places, people, objects, or any other matter. This includes artists and technology, and plastic arts and computing.

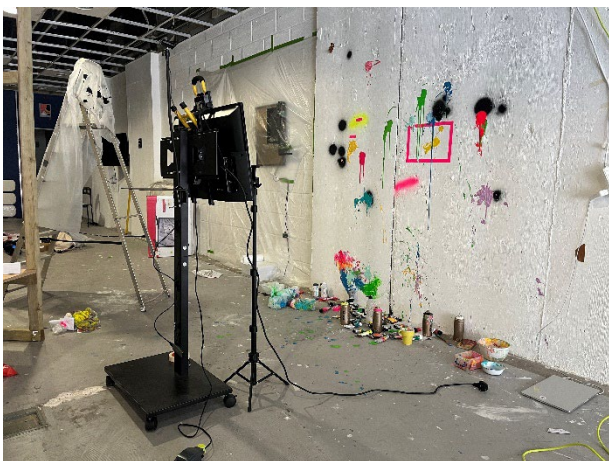


Figure 1: *Systematic Spontaneity in progress, 2022*

When developing the computational painting process for *Systematic Spontaneity*, I learned that a computer shares nothing in common with me, except what I project into it. Fracturing the artist into

elements, including the choices of the intuitive artist and the actions of the physical artist, has enabled me to project myself into the computer and create commonality and a working relationship with the technology. By creating reflections of myself as the artist by combining computational methods with the system, I have been able to bring me, as the artist, closer to the technology.

The process of deconstruction and reconstruction in Systems Art has the potential to provide unifying cohesion and meeting points for the elements of the system. Computational painting requires a common surface on which to work with the computer, where the opposite substances of the artist and the computer can align. In my practice, the canvas or wall forms the surface on which I meet the programme. The camera recording my choices is another surface, and so are the screens I look at. To work intuitively and spontaneously with technology in computational painting, where and how the artist and the programme meet are essential considerations which enable the artist to create their own space between the plastic and computational arts. This is because computational painting involves a relational and introspective engagement with technology that is quite different to traditional fine art practice. Systems Art provides a methodological framework to approach this challenge and supports artists developing working relationships with the technology that they are using.

7. CONCLUSION

Systems Art is an art of “the order that lies between imagination and reality”, as Michael Kidner wrote in the *Systems* catalogue (Kidner 1973, p. 30). It is an art of dualisms, capable of uniting seemingly opposed parts and concepts such as intuition and logic, creativity and cognition, and the physical and the intangible. Systems can support computational painters and artists working at the intersection of the plastic arts and computing in navigating the space between the digital and the physical.

The importance of Systems Art, and the recognition of the significance of systems in art in general, has largely been overlooked outside of computational art and computer art. Burnham's view that the system was the pre-eminent art form of the twentieth century has been overshadowed by Greenbergian definitions of twentieth century art (Burnham, Jones in Shanken 2015). In the twenty-first century, the ongoing computational revolution has made complex technology easily accessible for artists. The artist no longer needs to be the engineer, the scientist or the architect, and nor does the artist need a degree in computer science to use the technology.

Systems Art and the concept of elements provide a conceptual foundation for the artist to abstract their experience of art, technology and the world into elements and reconstruct these within a system. This can enable a renegotiation of artistic creativity through the system which is facilitated by the use of computational technology. The artist can choose how to be present in the making of their work by using systems as the medium to connect with technology. The artist can also use the system to explore their intuition and expression when the system is understood as an externalised creative framework which enables a reflexive thought process. The system can then become a mirror for the artist to explore their presence and the order (or chaos) that lies between imagination and reality, intuition and the system, and the artist and the machine.

8. REFERENCES

- Burnham, J. (1974) Real Time Systems. In Burnham, J., *Great Western Saltworks: Essays on the Meaning of Post-Formalist Art*. George Braziller, Inc., New York. (original work published 1968).
- Burnham, J. (1974) Systems Aesthetics. In Burnham, J., *Great Western Saltworks: Essays on the Meaning of Post-Formalist Art*. George Braziller, Inc., New York. (original work published 1968).
- Burnham, J. (1971) *The Structure of Art*. George Braziller, Inc., New York.
- Groys, B. (2015) The Mimesis of Thinking. In Shanken, E. A. (ed.), *Systems*. The MIT Press, Cambridge, MA. (original work published 2005).
- Hughes, M. (1973) Malcolm Hughes. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Jones, C. (1973) Colin Jones. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Jones, C. (2015) Systems Symptoms: Jack Burnham 'Systems Aesthetics'. In Shanken, E. A. (ed.), *Systems*. The MIT Press, Cambridge, MA. (original work published 2011).
- Kidner, M. (1973) Michael Kidner. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Klee, P. (1972) *Pedagogical Sketchbook*. 7th edn. Frederick A. Praeger, Inc., New York. (original work published 1925).
- Lowe, P. (1973) Peter Lowe. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Lynton, N. (1973) Foreword. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Steele, J. (1973) Jeffrey Steele. In *Systems 1972-73*. 2nd edn. Arts Council, London.
- Sundararajan, L. (2020) Harold Cohen and AARON: Collaborations in the last six years (2010-2016) of a Creative Life. *Leonardo*, 54(4):1-10.