A STUDY IN ENTROPY

Research into the Potentials for Digital Abstraction
by the Replication and Decomposition of Information

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Research Questions:

What are the visual potentials of creating entropy by extracting and recycling the information held within images as a tool for abstraction?

What are the metaphorical outcomes and theoretical questions that this process creates?
Abstract

This research examines how the information that accumulatively forms the image can be extracted, disseminated and recycled to be recomposed into new abstract forms. It further observes how the organic nature of the process of constraints and deviations is reflected in these new forms, and in the creation of spatial environments and maps of narrative experience.

Using digital printing on transparent acrylic sheeting and other materials, the components of the image are abstracted using digital replication. Systemic processes and formulas direct the flow of a path that exposes the image’s information. Manifestation by printing on layered transparencies forms the structure of visual analogies of entropic systems.

At its core this research is concerned with the basic source and to extrapolate from that, in a way that reflects entropy and movement. I have utilised the capabilities of digital reproduction to replicate information on a pixel-level. These pixels then gain metaphorical ‘agency’ as they are copied and replicated, theoretically ad infinitum, producing intricate outcomes from slight variable deviations. In practical terms, the method that I used expresses a complex visual structure from simple replication and deviation.

The writings of Erwin Panofsky and Henri Lefebvre informed the relationship that has developed between the method of abstraction and the formation of ‘space’. The spatial qualities inherent in the abstract forms allude to a meta-narrative of collective interaction.

The implication of this shows that systems of variable deviation have a natural tendency to depict a space that has a metaphorical resonance. Potentially, a map of universal movement, such as the habitus, itself a representation of social interaction and causal influence.

Ultimately, it has been the manifestation of these visual processes into an object within the space of the gallery that has raised important questions demanding answers. The necessity of choice becomes significant, as the need to finish the process negates the implication of perpetuity.

From the image we can draw out this information, and from this information we can abstract it, take it on a path and observe how it reacts with systems and deviations. In doing so there is a visualisation of abstract forces creating figurative environments and observable spaces. These structures, where the components coalesce and deviate, provide, for me, a way to express an internal understanding of experience and existence.
Declaration

This is to certify that

(i) the thesis comprises only my original work towards the masters except where indicated in the Preface*,

(ii) due acknowledgement has been made in the text to all other material used,

(iii) the thesis is 12,166 words in length, exclusive of tables, maps, bibliographies and appendices

James Langer
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Introduction

What information looks like, what we make of it and how it manifests, are the central inquiries of this research. An image is loaded with information, often invisible, or hidden in the mass of the whole. From the image we can draw out this information, and from this information we can abstract it, take it on a path and observe how it reacts with systems and deviations. In doing so, there is a visualisation of abstract forces creating figurative environments, observable spaces. These maps of experience, thought and society are deeply rooted in abstract notions of entropy and interaction, a navigation of images and moments.

This research began as exploration into how the components and information that collectively form an image might be used to create abstract composition. I have applied a method of digital abstraction whereby the components of an image – the representation of all that hidden data – are replicated digitally. This action pulls the pixels from one point to the next, adapting to variables created by a simple formula that begins a predetermined path for these pixels. This continuum represents the unpacked information, reused and distributed. The incidental way that the source of this information is applied, the incidental path of the pixels, and the incidental outcomes, reinforce how reality is understood: the constant flow, confluence and recirculation of the same basic components, re-manifesting themselves.

It is an act of navigation, and of decomposition/recomposition of the image. Navigating the separate colour components of these images provides an analytical approach to discussions about image components and substructures of image and form. Beginning with the technological ability to reproduce the most basic components of reproducible forms – the pixel.

As a necessary aspect of the research, I probed the potentials of digital printmaking as a technological achievement, and a natural successor to the commercial means or reproduction that have allowed artistic printmaking to continually evolve. I did this through a manual-generative method whereby I destorted and regenerated the pixels and visual components of digital image with software, and then to print onto an array of surfaces including transparent acrylics and vinyl. This method has its roots in theories of reproduction, technology and image proliferation, which are an inevitable outcome of contemporary printmaking’s momentum.
The first chapter of this exegesis places the body of work into context, showing a link between the digital method and the natural outcome of using replications within formulas and systems. The product is an abstract composition that achieves two things: to disrupt the visual components of an image into a formulated pattern, different but intrinsically linked to the properties of the source, and to become a metaphorical reflection of thought spaces - layered maps of interaction and experience.

In chapters 2-4 I discuss how the method evolves from several artistic influences. An example of this is Julie Mehretu’s abstractions, created through layers of visual data such as architecture and her belief in the potential ‘agency’ of the mark. This influence sits alongside the work of Gerhard Richter and his use of pixels, sampled from images of his own paintings. These artists have influenced how I approached digital and layered abstraction, and the manipulation of pixels.

As the works began to take the form of systemic spaces, Matthew Ritchie’s paintings and sculpture – and informative public lectures – as well as the writings of Erwin Panofsky and Henri Lefebvre, informed the relationship that was developing between the method of abstraction I had created and the formation of ‘space’. The ultimate implication of this has been a conceptual discovery that systems of variable deviation have a natural tendency to depict a space that has a metaphorical resonance to time, causality and narrative. Potentially, a map of universal movement, such as the rhizome or the Lorenze attractor, and most significantly, habitus, itself a representation of social interaction and causal influence. This is best exemplified by artists such as Jessica Rankin and Lee Manovich, who each draw connections between the act of mapping and interaction.

Upon printing onto a physical surface, the addition of layering and transparency further informs the unpredictable nature of the outcomes. Ultimately, it has been the manifestation of these visual processes into an object within the space of the gallery that has raised important questions demanding answers. The necessity of choice becomes significant, when in the beginning of the research it was intentionally ignored. The need to finish the process, and have a quantifiable product of a method of image-making, negates the original implication of perpetual progression. My response to this question is to show the futility of both choice and relinquishing it completely. To shift the perspective away from action toward substantiation of the information itself. What remains is the importance of that source information found in the images. That information has so far been carried on in every manifestation of the process,
never added to, until it’s final distillation into simple patterns. The information therefore, has been taken on a journey, from one form, the digital photographic image, to an abstract conclusion.
Chapter 1 – A Progression of Different Differences: Theoretical Context.

1.1 Presupposing a Method. The Printmaker’s Instinct

This body of work, as research into visual potentials, relies on a presupposition from the outset: I have utilised printmaking tools due to my background and interest in these methods, however, am not attempting to distinguish the project as that of a printmaker. To call it such would simply not do justice to the complex and evolving ideas of modern print-media theory. I made use of certain contemporary print-making techniques, commercial materials and digital software to create physical works. As such, these are a manifestation of digital methods distinct from printmaking as a holistic goal. Many decisions in the course of this research, by necessity, have involved modes of production that are outside the theoretical discussion of printmaking and reproduction. Therefore, it’s important to maintain a distinction between the nature of something that is produced digitally, and something that is reproduced digitally.

However, due to the inextricable link between print-media and the modern produced image\(^1\), the practical parts of this project that involve methods of mechanical (including digital) print reproduction, not just the theoretical, must be discussed, as they will interact with each other over the course of this research.

The position of contemporary printmaking is a complicated one. The nature of printmaking relies on the reappropriation of certain means of mass reproduction that otherwise serve a commercial function. It is because the logical course for the nature of reproduction itself lies in the overwhelming expanse of the digital matrix\(^2\). And so the future of the artist printmaker becomes inextricably bound to the structure of the contemporary world: digital software is not only the dominant means of reproduction, but the means of production as well, and is directly linked to the means of information dissemination. We are living in the Digital Age. This gives the printmaker an advantage, in that the means of reproduction has become so intertwined with direct communication and interaction between individuals. The potential for

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\(^1\) The idea of the image, and the modern production and reproduction of it are all tools and ideas that have a practical utility in my work, but also form the basis of the source of the methods I will be discussing. When mentioning the ‘image’ I will often be evoking its modern importance as a reproducible form of information.

\(^2\) All further use of the term ‘matrix’, including digital, direct, transferred or electromechanical, refers to the use as involved in printmaking.
the printmaker to use their instinct for the index and the reproducible lends itself to contemporary artmaking, when the arguments about art in an age of mechanical reproduction are diminishing, and technology has provided tools which expand the scope of printmaking. This goes so far as to include the reproduction of every element of a digital image, down to its composite colour layers and its pixels. This elemental reproduction is where my project began.

A possible insecurity for the artist as printmaker is the disappearance of the medium altogether, into what is fast becoming a blend of mechanisation, the unphysical and social theory. But the ‘image’ is more loaded than ever. As digital theorist Timothy Druckrey foresaw in the 1990s³, ‘images have never contained the potential to sustain so much information, or, perhaps, meaning.’⁴ My strategy therefore was to embrace this and expand upon the metaphorical resonance that seemed to surface at every application of digital reproduction. The emphasis on the information found within the digital image and the components of its make-up were subject to decomposition and dissemination via reproduction. This act of decomposition was my departure point from discussions about printing methods, taking the work toward theoretical outcomes and implications, such as depictions of causal movement, confluences and thought-spaces.

1.2 The Image. The Data

This method involving information reproduction will see the work transform from the digital image into an abstract state and ultimately operate as a bridge between abstraction and the application of the method to print. There seemed to be constant parallels with knowledge theory and as Timothy Druckrey noted, ‘The discourse between images and knowledge, between cognition and epistemology, is being narrowed within the development of digital technology.’⁵ He argues that images have been linked to the ‘social logic of enlightenment ideology’. As an outcome this serves as an interesting arrival point from what are essentially two departure points at the start of my research: my background as a printmaker and a

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³ The author chooses to write under another presupposition that, in terms of digital art theory, ‘early’ is a relative term, and that the 1990s can be regarded as ‘early in the story.’
⁵ Druckrey, T. Iterations.
conceptual interest in cognitive mapping. Both the mechanical productiveness and the concepts of personal experience can be implicated together in the process of digital image making. Druckrey discusses the connection in terms of instantaneity.

Layered in the imagery of the electronic montage is a possibility to merge memory and temporality. What particularly hindered traditional photography was the limitation of instantaneity. If time and narrative are connected, the breadth of issues can be refurged.

I approached image dissemination and the reproducible image as the form of the information and data we share and copy and present. The accumulation of ‘data’, like collage, provided the visual framework for the work. Initial attempts at this were in ink drawings, creating ways to expand the individual marks that made up the many parts of the data collected:

Once the focus turned to digital methods the implication of a more varied and layered information structure to the image began to define the outcome of the process. Elements of information that are invisible to the artist become successively more visible and more dominant as the information is extrapolated. Tones and colours that make up a minute aspect of an image are emboldened; the code that binds the digital image maintains an algorithmic

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6 Aspects of psychogeography, such as work by Guy Debord and the Situationists International are (footnote, eg psychogeography etc).
8 Once again, this started for practical purposes, as it made sense to explore photographed as well as drawn pieces of data.
presence, holds onto every detail, even under the most extravagant warping. As a tool for the modern proliferation of information, i.e. digital reproduction, this method now directly reflects the accumulative efficiency and potency of modern mechanical reproduction.9

Walter Benjamin’s *The Work of Art in the Age of Mechanical Reproduction* was appropriate in analysing the implications of mechanical reproduction. Several theorists have built upon and contemporised Benjamin’s theories for the digital age, including Douglas Davis’s 1991 essay *The Work of Art in the Age of Digital Reproduction*. He argues that the digital medium offers reproduction without degradation and therefore further breaks down, and ultimately must redefine, the conditions set by Benjamin between the original and the copy. Without a ‘unique existence at the place where it happens to be’10, as perhaps in a time and space for an original to ‘exist’, then the *aura* loses significance.

Davis sought to classify the merger of the ‘original’ with the copy into a new relationship between author and viewer. ‘Digitalization transfers this aura to the individuated copy. Artist and viewer perform together. The dead replica and the living, authentic original are merging, like lovers entwined in mutual ecstasy’11.

Considering that Davis was written nearly twenty-five years ago, I sought to build on his logic and delve into the act of digital reproduction and what the basic application of the technology can do in terms of the variety of ways replication and reproduction can happen. Digital mass reproduction of content is not my primary concern (that would indeed be print-media

9 It might seem that the mechanical nature of digital production, including reversibility, instantaneousness and replicability, puts this method somewhat self-consciously in a position of separateness from traditional modes of abstract art-making. But digital production is no more a symptom of modern mechanical excess than any previous progress in art-making, art reproduction or information dispersion: from printing presses, lithographs, or the very invention of writing down information. For that matter, any progressive act of ‘making’ by humanity since its beginning. Plato warned in Phaedrus that writing was merely a simulation of knowledge, and not the pure remembrance of it. It was argued that ‘reading made one passive, hindered one’s own experiences.’ (Rotzer, F. (1993). *Images Within Images, or, From the Image to the Virtual World. Iterations: the New Image. 61-82.*) The digital reproduction and production of art seems a natural progress, and while criticisms of it as invalid are natural and inevitable, the printmaker stands to benefit from this newest progress in making, as the line blurs between what is reproducible and what is even original.


research). My concern therefore was what inhabited the creative act after this reproduction. My concern was the cycle\(^{12}\) of the process of mass digital production back into a fluid mark-making and abstract visualisation. This project pushed the potential of ‘replication’ down to the most minute of components: replication of pixels and sequences of pixels and layers, so as to create a visual experience that expands on the ‘lovers entwined’. While the project would be finalised in a physical space, the culmination of the composition happened in that digital matrix.

Once in a physical space, a new set of challenges emerged. UK artist Marilene Oliver shows the tensions and complications of the physical manifestation of the digital matrix. Oliver collected mapping data that became the object only as the data was layered as part of a larger image, layering that creates a three-dimensional object acting as a map of the self.

\(\text{\textit{Figure 2. Marilene Oliver, Heart Axis, UV cured inkjet and optichromic and interference ink (silk screened) on to polycarbonate, acrylic stand. 162cm x 117cm x 75cm 2007.}}\)

\(^{12}\) ‘Revolution’ in terms of something coming full-circle, rather than a socio-political change.
As all forms of print reproduction involved creating a basic component by which to make a schematic of an image (pixels), Benjamin had to be further reassessed in order to adjust for the ability of digital reproduction to be infinitesimal. Digital image-making requires a reproductive tool, a basic component, in order to image-make, and yet the ‘original’, the ‘aura’ and the ‘uniqueness of the work’, are not either, or possibly are both. At no point in the process is the product, as it exists in the digital matrix, physical. It is able to be reproduced en masse, and the pixel acts as a dot-matrix might, but further, because the pixel is in a constant state of potential flux and manipulation, whereas the dot is not. Uniqueness is not destroyed, so much as the ‘aura’ is reinterpreted, to allow for a state where the work. Davis predicted this when he wrote that there is no longer a ‘clear conceptual distinction between original and reproduction in virtually any medium.’

Digital artist Paul Thompson’s doctoral research approaches digital printmaking in reference to the digital matrix, as the final form of the work, existing in a non-physical space. I have already stated my intention to print works into the physical space, utilising electromechanical matrix to produce prints. While this is where I deviated from potential print theory, the digital matrix, in regard to the process of image making itself, relies heavily on the ability of a digital matrix to reproduce the components necessary for my method.

In the post-physical practice of Printmaking 2.0 (digital matrix) works remain fluid in the digital content of the matrix and have the potential to be updated and re-worked … [It] is fluid and reflects a relativistic temporal model, where the print remains unfixed and capable of ‘instancing’ beyond the hand and even the lifespan of the original artist.

As became apparent as the research continued, this fluidity and unlimited ‘instancing’ takes on a metaphorical resonance, touching on socio-logical systems.

Each instantiation is a unique edition from a digital matrix, collaboratively ‘printed’ either physically or virtually with the participant … This digitally authorised impression shifts the artist/audience relationship toward socially networked flux, more rhizomatous than simply push/pull distribution.

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15 Thompson, P., 216.
Thompson is describing a theoretical possibility where the method can be passed on to another participant to adjust or perpetuate. That changes the nature of the art, as the ability to copy allows the continued production of the original, theoretically ad infinitum.

I am not making a point about the validity of digital art, and I don’t refute Benjamin. I am reflecting on the importance of the components that are the conceptual starting point and investigatory experimentation of my research. These components are the pixels, dot-matrix, pen marks, colour layers and code that are the reproduced image’s elemental structure. Because of these, it is important to understand the distinction between Benjamin’s ‘original’ work and its ‘aura’, and why that is insufficient in this discussion. ‘There is no such thing as a copy. In the world of digitised images, we are dealing only with originals.’

16 I agree with Groys, insofar as Benjamin’s theory stops applying at the point where the artist and the audience has the ability to reproduce any pixel in any part of the image and warp it, collage it and replicate it, instantly, and so create a new work with each action. This act skirts the grey area between original and reproduction, and begs the question of whether the final artwork is unique or not.

1.3 Maps. Space

The means of replicating pixels in a linear trajectory, manually creating a pixel ‘bleed’, is reflective of spreading paint, in the manner of Gerhard Richter.

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Rather than the physical paint inevitably ending, the pixel is subject to infinite reproduction of its complete self and every component from there backwards to the pixel, as far as the creator’s wish to labour. This manifests itself most clearly in generative methods, which became an integral part of this strategy.

…the term generative art covers art practices where the artist creates a process that acts with some degree of autonomy to create all or part of an artwork. One of the motivations for such a practice is a hope that something unforeseen will happen, that more will come out of a system than was put in, that emergence will occur.17

Generative practices, though varied, tend to serve a shared understanding that ‘surprise is a necessary but not sufficient condition for emergence…But even when the behaviour is no longer new to us, it should still generate a sense of mystery or wonder.’18

The ‘emergence’ in the context of my work, much like modern image proliferation, is a representation of exponentiality inherent in the natural movement of experience and existence, in a pattern that is neither linear nor fixed. It gets close to Deleuze’s rhizome19, where data and the interpretation of information allows for non-hierachical, multiple points of entry, working against dualist, binary representations of information, a state of representation this

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18 Monro, G. Emergence and Generative Art.
is more like the roots of a rhizome than a tree. Indeed, Deleuze’s method is as applicable to social theory as it is to epistemology. In the case of my research, however, I resist completely ignoring the source (or beginnings) that forms the core of my data. The outcomes are rhizomic in terms of being maps of reproduction, and the history of information and experience, but the outcomes more closely resemble a navigation of a multitude of courses and deviations.

These ‘unphysical’ and metaphorical representations of social theories responds to Erwin Panofsky’s assertions that the modern era is characterized by its ‘peculiarly mathematical expression of the concept of the infinite, within a space that is necessarily both continuous and homogeneous.’ The creation of an abstract perspective, manifested in digital and generative systems, echoes the meta-narrative that is usurping the perspective of the individual and conveying a perspective of collective experience.

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1.4 Influences. Agency.

US artist Julie Mehretu’s combinations of architectural perspective and abstract mark-making serve as an anchor point for my ongoing creation of a visual language.

As the work developed, the language of mapmaking, specific architectural plans, and then eventually the symbolic of visual traditions in art history slipped into the layers of the paintings. Different types of visual language symbolised and referenced various social and political ideas and attitudes. They began to participate with the characters in the construction of the narrative. They acted as a metaphoric bridge from the abstracted ‘no-place’ of the earlier paintings…\[21\]

Mehretu’s development of a meta-narrative combines moments of the figurative and the abstract, and serves as an example of the decomposition of imagery.

Figure 3. Stadia I, ink and acrylic on canvas and Stadia II, 272 x 356 cm, 2004.

Mehretu’s work often feels like a production of both space and time all at once and reflects Doreen Massey’s writing on space, time and history in *Politics and Space/Time*, in that these elements come together in ‘4-D’.

One way of thinking about all this is to say that the spatial is integral to the production of history, and thus to the possibility of politics, just as the temporal is to geography. Another way is to insist on the inseparability of time and space, on their joint constitution through the interrelations between phenomena.\[22\]

That four-dimensional expression of space, time, interaction and memory is what I have begun to see as the metaphoric outcome of my initial digital process.

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For precisely that element of the chaotic, or dislocated, which is intrinsic to the spatial had effects on the social phenomena that constitute it. Spatial form as ‘outcome’ (the happenstance juxtapositions and so forth) has emergent powers which can have effects on subsequent events.\textsuperscript{23}

Panosky observes a progression of perspective in art that links cognitive, visual, cultural and social expression.

Perspective transforms psychophysical space into mathematical space. It negates the differences between front and back, between right and left, between bodies and intervening space (‘empty space’), so that the sum of all parts of space and all its contents are absorbed into a single ‘quantum continuum’.\textsuperscript{24}


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The goal of generative production is a continuum, and that perspectival continuum begins to look a lot like \textit{habitus}, a sociological concept that maps out a social structure based on the reproduction of the behaviour and actions of individuals. Or as Massey put it: ‘A progression of different differences at one moment in time.’\textsuperscript{25}

\section*{1.4 Habitus. Trails}

The \textit{habitus} concept is not original to Pierre Bourdieu, but his own seminal use of the idea has been central to this research. The metaphoric essence of generative techniques, from the start, lends itself to this seemingly basic but ultimately complex depiction of interaction and development. \textit{Habitus} provided a visual framework to display dispositions and tendencies toward interaction and the consequences of those interactions. In its simplest form, one could imagine mapping the interactions of billiard balls around a table.

Bourdieu constructs an analysis of socio-historical predictiveness whereby everything is part of a generative system, where all parts of the trajectory of society are reflected in the previous incidence and the future incidents and every shift in being is a response to pre-conditions and informs all future shifts\textsuperscript{26}. It is a worryingly deterministic outlook, but in many ways has elements of the utopian. Bourdieu would go on to apply these ideas to the importance of a collective intellect to ‘contribute to a broader public enlightenment.’\textsuperscript{27}

This practice theory for Bourdieu is intended as an anthropological and social schema, but the ability to reflect this so implicitly as a cartographical exercise, as well as a by-product of visual-digital manual generation, demands an understanding and pronouncement of his theories.

US artist and theorist Lee Manovich provides an example of social mapping, in this case by observation of social media ‘selfies’ and other photos as data to create maps that are

indicators of time and social interaction. His web-based collaborative projects, such as Phototrails, help to visualise abstract concepts out of an exponential matrix.

Bourdieu uses habitus to further discuss the relationship of the individual to the structure, a moment of interaction that is directly implicit in this project.

The principle of the differences between individual habitus lies in the singularity of their social trajectories, to which there correspond series of chronologically ordered determinations that are mutually irreducible to one another. The habitus which, at every moment, structures new experiences in accordance with the structures produced by past experiences, which are modified by the new experiences within the limits defined by their power of selection, brings about a unique integration, dominated by the earliest experiences, of the experiences statistically common to members of the same class.

Artist Matthew Ritchie expands upon this kind of theoretic/scientific thinking when he discusses information.

The way my work works is: I’ve tried to build a model that can incorporate as much as it possibly can. It’s like this constantly expanding information structure that can just keep (theoretically) soaking up everything—but inside a way of seeing, so it doesn’t just become this barrage.

Put another way: what does it look like when information walks around the room? This is key to my process, as the visualisation and implied movement and confluence of the pixels I have extracted and replicated is manifesting around the gallery space as if with its own determinism.

Ritchie’s depiction of entropy and broad scientific patterns manifests itself in works that appear both cartographical and visualise theoretical concepts like entropy, in ways similar to Mehretu. This desire to manifest and visualise concepts informs my own depiction of the

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cartographical and the exponential, by offering an example of how metaphorical narrative can exist in an abstract artwork.

Figure 6. Matthew Ritchie, The Shapes of Space, installation Guggenheim NY, and The Living Will, oil on canvas, 2004.

This revealed the implications for choice and free-will in the generative method, even as I considered the physical space that the printed image would inhabit. The final manifestation of my artwork, having run a course based on generative reproduction and deterministic decomposition, addressed questions about the importance and existence of choice, and in doing so complete the strategy of a printmaker and fully and precariously plunge into digital reproduction. Concepts like habitus, entropy and causality (in forming deterministic outcomes) might take away free-will and choice from the equation. My work showed that it does not, or at least, that there is no simple dichotomy of ‘free-will vs determinism’.

It comes down to describing ‘the production of an infinite number of behaviours from a limited number of principles, permanent mutation, and the intensive and extensive limits of sociological understanding.’

Questions of determinism begged for another presupposition: that life is a series of events, and that innate systems and laws direct the flow of existential experience. It could now be applied as a methodology of image-making and a strategy for digital printmaking, in order to create abstract artworks. As the digital image is broken down to its components, redirected

and deviated into something new, systems manifest. To explore those propositions, however, a starting point was required. Not the origin, for there is none, but a source. The image.

Chapter 2 – From Image to Abstraction

2.1 The Source. The Agency of the Mark

Whether a copy or not (though most certainly a copy, because it is digital), the source, the image, could be the beginning of what media theorist Boris Groys might consider an exploration of its ‘invisible’ parts. ‘The digital image is a visible copy of the invisible image file, of the invisible data.’

This strategy began with the source, the image itself. Already the assumption I made, that the digitised image is loaded with pre-existing information, was essential. This was information that was separate to (and about to be separated from) the content represented by the image. Why this was an important distinction was a question posed by theorist Boris Groys as a consideration of the nature of the digital image as the accumulation of reductive phenomena:

> It has become possible, through the digital code, to reduce all forms of information representation into an unspecific language that can be retranslated into the various forms of representation. With the computer, all forms of representation and symbols become peripheral surface phenomena.

My generative approach used non-complex variables that processed the source components, in this case the pixels, of an existing image and created something new from them. The objective was to have the entirety of the new composition recycled from properties found in the source. Every part of the process was a replication of itself. The components were another layered form of the digital code that Rotzer mentions above. So while the work didn’t engage the digital binary code that is at the very centre of digital production, the use of pixels and layered matrices had the same fundamental relationship to the source image.

The purpose of the generative approach was two-fold: to link the outcome with the source in a way that implied the final completed work had a composition based on a path retreating

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backwards, and to create an artwork that was unpredictable and deterministic, in turn reflecting natural systems expressed in ideas of entropy and social experience.

In a preliminary exercise in drawing, I drafted an image in ink and used these individual marks - placed incidentally on the page via the act of fluid drawing - as the source of the marking that follows.

Figure 7. Entropical Housekeeping, detail, ink on paper, 2015.

These early examples reflected a desire to take each mark/component on a path, as if narrative can symbolically exist anywhere.

This was reflected in the work of Julie Mehretu and her ongoing approach to mark making, and the agency that a single mark could be given and how that can reflect a broader narrative.

'I think of my abstract mark making as a type of sign lexicon, signifier or language for characters that hold identity and have social agency. The characters in my maps plotted, journeyed, evolved and built civilisations. I charted, analysed and mapped their experience and development: their cities, their suburbs, their conflicts and their wars. The paintings occurred in an intangible no-place: a blank terrain, an abstracted map space.'

Mehretu explained that her abstract marks on canvases were a language for characters, also depicted by marks, that retain a sense of agency. She regards her work as charting the experience and development of these characters, both living and inanimate. To bring her

characters into contexts of time and space she began to include architectural plans and historical drawings to create a metaphoric, intensive view of time.\textsuperscript{35}

The point here was to fulfil a sense of narrative in an image, using its basic components as the source for its ‘beginning’ and create abstraction based on deterministic outcomes. The result would then be both pre-determined and organic from the perspective of the artist. The outcome would be to discover a way to navigate the image itself.

\textit{Figure 8. Julie Mehretu, Middle Grey, 2007. 304 x 426cm.}

\textit{Figure 9. Detail of Burley Stairs.}

Taking this broad concept of the individual mark and its agency, I adapted it into another method of generation, using formula and deterministic direction to create a unique abstraction. I applied linear boundaries to serve as points to divert the direction of the mark. For the sake of simplicity and experimentation the direction would be a correction of 45 degrees from the line. This would become standard as the method was applied to digital pixels, and simplicity of this kind was important because the complexity of the outcome relied on the multitudinal abstraction of many simple acts of deviation.

It helped to create a formula: Simple Deviation (of 45 degrees at deviation lines) × Constant Repetition = a Reductive System. \[D(45) \times C = S.\]

The nature of the visual outcome that was digitally generated was organic. Its growth to perpetuate itself and fluidly expand. While the connection between generative art and organic shapes is well explored, it was a key link between the visual systems and the metaphorical implications of the project.

Two possibilities exist in creating a visible formula with which to direct these marks: to lay out linear boundaries haphazardly and thereby create a random or intuitive formula, or have a pattern of lines, further restricting the artist’s decision-making.

Figure 10. Digital stage of Three Tiles, 2015.
Having established constraints for variables, the transference of this to digital was logical. The pixel replaced the mark: rather than draw an extension of the mark with ink and ruler, I replicated the pixel in the same way, stretching each pixel as a line, thereby using a method of reproduction unique to the contemporary digital matrix. Not just reproduction of the image, but the use of reproductive technology to create entirely new art.

Figure 11. digital stage of Carry On Ray. 2015
This was hinted at in Gerhard Richter’s *Strip Paintings* in 2012, where Richter took a pixel-wide wedge of his own earlier paintings and produced a stretched repetition. The act of taking a pixel-wedge was something I conceived independently of discovering Richter’s experiment, but non-the-less was motivated to take the ‘wedge’ to extremes. I replicated the action of wiping paint as a digital replacement for painterly action, the benefit being the potential for the implication of perpetual reproduction, and so, perpetual narrative. *Ad infinitum.*

*Figure 12. Gerhard Richter, 924-1 Strip, 2012*

The path of the pixel was an automatic placeholder for independent objects of agency. The pixel became part of a larger migration, following a path of constraints that allows for deviation, confluence and dissipation.
Figure 13. Process documentation, digital, 2015.

Figure 14. DeadCity, digital image, 2016.
2.2 Back to Data

The appeal of the ‘agency’ of the mark was the product of an early interest in psychogeography, which developed into a desire to create maps of experience. In effect, this project adjusted the premise of psychogeography beyond the immediate experience of the urban environment to a form of mapping of existential experience. The manifestation of this evolved by the method of digital stretching and created a form of psychogeography where data was collected and processed. The method of this processing created a culmination of multiple variables. The resulting pattern was the narrative outcome of psychogeography, that is, an expression of experience.

This is why data was required in the form of images. The final pattern was the culmination of the same components, only deconstructed from the image of origin. This was a visualisation of thermodynamic law: there is always the same quantity of matter, the same components of the universe, just rearranged and adjusted.

The abstraction of that data was also an act of navigation of the source image itself. The components of the image were important for the act of abstraction, the source of the image was important for the metaphor, as they provided an indicator for the real-world elements that were my own documentations of experience: images of urban decay, detritus, maps and memories. In that way are a little code of reference for the audience.

This scientific attitude was also evident in Matthew Ritchie’s focus on information, experience and the systems which direct it. This culminated in a large sculptural work titled *The Morning Line* that sought to describe the ‘whole spectrum of experience, simultaneously’.

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Ritchie speaks often of mapping and of the falseness of the dichotomy between figurative and abstract, a perspective that lends itself to this research.

The so called dichotomy between abstraction and representation. There is no dichotomy, there is no duality, there never has been. Everything in this room is the manifestation of purely abstract forces. We are abstract. This thing we have managed to convince ourselves of is a confusion between these strange forces and what makes up us.\textsuperscript{37}

The process method complete, and data collected as raw digital images, the components of the image were replicated and stretched in straight lines. This stretch creates a trajectory for each component that is adjusted by variables: linear boundaries extending from the edges for a series of inter-laying squares, placed in rotating formation. The direction of the trajectory adjusts itself to a right angle upon meeting a boundary as a form of uncomplicated variable. The result is the composition of an image from the decomposition of an image.

The visual outcomes of this process were intended to be unpredictable, and lack of power over the outcome was intentional. Any decision-making about how to adjust the process for the next stage of work would therefore be reliant on the outcome of each phase.

The method produced an random outcome, when one understands that ‘accident’ is the product of a series of causal actions that is by definition, not immediately predictable. This is probably acutely familiar to anyone with an awareness of abstract expressionism in its many forms. Already, early in the research, the digital process naturally mimicked an act of abstract art-making. I say ‘mimic’, because this is still a manually-driven process, hardly Jackson Pollock letting paint fly. But the natural laws at work were fundamentally the same.

The outcomes of this generative process suggested that the ‘random’ and ‘intentional’ were indistinguishable, just as the decomposition was in itself composing something new. An abstraction was left, that theoretically could keep building on itself, while always maintaining its association to a source. The source was arbitrary; a moment in a never ending system. The creation of arbitrary origin points and paradoxes was the method of navigating an image – via the act of decomposition – which by definition should have provided clarity, but, actually rendered the image beyond recognition. The idea that the image was only a collection of components reinforced itself.
2.3 Digitisation as Drawing

Creating artwork using digital software, in a manual fashion – effectively creating a drawing – meant the work inhabited an undefined area between digital and analogue. The act of drawing is an analogue act. I manually directed and created imagery, mark by mark. But the result was reliant on the pre-existing digital structure of the source images.

Pixel bleeding is nothing new in digital art, as shown by glitch artists like Takeshi Murata, who engineers ‘error in order to display a cascade of ghostly imagery that reworks representational images into a riot of color’. Takeshi and ‘glitch’ artists use error and accident to highlight the structure of the image, and draw the viewer away from the taken-for-grant imagery in front of them.

Murata’s techniques involve a form of data compression known as datamoshing or ‘pixel bleeding.’ Its very name bespeaks the organic-computer hybridity that typifies Murata’s work. The use of video compression artefacts is a subset of glitch art in which artists exploit technological error so as to create new images and sounds.

The ‘datamoshing’ in my research was far more intentional, where the reliance is not on error, but rather on formula. This formula maintained the method of the ‘accident’, though not informed by digital error making, instead by using the pixel ‘bleed’ as one would ink on paper.

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39 Zinman, G. Ibid.
Unsurprisingly, out of formulas, patterns emerge. The outcome that was most compelling was the effect these patterns then had on the visualisation of a space. That is, an abstract space that is neither figurative nor void.

These three works represent the outcome of this stage of the research. By the end of the first year’s research it was clear that what Julie Mehretu described as a ‘third-space’ is an inevitable product of depicting these systems.
In this sense [it] doesn’t map out a single space…Rather, it constructs what Mehretu herself calls a ‘third space,’ a term that provocatively designates the visual relations between architecture and gesture, representation and abstraction, a relationality that remains determinedly and productively uncertain.40

The time had come to further define for myself abstraction. I considered abstraction in three possible ways: abstraction in the ‘painterly’ sense – an organic process that is composed without accurate representation of physical reality; in the ‘conceptual’ sense – the act of abstracting something, whether by filtering ideas, or concepts (in this regard, abstracting the information from the image); and in the sense of ‘graphic’ abstraction – where colour and form are truncated and systematised to represent something. In doing so it is clear that the results so far operate in a grey area between these three different definitions. That medial area between forms of abstraction fitted with the medial position I’d already dealt with: where print, digitisation and drafting were conflated in such a way that, rather than over-burden the process with many methods, achieved some aesthetic control of abstraction.

41 Rudolph Arnheim and other twentieth-century writers would describe it thusly, however there is rarely a specific agreed definition beyond that simple notion.
Chapter 3 – From Abstraction to Habitus

3.1 Measuring Space

The implication of ‘space’ as a concept was evident after the method of image-decomposition began to take form. Not only was an effect of abstraction an inevitable outcome, dimensional properties coalesced through the procedure. By following a basic logic and continuing a formula, natural laws manifest visually. This is a depiction of space as a ‘continuum’ that was investigated by Panofsky in his assessment of the evolving nature of space in art. He describes space as:

...The world is conceived for the first time as a continuum. It is also robbed of its solidity and rationality: space has been transformed into a homogeneous and, so to speak, homogenizing fluid, immeasurable and indeed dimensionless.\(^{42}\)

If the concept of space is evolving, and is linked to modern progressions of thought-concepts, perspectival values within that space were essential in the discussion of my work. The space is no longer a physical one, and the abstract nature of the image starts implying multiple metaphorical meanings. Henri Lefebvre has informed this introduction of ‘space’ by insisting on an understanding of space as a social construction, a multi-faceted description of the nature of spatial perspective.

...the modern field of inquiry known as epistemology has inherited and adopted the notion that the status of space is that of a ‘mental thing’ or ‘mental place’. At the same time, set theory, as the supposed logic of that place, has exercised a fascination not only upon philosophers but also upon writers and linguists. The result has been a broad proliferation of ‘sets’ (ensembles), some practical, some historical, but all inevitably accompanied by their appropriate 'logic'.\(^{43}\)

Perspective, while still rooted in the organic mathematical nature of my images, need to adapt to the ‘space’ they were creating.

Panofsky talks about perspective as linked to, and an invention of, a particular period of time. In the case of mathematical spatial perspective, he linked this to the Renaissance, a time of architectural invention and commercial expansion, stating it manifested the cultural


imperatives of the time to 'measure all things'⁴⁴. I applied this perspectival theory to these early digital images.

The trajectory of the stretch through dissipations and confluences became thicker, more transparent and criss-crossed with finer 'younger' parts of the image. Every mark in these works was derived from the lines of a small but simple old map. The angles and mathematical logic of the formulas lent itself to a sense of topography that was multi-layered. The outcome of layering was pushed further when I began printing, and very much informed my decision to experiment with transparent surfaces such as acrylic sheeting. But it was the sense of abstract perspective – a differentiation between closeness and distance – that began to shape what I realised was a united space, not only mathematical, but mental and social. Lefebvre considers this space in terms of a unitary theory:

The theory we need, which fails to come together because the necessary critical moment does not occur, and which therefore falls back into the state of mere bits and pieces of knowledge, might well be called, by analogy, a 'unitary theory' the aim is to discover or construct a theoretical unity between 'fields' … In other words, we are concerned with logico-epistemological space, the space of social practice, the space occupied by sensory phenomena, including products of the imagination such as projects and projections, symbols and utopias.⁵⁵

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If perspective and space are thus so artificial and an interpretation of period-specific cultural iconography, my research applies to the contemporary cultural observation of complete global and scientific dissemination. These habitus-like organic forms contain a trace of the new ‘perspective’ in just the way Panofsky describes. The use of vanishing point for Panofsky was itself an iconic development in art perspective and an embodiment of the time’s preoccupations. Here the vanishing point was obsolete, while formulas and dimensions remained.

3.2 Regulated Improvisations

In the abstract-come-dimensional tilt of my procedure, I pushed and developed a sense of this time’s perspectival embodiment: a global, homogenising, quantum theoretical, non-binary time. It is not quite a reversal, but a change in direction from Panoksky’s observation that ‘perspective transforms psychophysiological space into mathematical space’\(^{46}\). Mathematical space is becoming psychological space. Panofsky concludes:

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\text{It negates the differences between front and back, between left and right, between bodies and intervening space (‘empty’ space), so that the sum of all parts of space and all its contents are absorbed into a single ‘quantum continuum.’}^{47}
\]

In that sense, such a continuum was not a vanishing point, but an ever-expanding, entropic outward continuum. It set up the space with altogether different rules. The ‘index for spatial values’\(^{48}\) was the repetition of the pixel and the organic flow, rather than the geometric physical space.

US-Australian artist Jessica Rankin, a contemporary and collaborator of Mehretu, provided a recent example of what she called ‘mind-space’. Her work *Field of Mars* involves compositions and arrangements using ‘methodologies of chance’. Her threads interconnect predetermined points taken from sources such as maps and landscape, and the threading outward from point to point and between points forms the basis of a predetermined system.


\(^{47}\) Panofsky, E. 31.

\(^{48}\) Panofsky, E. 56.
The link between Rankin’s method and Bourdieu’s habitus was in interconnectivity and causal pathways, determining direction and, ultimately, the overall structure of the map. Habitus slowly presented itself in this body of work, the agency of each component acting with the same purpose as each of Rankin’s pieces of thread.

‘The habitus, the durably installed generative principle of regulated improvisations, produces practices which tend to reproduce the regularities immanent in the objective conditions of the production of their generative principle, while adjusting to the demands inscribed as objective potentialities in the situation, as defined by the cognitive and motivating structures making up the habitus.’⁴⁹

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The ‘Regulated Improvisations’ for Rankin exist at each dot-point, and act as intervals that dictate the progress of the direction of thread. The same dictation occurs in my method, for the same reason, but manifests as a linear barrier that adjusts the direction of the digital ‘thread’. Another way of looking at it is that the source images of the work are dot-points from which things thread outward. There are less dots, but the threads become more complicated. Regardless, the outcome is the same: a methodology of chance that, through motion and direction, creates a system and a space.

The next exploratory step was to adjust and play on the methodology of chance. The linear barriers I had set up would need to be placed differently than the symmetrical right-angles I began with.

I decided to create greater randomness by dropping wood skewers from a height, as a way to integrate physical chance into the equation.
D (45) x C = S still applies to this experiment, but in variables pertaining to the nature of the structure. The outcomes reinforce the over-all idea that the seeming chaos of chance within a system still retains the habitus nature that permeates all of the work.
Figure 23. Digital process detail, Homebound, 2016.

The spatial quality of the final work, such as in Phorical Planning, Burley Stairs and Carry On Ray, as shown above, creates a careful intersection between Mehretu’s ‘third space’ and the habitus, whereby the symbolism is in every line of pixel, representing each reduced element of the greater structure. Bourdieu regarded his theories as a ‘transcendence of the objectivist-subjective antinomy.’\(^5\) This becomes clear in an abstract space that seems to represent both the nature of a system of mass interaction and connectivity, while simultaneously defining a personal map of thought and experience. The only act left is to let that information, as Ritchie might say, walk around the room.

Chapter 4 – From Habitus to Outcomes

4.1 To Print

From the image, the information spread and splayed into a spatial form of habitus, the work so far was comfortable in the digital matrix and away from the gallery.

The question of physical space, printing and finishing had been looming large from the beginning, if occasionally forgotten in the fixation of the digital method. I ultimately found that manifesting the artwork as prints and thinking about how to extend that feeling of dimensional space would conclude the work. A choice is now presented. It could easily be left as digital images, projected or available solely on screens in a space, perhaps online, or downloadable. These options would contain their own implications in regard to Panofsky-inspired spatial understanding. The other choice was to consider the options for printing, to make a physical object, and to think about the relationship of that object to the abstract and cartographical properties of the images. In many ways, printing into the physical emphasised the abilities of the digital process. Groys considers this when he turns to the gallery space:

> It becomes unavoidable to bring the digital image back into the exhibition space. [It] opens up the possibility for us to reflect not only on the software but also on the hardware, on the material side of image data…The positioning of the digital in the exhibition space makes it possible for the viewer to reflect not only on the superstructure but also on the material basis of digitisation.\(^{51}\)

This becomes evident in Marilene Oliver’s projects utilising printing, plastic and body-mapping. They highlight the possibilities of printing from data and producing something that is not just a print, but is also spatial. The line between sculpture and print is already blurred due to the advent of 3D printing, and the method of digital work I am investigating, just like Oliver’s, sits comfortably in between the two.

Oliver’s body of work, *Le Grand Jeu*, (2007) documents thin vertical strata of a human body, printed to clear plastic and assembled in such a way to create a seeming acrobatic movement of the figure. The use of body scans is a reflection of the desire for knowledge, in this case the intricate components of a body, contrasted with the inability to truly know.

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Similarly, in my work, the deterministic nature of the formula contrasts with the inability of the artist to truly know the details of the resulting artwork.

The use of layers of transparent acrylic sheeting came from this thought-process. The semi-opacity of the digital print onto the transparency of the sheet renders a muddled depth to the design. The works gained an organic fluidity by virtue of the shadows and physical layers of the materials.

Figure 24. Phorical Planning, digital print on acrylic sheeting, 120 x 120 cm, 2016.
In *Phorical Planning* (2016), an early example of this, the murkiness of the black, and the reflective jumble of the unprinted sections of surface, were the result of experimentation with layering. The many levels of ‘blackness’ maintained a natural nuance not quite achieved so far.

As with Oliver’s Dervishes (2007), the flat maps, when combined, became a synchronised whole.

![Figure 25. Marilene Oliver, Dervishes, Dye Sublimation print onto glass organza, each sculpture 215 x 40 x 30 cm, 2007.](image)

Oliver’s 2010 work *Protest* goes further, and backwards, by unravelling the printed accumulation objects, into an organic spillage of its varied colour parts.
Oliver’s approach to the body reflected something less tangible: the space that culminates in the digital process. In my artwork such layering produced a similar effect, unique to the physical space, based on subtle shifts in the perspective and depth: reflections of acrylic sheeting paired with the matt finish of the printer ink.

4.2 Physical Qualities

*Phorical Planning* (2016) was the first printed work to manifest this aspect, and reaffirmed the importance and significance of printing out and creating an object. With the work on screen, the flat aspect detracted from the action of the image-making. By making a semi-transparent layer on the files for printing and allowing the physical properties of the pigment, ink, lighting of the gallery space and surface of the acrylic to create a natural visual combination, a new tool, that of *incident*, unfolded. By creating subtle transparencies to hint at the layers beneath through the digital ink, intermingling with the reflective surface, the unknowable nature of the outcome provides an apt conclusiveness to the entire strategy. I was reminded again of
Matthew Ritchie’s lectures and the limitations of dichotomies, such as figurative versus abstract, and unpredictable versus predictable. In a quantum sense, two things can be said to be happening at once. The unpredictable accident, that is in fact, a predetermined outcome, as Ritchie succinctly explains this.

We use systems of chance. A patina of accidents for what is the true accidents, which themselves hide a true predictability. There is a system underneath, but it’s a system we don’t like. We make up systems of chance to hide ourselves.52

Figure 27. Three outcomes: digital form, printed layers and reflective surface.

The act of printing also explored the potential of commercial means of reproduction. The use of printmaking techniques, and the historical derivation of printmaking from commercial/graphic uses has been present from the beginning of the project.

Direct printing to the surface of the acrylic had a dual benefit of cost reduction, labour reduction and the ability to moderate the opacity of the pigment. The reflective surface of the sheets carried another physical-incidental outcome, allowing the works to engage the rest of the gallery space, hinting at the repetitions around the room and constantly alluding to the narrative at play.

In considering the gallery space I wanted the work to inhabit the physical space of the gallery, but without the confines of the Perspex. In essence, a mural that could more clearly describe the movement and composition of this work. My intention from early on had been to attempt large-scale printing to adhesive vinyl, so the work might leave the wall and encroach on the floor and under the other works.

Ultimately, the project was validated by being present in a physical space, merging with the physical qualities of the materials. If I tackled a purely print-media theoretical context of the digital, considering the digital matrix as Paul Thompson does, the project would have been well served analysing online interconnectivity and the nature of the screen. Though perhaps more conventional, the physical attributes of the ink and pigment and light were the necessary manifestation of these ideas.
Chapter 5 – From Outcomes to Bookends

5.1 Choice Problems

The idea of choice presented itself throughout the process of developing and printing these images. This was despite one of the research’s intentions, which has been the creating of self-perpetuating causality. The constraints of time require the maker to make a choice about when to stop the method; the pixels, theoretically, could continue to bleed pre-determinately, indeterminately, *ad infinitum*. But the constraints of knowledge require that the audience be able to perceive the action of the image, before it homogenises completely, as it does the more the pixels bleed. These choices seem obvious. But the moment of choice-making, when it comes, opens up new questions, not just about composition, but about the impossibility of properly embodying complete motion and entropy.

The homogenising effect was an outcome created by printing the first of the works on acrylic sheets. The ‘muddied’ blacks and colours implied more than it revealed. This tension between knowing and not knowing was explored in two later works, where the muckiness of the layered ink was tested with limited colour and hue.

*Figure 29. Detail of digital print on acrylic sheeting. 2016*
The tension between choice and determinism once again creates a direct parallel with the issues inherent in habitus and discussions of free will.

Mathieu Hilgers counters suggestions that the habitus is an antithesis to free-will and choice in *Habitus, Freedom and Reflexivity*:

Habitus generates an infinite number of behaviors from a limited number of principles. It is a generative system composed of limited, transposable principles. The agent incorporates rules throughout his or her socialization and social trajectory; these rules are few in number but determine a representational matrix as well as a matrix of action. The formal rules at the heart of these matrices' functioning are limited but transposable to a plurality of contexts, and their content can vary infinitely.\(^{53}\)

Hilgers identifies how these systems exist only as a succession of entirely free choices. They exist in a limited variety of possibilities, a variety too multitudinal to be predictive to any individual, but as a whole are nonetheless constrained in limitation.

The imposition of non-continuation strongly implies to the viewer, through absence, the idea that these systems and progressions could, and theoretically do, carry on indefinitely. Without choices being made, however, the systems have no impetus. The choices are a part of the structure that defines reality. This is the same as saying life has no meaning without death. And because death is a certainty, we already have at least one predictive outcome. Ritchie concludes his lecture on this theme:

> Individually you know a lot more about your future. You know you're gonna go home, you know you are going to do this, you know almost as much about your near future as you know about your immediate past. Only in the middle distance do things become a little obscure, and then of course we all know exactly what's gonna happen to all of us at the end: we're all gonna die. With a 100 per cent certainty that we're all going to die, so in that sense we can all see the future with perfect accuracy. It's really just a question of when, and that means you can grade on a curve.\(^{54}\)

Rather than see determinism as somehow grim and nihilistic, this strikes me as utopian in its purpose and connectivity. The outward movement of the universe, physically and abstractly, shows that all things run their course, and make way for other things. A meta-narrative with meaning (or lack of meaning) far greater than any given moment.

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Julie Mehretu describes her interest in ‘what Kandinsky referred to in ‘The Great Utopia’ when he talked about the inevitable implosion and/or explosion of our constructed spaces out of the sheer necessity of agency.\footnote{Mehretu, J. and D. Fogle (2003). Julie Mehretu : drawing into painting. Minneapolis, Minn. : Walker Art Center, c2003. 1st ed.}

5.2 Naked Reality

In the context of both Druckery and Matthew Ritchie, the ‘explosion’ and utopia could be seen, not just as a necessity, but as another stage of discovery. By extension, this explosion then became a method of navigation, and of mapping. To map the course of things, future and present, offers a particular mode of representation. Although Mehretu talks about constructed spaces in terms of physical buildings and social conventions, the outcomes of the discovery, or truth, make the utopia the same as Plato’s cave shadows, or Deleuze’s rhizome: the naked reality.

Once comfortable with the inevitability of making choices in seeming contradiction to the potential of randomness, and the anticipatory curiosity of determinism, the project required its bookend. One final marker to embody the incredible flow of information that manifested itself through the production of the work.

In keeping with the act of extracting single lines of pixels, I did this from finished images, after the pixels had bled, and the information had abstracted. I took pixels - one vertical axis, and one horizontal - and performed the gesture that was the genesis of this method. The pixels are digitally pulled to cover the length. Across. Then down. A simple tartan pattern. This becomes the most succinct way to express the information extracted and the directional attributes of the form. The randomness of the pixel order, and the simple predestination of the criss-cross action.

Gerhard Richter’s Strip Paintings are an example of this. I took a different approach by eschewing precision, and allowing a small amount of incident to remain in these, a reference to the contradiction of choice and determinism.

To avoid too clean a pattern, and allowing for more incidental form, some of the ‘bookends’ were stretched from wedges that were more than one pixel thick. These imperfect deviations
from a single wedge of pixel acted as a final game of chance, as a slight change in pixel colour from one row to the other, created an imperfect, muted grid. It is a slightly deviated condensation of the properties of what was, in the very beginning, a figurative image.

They are a subtle code, identifying the distilled information that has produced every visual outcome. They are the meaning, and the lack of meaning. All that is left is to start the process of pulling the pixels through a system, this time with the tartan bookends as the source.

The implication that perpetual reproduction is imaginable is the successful outcome of the process. The distillation evident in the tartan, and revolution back to taking a place as a source, completes the aesthetic process as well as the metaphoric goals of the research.
Conclusion

One way or another, everything is information. By accessing the information contained within images, I created a context within which I could explore a process of abstraction. Through that I found an accumulation of space within which to ask questions about experience, choice and existence. The appeal lies not just in the metaphor, where the confluence and dissemination of these elemental pieces of data interact and deflect, but also in the ability of such a process to disentangle the hidden information within. This recycled information is a reflection of a reality in which nothing can be added or subtracted, only re-ordered and recomposed.

I began with a visual concept, basic but with the potential to gain a more complex nature. It would eventually undulate into a space of action and thought. From the components of a drawn picture, whether with ink or pixel or paint, the individual mark was replicated in such a way as to follow a predetermined path. As this is applied to every mark, the accumulative paths take on the characteristics of a stretch. Carefully forced toward points of deviation, the paths begin to form a larger impression of structure, of movement, of space.

From the start of this research I have been concerned with the basic source, whether that is an image, a pattern or random data, and to extrapolate from that, in a way that reflects entropy and movement. In the case of this research I utilised the capabilities of digital reproduction to replicate information on a pixel-level. These pixels then gained the agency intended, producing intricate outcomes from slight variable deviations, resulting in a closed system. So, in practical terms, the method that I used expressed itself in simple replication and deviation. The basic component of an image, in the case of my digital works, the pixel, is replicated in such a way as to be stretched and spread in a linear path until blocked and adjusted. These deviant barriers diverted the trajectory and allowed me to create an equation that served as a set of rules to restrict movement, and also to define it. Once passed through these formulas, the information extracted from the source became an abstraction in itself.
It is the natural laws\textsuperscript{56} that dictate systems creating the abstraction. Expansion and degradation, concepts that sound like entropy, are mimicked through a process of digitised generation, images are decomposed and taken on a path, made possible through the technological ability to reproduce the pixel. The implication is that perpetual reproduction is the successful outcome of the process.

When viewed through the lens of the dissemination of information, another side of this method emerges. If information is being extracted, decomposed and recycled into a system that reuses every component, then the information is both the abstract and a representation. When deviations and confluences allude to interaction and linear narratives, what emerges is a schematic, a type of map that speaks to a sense of experience. This idea of experience is alluding to a medial area that exists between two dichotomies, and also represents both: in this case a particular experience of an individual, and collective experience over time. By doing this I am stating that the same patterns and rules, and therefore the same outcomes and meanings, exist in both. Social interaction, events and courses are locked into a space that is self-perpetuating.

The implications are worrying when we think about the potential loss of choice, free-will or perhaps even meaning in the reality that this visual process is emulating. The visceral discomfort that we feel at the thought of pre-determinism potentially makes us ignore the broader narrative, until we realise that, as a map, the very thing it is charting is choice. We realise that there are certain inescapable truths that contain our choices and inform our deviations. The visual outcome of the inescapable truths, then, has created intricate abstract spaces with a massive scope for difference and variation.

Understanding that, we look back and assess the information that has been extracted, which in the case of this project comes in the form of colour, arrangement and the hidden results of coded layers that perpetuate themselves, but in an even deeper level of unpredictability.

Some things seem easy to predict until the hidden elements are expanded and intensified, and what actually makes up the pieces of a given thing are surprising. Regardless, with this

\textsuperscript{56} Physics, entropy, all the rules that guide the physical and theoretic cause and effect of nature.
information the process can continue *ad infinitum*, having all but forgotten the structure of the source image.

The distillation that is evident at this point, and the revolution back to becoming the source, completes the aesthetic process as well as the metaphoric goals of the research. The only loose-end is that blurred space between choice and determinism. As I have shown, it isn’t a loose-end at all, but a substantiation of reality. These structures of thought-space, where paths coalesce and deviate, provide a way to express an internal understanding of experience and existence. Confined but free, relative but homogenised, and ultimately a single pixel of colour and code replicating itself, affecting others and dissipating into entropy.
Bibliography


Appendices
Appendix 1 To Take Time Out of Nature, digital print on wallpaper, 300cm x 800cm. 2016.
Appendix 2 *Burley Stairs* (Wellington), digital print on acrylic sheets, 120cm x 120cm. 2016.
Appendix 3 Alien Theories, digital print on acrylic sheets, 120cm x 120cm. 2016.
Appendix 4 Diptych for Doreen, digital print on adhesive vinyl and acrylic sheets, 100cm x 200cm. 2016.

Appendix 5 Installation of Study in Entropy, 2016.
Appendix 6 Stop Me Flying, digital print on acrylic sheets, 120cm x 120cm. 2016.
Appendix 7 'Phorical Planning, digital print on acrylic sheets, 120cm x 120cm. 2016.
Appendix 8 Record Breaker, digital print on acrylic sheets, 100cm x 100cm. 2016.
Appendix 9 Bookend, digital print on acrylic sheets, 100cm x 100cm. 2016.
Appendix 10 Installation of Study in Entropy, 2016.

Appendix 11 Installation of Study in Entropy, 2016
Appendix 12 Installation of Study in Entropy, 2016
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