

The Photogrammetric Image and Black Boxed Mutative Automation considered through Philip K Dick's "The Preserving Machine".

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The Preserving Machine, is a multi-media research collective initiated through collaborative interest and discussion in response to the relationship between new imaging technologies and historic understanding of the photographic. Initiated at LCC UAL in 2020 their research-practice has developed to encompass exhibitions, workshops and collective research papers. Their inaugural exhibition, the Preserving Machine, is a collaboration with the Implied Gallery, Digital Artists Residency (DAR) and Format21: Control.

Peter Ainsworth is a visual practitioner, researcher and course leader for BA Photography at LCC UAL. He is a PhD candidate in the department of Visual Cultures at Goldsmiths University and his research explores the relation between post-photographic and institutional knowledge claims posited through and with the technologies. His specific area of interest is the institution of survey museum spaces such as the British Museum. He is a contributor to Philosophy of Photography where he has written about LiDAR Technologies relation to historic Photographic practice through focus on ScanLab Projects' 'Lenticular Landscape' and a paper analysing the relation between Photographic process and Object Orientated Ontology. His visual practice focuses on usage of the photographic also uses A/R, Photogrammetry and video in the realisation of research projects. His work has been exhibited internationally and is held in the collection of the Museum of Fine Art Houston. He has been awarded a Pavilion Commission, Flash Forward Award, and was the recipient of the inaugural Dazed and Confused Emerging Artist Award.

Sam Plageron is an artist, module leader of foundation at South Bank University and is a PhD candidate in the department of Fine Art at Goldsmiths University. His practice explores the relationality of digital capture towards 3D printing techniques seeking to highlight problematic expectations in the language and experience of these different technological forms. His work also focuses on questions of current forms of 3d capture to biometrics, surveillance, facial recognition and forms of portraiture/life casting. Exhibitions include, False Friends, The Function Suite, London; Things on things, Maverick Projects, London; Image Object, Furini Arte Contemporanea, Rome; Tryouts, Downstairs Gallery, Herefordshire; Bloomberg New Contemporaries; Pop will Eat Itself, Art on the Underground. He was the recipient of a Henry Moore Artist Fellowship Grant and an award from the Eaton Trust.

Tom Milnes is an associate lecturer in Fine art at Oxford Brooks and PhD Candidate in 3D3 Fine Art/Media/ Photography at Falmouth University. His work and interests explore our relationship with technological cultures. He makes site-specific works which use different cultural responses to technology where artworks actively confuse time frames. His PhD work explores the possibility of the glitch in relation to photogrammetry and the potential of creative subversion through engagement with these computational anomalies. He has exhibited internationally including at: Gyeonggi International CeraMIX Biennale - Korea, AND/OR - London, The Centre for Contemporary Art Laznia - Gdansk, and W139 - Amsterdam. Milnes was recently the JOYA: arte + ecologia artist-in-residence and was selected for the MOSTYN Open. He is the curator and founder of the online platform [Digital Artist Residency](#).

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Abstract

The multi-media research collective, Preserving Machine was initiated through collaborative discussion in response to Philip K. Dick's 1953 short story of the same name completed in LCC during 2020/21. The group research particularly focuses on the precarious relation between the inputting of data through a machine as a functionally transformative act and the differences; physical, aesthetic, ethical and philosophical – that are embedded in new technologies. In the apparatus of these systems control, distortion, translation and possible mutation are replete but also prejudice, surveillance and understandings of worth and power are highlighted.

The paper consolidates ideas explored through discussion and particularly the possibility of Dick's text relationally towards contemporary image making apparatus and specifically through a shared interest in photogrammetric technology. Dick's protagonist Doc. Labyrinth's design and usage of the Preserving Machine resonates with processes of capture, expectations and naive hopes for what the technology may be able to achieve and the inherent problem of understanding these images from the perspective of both the user and consumer of the ostensibly 3D image. Structured to mirror the process of capture, to black boxed process, to raw computational image viewed in software constructed space the text highlights the problematic relation of delineating the image as a Fordist process of industrial image creation.

The text pays particular attention to how photogrammetry may not be limited to the language of photography posited by post-structuralist theorists and by Roland Barthes in particular. The authors propose that it is not sufficient in discussing these hybridized digital image forms solely through the language of index, likeness and simulacrum associated with photographic theoretical dialogue. Rather they need to be considered relationally to wider assemblages of meanings and expectations of photogrammetric images that are less readily understood through singular coherent theoretical readings

Keywords:

digital imaging technology; photogrammetry; preserving machine;
photography; Philip K Dick; computational image

Introduction

In Philip K Dick's short story, *The Preserving Machine*, 1953 set in a society of the near future ravished by ecological disaster and war, a scientist called Doc.Labyrinth becomes worried about the decline of humanity. Comparing his societies contemporary circumstance with the ruins of previous civilizations he seeks for a way of safeguarding (what he sees to be) the most ephemeral cultural artefacts of human achievement; classical music. His solution is to create a 'preserving machine' which transmogrifies sheet music into organic living matter; a Mozart score becomes a small bird with peacock feathers, the Beethoven score emerges as a beetle, 'stern and dignified'¹ and Bach's Forty-Eight Preludes and Fugues becomes a whole flock of 'round ball-like creatures'², whereas the Stravinsky bird is, 'made up of curious fragments and bits'³. We read Dick's story as resonating with a very human need to capture and arrest the world through photographic technologies. In this sense, the creation of the preserving machine remains a useful analogy to the promise of current imaging technologies in the sense that the desire to capture is an attempt to preserve. It is particularly resonant to current photogrammetric technology which, when incarnated in its raw state appears anomalous, incoherent and fragmented. We feel this to be similar to Labyrinth's creatures created from transmogrified sheet music that emerge from the preserving machine.

An underlying concern of this paper is the apparently scientific materialist process of technical apparatus; the act and control of preserving subjugated by ideologies and parameters of the preserving mediation itself. In this sense we view the character of Labyrinth as embodying an archetypal techno-capitalist but also the expectant consumer of the technology. In this paper we are seeking to use Dick's story to consider photogrammetric imaging produced through

algorithmically hidden processes, to problematize knowledge claims and expectations of emergent image making technologies. To this end the authors approach this thematic through three vantage points; *Processes of photogrammetric reality capture*, *Mutative black boxed automation* and *Unrealised image expectations*. These sections reflect upon Labyrinth's experiments with his preserving machine, which we consider relevant to the complexity of producing photogrammetric images created through current forms of computation. Image creation in this capacity is metaphorized through the experience of Dick's Labyrinth who stands in for an imperialist visionary determined to preserve not only forms of art that he feels epitomize human achievement. His tacit desire in this process is also to redeem the societal structure by him preserving the things he sees to be most precious for eternity.

However, Labyrinths act of preservation entails a misguided hope that technology will preserve his music for future retrieval. Similarly, it is a fundamental misunderstanding to think that 3D computational captured data inputted through computation will not undergo some form of distortion, translation and possible mutation. For the purpose of our paper we choose to focus on photogrammetric images from the moment of data capture by black boxed sensor to the creation of raw composite 3D image through algorithmic software calculations. With this rationale we are not discussing computer generated 3D images made in production studios that retain the sheen, surface and perfection of mass-produced objects. In this sense we follow the narrative of Dick's story in that when a amorphous creature emerges from the commands of the Preserving Machine it is an autonomous thing with an independent agency outside of Labyrinth's control.

While photogrammetric processes incorporate a post-production pipeline to where it is consumed, we intend to focus instead on what the raw product of the software is and to

posit that there is something difficult emerging that necessitates further consideration of these forms.

Throughout the text, we utilise Labyrinth's desire to preserve musical notation through metamorphosing musical scores into creatures by reflecting on current aspirations of 3D technological advancements. Whilst it is not the claim of this paper that the organic creatures Labyrinth creates are directly comparable to photogrammetry, nor that the ontology of music in this context is comparable to the interpolation of image data there are several parallels that we feel resonate between Labyrinth's process and the creation of digital photogrammetric images. Firstly, in Dick's text Labyrinth seeks to change two-dimensional information into three-dimensional forms, which retains parallels to the process of 3D capture that sutures the data from two-dimensional image frames to infer a three-dimensional form in constructed space of the software. Secondly Labyrinth retains no control over his output and feels dismayed at his lack of agency over the creations that emerge from his machine. Black box photogrammetric software processes too offer no insight as to the reasoning of their calculations (and are carefully safeguarded by software developers). Thirdly Labyrinth's creatures appear to be both wonderful and discomfoting mutations of their musical scores. Like his Preserving Machine, 3D software processes that rely on automated algorithmic computation manifest unexpected and aberrant results from the data inputted, producing not the totality or pleasing abstraction of the photographic image but rather forms with protrusions, fractures and partialities which are deemed errors.

We propose that there is something transformative and mysterious in what happens to digital photography through these processes which requires a development of

vocabulary and conceptualisation to contend with. Forms of 3D digital processing at this present moment seem to push digital photography to its brink, tearing and fracturing the analogue effects we experience in the digital photograph. With these processes' photography mutates, breaking into polygons, smears and icicles of unresolved form. These mutations may or may not remain detectable as the technology improves, but they create a visibility that is precious because it may be eclipsed very soon, and they harken at present a new condition of the image, one that is vulnerable, dislocated in its temporality, imperfect and ragged, while at the same time mesmerizing.

Processes of capture and 'reality'

This section firstly deals with the problem of conceptualising the process of photogrammetric capture solely through the language of computer science, to the extent that other forms of knowledge claims outside of the image as an extractive data input are refused in favour of foregrounding a technical understanding. In the context of Dick's character Labyrinth what becomes important is his positionality, in that he is an agent of preservation through the determination of what is being transformed, which is the perpetuation of narrow understanding of what constitutes valuable culture. In this sense we use Labyrinth's expectation of the mediation, and the choices that he makes as being synonymous with other forms of extractive process - which too have their origins in a colonialist project. What the narrator of the story determines as Labyrinth's, 'fine and tragic work' in the process of preserving chosen cultural artefacts, 'for all eternity' simultaneously determines the parameters of what he sees to be, 'all the fine and lovely things that would be lost in the reshuffling of societies'⁴. Labyrinth's hopes and expectations of the technology are inevitably going to be dashed because the way he is

conceiving the machine is through epistemology that the technology is neither designed for nor able to fulfil, specifically, the reproduction of his understanding of value, importance, beauty and his world through transmogrified computationally realised form.

Acts of Photogrammetric images creation can similarly be considered as a form of image that metamorphoses flat two-dimensionality of linear perspective photographs into virtual 3D space. In Jens Schröter terms the ‘technological transplane images’⁵ are created with the intention of moving away from flat two-dimensionality by reconfiguring the visual plane in what Jonathan Crary described as a “tantalising apparition of depth”⁶. Photogrammetric images need also to be read relationally to a transformation in the production and circulation of images within network culture, termed Networked Images⁷. Despite this, the argument posited is that inherent in the technical process of making photogrammetric images are suppositions and problematic relations towards the subject, where specific material features being captured may lie outside of the realms of computationally determined likeness. It is an extractive process in which the resultant computationally determined image is more a visualisation of the internal black box than bearing an experiential relation to what has been captured.

While we have stated that the language of computer science is insufficient to categorise understanding of photogrammetric imaging neither do we feel that discourse surrounding the photograph is substantive enough to discuss the mediation. We consider that a singular conceptual approach towards the photographic to navigate the complexity of this contemporary mediation is also inadequate. The reason being that computational rendering of digital photographs into 3D photogrammetric images has been facilitated by the evolution of increasingly complex forms of algorithmic

automation. This further complicates what Roland Barthes conceives to be the linkage between camera apparatus and photographic image that can no longer be perceived as literally an emanation of the referent⁸ when considering photogrammetric images. Sy Taffel elaborates on this further by stating that “computational photography’s reliance upon compositing multiple frames further undermines attempts to connect photography to indexicality”⁹. However, thinking about the image beyond the index and notions of likeness becomes important when conceptualising photogrammetry, as we need to account for the complex sociotechnical assemblages in which sensor, human interface and computational software integrate within defined parameters. It is necessary to think of the photogrammetric process as not only consisting of the singular sensor of the camera but multiple types of data import including operational metadata, geo tags, copyright information amongst other information captured in the image.

The manner computer science conceives of photogrammetry requires a fundamental reconsideration of how the camera as an apparatus is conceptualized.

In this sense, thinking of the camera solely as making a material image document through photography or video needs to be reframed by considering the sensor as an apparatus that records multiple forms of data for the purpose of being converted through computation. Computer science utilizes technology as being tasked with the reproduction of a Euclidian plane through an image, to camera as an operative agent and purposive tool in the creation of multi-dimensionality through algorithmic process. This represents a significant shift from the conceptualisation of the aesthetic, social, and political implication of the photographic image, though these concerns are nevertheless

embedded in the resultant photogrammetric image as they are derived from photographs.

It could be argued that the 'magic' or 'sorcery' of the camera image is extended onto the software's extrapolation of two-dimensional images into a 3D point cloud. The user draws a comparison between taking a digital photograph and the interpolation of multiple photographs to produce a 3D photogrammetric image. However, the information gathered is too spatially complex and exponential for the user to be able to comprehend the exactitude of how the 3D scan will be realized from the inputted data. As such the user accepts the automatic processes of measurements and calculations the software has arrived at, because the image has a resemblance to the inputted data and to the subject it captured. Mario Carpo points out that this involves the rise in usage of computational 'form searching'¹⁰. By which he means that algorithmic programming is now designed with such complexity that results are often beyond comprehension. Exhaustive processes of searching through algorithmically determined technology are so complex, in modern automated programming, that why the input of one image data set appears to work, and another does not, is completely black boxed and inaccessible to the human spectator.

It's important for the purpose of our argument to rehearse the technicalities of the process as we are drawing a distinction between the language of computer science and the language of photographic theory neither one of which is fit for purpose in understanding photogrammetric image creation. Image processing photogrammetric software is contingent upon a number of steps to transform the two-dimensional data collated into a three-dimensional model. The first is aligning the data that acts as the

scaffolding for the model that will be produced, establishing coordinate points of communalities across the inputted selection of images to form a point cloud. The 3D software displays how many points are detected across the inputted photographs, significantly it does not use all the images but relies on where common points can be matched. The selection of appropriate features is an exhaustive trial and error process as the computational algorithm determines distribution of specific features in the images.

The 3D scan produced is therefore not a complete translation of all the inputted image data, but a specific and intentional selection of corresponding points that are rationalised for the purposes of creating what the software determines as a complete scan. The second stage defined as reconstruction links all the points together to join the points into a polygon mesh. This visualises the data as an apparent 3D image shell. Lastly the software gathers so-called 'textures' from selected elements of the input data that appear to effectively be wrapped as a photographic layer over the 3D image to produce what Lev Manovich terms, *photorealism*¹¹. The illusion of the Photogrammetric image, rather than replicating a phenomenological experience is toward a perception of visuality experienced through the photographic. Manovich contends rather that the images produced through computer generated processes are photorealistic in that the desire is not to fake 'our perceptual and bodily experience of reality'¹² but that of the photographic image.

The objectivity mistakenly attributed to photography is also applied to 3D forms of capture including the photogrammetric image. Hito Steyerl makes a reference to the company Leica Geosystems and emphasizes how they state their, "Scanstation is objective and completely measures everything it can 'see' for later analysis and

diagramming.”¹³ Daston and Galison in their categorisation of photographic history stress that the medium itself and the process of automatic image production did not in itself constitute the rush for objectivity. Rather that the relationship of scientific objectivity was simple determinism. The photograph has been historically subject to being “criticized, transformed, cut, pasted and touched up, and enhanced.”¹⁴ However, they suggest that while photography was initially used as a substitute for drawing or engraving, it soon became advanced as “a distinctly scientific medium.”¹⁵ The automatism of the photographic process promised images that were free of interpretation and these came to be understood as objective images made through a machine.

The machine, in this instance, provided a new model for perfection which echoed the standardized nature of all manufactured goods. It is perceived as something, “patient, indefatigable, alert” and beyond “the limits of the human senses.”¹⁶ Daston and Gallison argue that just as the machines ability to observe, measure and record counteracted human weaknesses, so making the worker more productive, scientists too admonished their own judgements in favour of a “more hard, working, more honest instrument”¹⁷. Importantly they stress the most significant aspect of machine images is that they seemed to offer images that were “uncontaminated by interpretation”¹⁸. In this sense the promise of objectivity has never been actually fulfilled, either through photography or through current advanced imaging technologies, but these desires represent a continued search for pure and judgment free representation. These demands for scientific objectivity in the utilisation of photogrammetric technology have become associated with absolute technical mastery over automated imaging processes in order to avoid distortions or errors in output images produced from sensor data.

Hito Steyerl starts to unpick the aesthetics of the photogrammetric image through examining its phantom forms, holes, spikes and warped textures¹⁹. These artefacts emerge due to complexities of detecting spatiality from flat images, as well as the layered nature of the process; revealing that we are not dealing with a complex composite upheld by computation. The untidiness of the computational process of the preserving machine in Dick's text is the abhorrence that Labyrinth finds in the things that he is creating through the preserving machine as the unexpected effects of the process, which must have been inherent in the original input, emerge and are revolting to him, 'The creatures were bending, changing before a deep, impersonal force, a force that Labyrinth could neither see nor understand. And it made him afraid'²⁰

Black box processes and mutative automation

From the Fordist conception of the assembly line to current processes of mass manufacture, automation is embedded in factory methods ensuring a standardization and uniformity of object production. Similarly, the photographic image retains the abstracted perfection of the automatic (although this now is heavily enhanced through post-production). Much has been made of the automatic properties of the camera, how photographs are formed without "the creative intervention of man"²¹ bestowing on the photograph a "transference of reality from the thing to its reproduction."²² The promise of current 3d technologies appears to be that they too represent a mechanical transcription of the world. However, while cameras through the click of a shutter produce an image, photogrammetry though contingent on automatic processes remains much more transformative of its subject. 3D software necessitates data (multiple digital

photographic images from multiple viewpoints) and unlike the single action of the shutter, requires a number of steps (alignment, reconstruction/colourizing).

There is something fundamentally metamorphic about the process of changing two-dimensional information into 3D. It is the *creation* of an image/form from the data inputted that through a sequence of automated actions yields a result and yet these automatic software commands are distinctly flawed. The software produces not an integrity of a structure but instead a form both comprising “successful” alignments of points as well as unresolved sections manifesting a range of spikes/blocks that fill in holes where the data is missing. This is not the automation of industrial perfection but rather a mutative automation, a Frankenstein conjuring of its subject replete with imperfections. These formulations much like Labyrinth’s musical creatures retain and embody distortions. The software like the preserving machine is simply doing what it has been asked to do, but it is reaching its limits. The mutative appendages to the form are signals of these limits and they leave the creations emerging morphologically fragile. Just as Labyrinth cannot reconcile what emerges from his preserving machine, the 3D entities that the software manifests are a mesmeric mix of high-definition intricate detail along with almost cubist protrusions and growths.

What is striking with the sophistication of these technologies is that the automation produces such inconsistent and ragged forms of 3D. These momentous technological innovations have rendered a chaotic version of the world where textures and forms do not match, where the hard surfaces of mass production are rendered as misshapen structures. It is precisely the automatic functions that are producing these oddities. Automation that is not carefully monitored can easily go awry, lest we remember the

cautionary tale of the sorcerer's apprentice in Disney's *Fantasia*. Mickey Mouse, exhausted from carrying water up the steps to fill the cauldron, sees an opportunity to avoid his work through donning the hat of the magician who he is apprentice to. He summons a mop to anthropomorphize, the mop then acquires arms that can carry his buckets of water for him. What Mickey fails to realize is that his creation will continue to fill water in the pot until it overflows, causing mayhem. The mop incarnation has not been programmed to know when it should stop filling up the cauldron of water. Mickey perceives that he must destroy the mop automation he has created and proceeds to attack the mop through cutting it to pieces. However, the mop reassembles to not just one stick figure but multiple producing an army. This is automation at its most repetitive and dumb. The sorcerer returning to chaos, parts the flooded water and Mickey hands back his hat resigned to the fact he will have to carry the buckets of water himself.²³ This section of *Fantasia* and Mickey's wonder at the mop carrying out his work for him to then his utter dismay at being unable to control his creation reflects our ambiguous relationship to machines and to automatism, our simultaneous desire to control and relinquish responsibility.

Gilbert Simondon argues too that man has a conflicted relationship to the machine, that they both enable him and threaten him. Simondon writes that the machine is perceived "as the stranger"²⁴ but that it is the stranger inside the machine in "which something human is locked up, misunderstood, materialized and enslaved."²⁵ Machines are created by humans, our sense of the automatic is just how the machine was programmed by a human. Simondon stresses that worshipers of the machine "commonly present the degree of perfection of a machine as proportional to the degree of automatism"²⁶ However he suggests that automatism is "a rather low degree of technical perfection"²⁷

and that “A purely automatic machine completely closed in on itself in a predetermined way of operating would only be capable of yielding perfunctory results.”²⁸ Automation appears to promise that a machine can carry out actions better than ourselves, that they can remove the margin of error, to surpass our own fallibility. However, Simondon states the “progressive perfecting of these machines”²⁹ is actually dependent on a level of indeterminacy, a certain margin of control of the human over the machine. This calibration of the machine through the human determines the outcome of the object produced. Vilem Flusser posits another relationship of automation focusing instead on how machines are programmed. He draws a parallel between the program inherent in the camera’s design and how that determines its output. He argues that photographers are caught up in a game with the camera, trying to discover and play with its given properties. He describes this as a new kind of function in which human beings and apparatus merge into a unity. From this merging he determines that photographers are functionaries, that they know how to “feed the camera” and they know how to get it “to spit out photographs”³⁰

*The camera does what the photographer wants it to do, even though the photographer does not know what's going on inside the camera. This is precisely what is characteristic of the functioning of apparatuses. The functionary controls the apparatus thanks to the control of its exterior (the input and output) and is controlled by it thanks to the impenetrability of its interior. To put it another way: Functionaries control a game over which they have no competence.*³¹

Flusser states here a complicated equation between the automatic properties of the camera and the knowledge of the photographer, but importantly there remains a level of mystique as to the inner workings of the camera “No photographer, not even the totality of all photographers, can entirely get to the bottom of what a correctly programmed camera is up to. It is a black box.”³² This notion of a program already inherent in the camera, and the programmers of that machine actually encapsulates the dichotomy between the opaque and the transparent qualities of software processing. The impenetrable black box that Flusser refers to parallels what Wendy Hui Kyong Chun describes as the “invisibly visible.”³³ Chun argues that there is something deeply impenetrable about the way software is programmed. She writes that the computer is staged as “a provocative, indeed magical, model”³⁴ It contains a tantalizing combination of “what can be seen and not seen, can be known and not known.”³⁵ Chun states the computer’s separation “of interface from algorithm; software from hardware-makes it a powerful metaphor for everything we believe is invisible yet generates visible effects”³⁶ Chun earlier qualifies that as our machines disappear with screens, hardware components becoming flatter and flatter, “the density and opacity of their computation increases.”³⁷ Therefore, every use she argues is also “an act of faith.”³⁸ We stake a particular ideological investment in these “effective procedures” that is for any problem that “can be solved in a number of steps.”³⁹

The paradox of these automatic processes is that technological innovation that has pushed the planar into the three-dimensional has produced a discordant image, one that in its raw state differentiates itself from the surface of mass production as a significant other. It only becomes ‘acceptable’ through the intensive labour of post-production to remove its unsightly protrusions. Joseph Schumpeter characterized the replacement of

one capitalist form with another as symptomatic of industrial mutation⁴⁰ and we might too see these images as emerging and in some capacity mutating from their older image selves: cinema, photography manifesting a form of the monstrous underside of automation. And yet it is this monstrosity (that Labyrinth is unsettled by with his swarm of creatures) that with these new technologies is perhaps giving birth to a new image, one in contrast to a stabilized image with new conditions of morphology and visuality. As Rosa Braidotti emphasizes the monstrous contains a considerable charge “Metamorphic creatures are uncomfortable ‘body-doubles’ or simulacra that simultaneously attract and repel, comfort and unsettle: they are objects of adoration and aberration.”⁴¹ Braidotti states that the monstrous is perceived as a re-assembly of organic parts and that technological incarnations are a similar “collage or montage of pieces.”⁴² Here the composite relational aspect of the photogrammetric image reconstituting the inputted photographs into distorted textures and forms resembles Labyrinth’s hybrid creatures, themselves “liminal borderline figures”⁴³ between “music” and “animal”.

Expectations unrealised and category mistakes

As has been discussed photogrammetric models can be considered as simplifications of a terrain produced through a set of predetermined computational assumptions. If we consider the teleology of photogrammetry as a technological process designed to create exacting simulacra not only in terms of detail, but through feel, smell and phenomenological experience, a question of whether and how the mediation becomes meaningful is raised. The knowledge created within the application of photogrammetry is not that of a perfect simulacrum not least because multiple sensual features are

mediated in the technological process. It is an interpretive process of image creation, through non-invasive data capture processed and interpolated through black box computation. This difference between the imagination and the reality of the technological process is at the heart of Labyrinth's disappointment of the preserving machine and further can be seen to align with Virilio's position that, 'totalitarianism is latent in technology.'⁴⁴

Finding correspondences in aligning photographic images to form the 3D form becomes the problematic task. As it is here that substantial errors in computation and accuracy occur, showing a discrepancy between the thing captured and the construct of the software, an equivalence mediated through certain sensual features. Here each aspect needs to be regarded as part of an assemblage where agency in terms of physical, aesthetic, ethical and philosophical properties are embedded in the realisation of raw photogrammetric image. If we consider the teleology of the technological process to be a desire of mapping a terrain, with as much accuracy, through all possible photon wavelengths, to a subatomic scale of highest resolution, rendered instantaneously there seems to be a category mistake evident. As even in this context it is not expected that the model will become the terrain in the manner of the map in Jorge Luis Borges', *On exactitude in science*, 1946. The map in this story attained such perfection beyond previous scaled 'unconscionable maps' that it became a one-to-one simulacrum of the empire. Despite the accuracy of the map produced, there will always be an essential difference between terrains and epistemological meaning foregrounded.

What becomes interesting in the experience of raw photogrammetric images displayed in the software space is the apparent fissures between input and output. The

discontinuity between map and territory, between alignment of image data captured and processed photogrammetric image, as it is here limitations of the mediation, and expectation of significance as relation emerges. The gap between allowing a new and specific kind of alignment demands a disparity in the manner the assemblage enacts resemblance. In Latourian terminology, “correspondence”⁴⁵ is not as dependent on accurate representation as about referentiality and knowledge depends on the fissure between modes, rather than mutual identity. ‘We shall try to insert a wedge between two modes that have been amalgamated with each other so as to respect two distinct passes and register the effects of this category mistake on which, one thing leading to another, all the others depend.’⁴⁶

Latour conceptualises different modes of existence as residing in the process of dissembling relationality. The relation between links of an assemblage determine where there may be discontinuities. A perfect representation, an exact coincidence of knowledge or the thing-itself represented would be inert in terms of building meaningful connections to any sort of knowledge. In this sense the question does not become ‘to what extent is the model like the thing modelled?’ but ‘what the relation between these actors is and what is implicated in the act of modelling?’, as ‘your hands are dirtied by the operations you have carried out to maintain in working order the networks that give direction to your practices.’⁴⁷ The photogrammetric assemblage serves as a mediating function to the knowledge sought through them. To the extent and manner that the model bridges certain sensual features of the terrain scanned and, in a relation, that the spectator is able to discern

A process Sarah Pink conceives to involve, ‘understanding the sensoriality of images as something that is generated through their interrelatedness with both the persons they move with and the environments they move through and are part of.’⁴⁸ In this sense the experience of photogrammetry through the mediation of the software space could be categorised as a process of, ‘comprehending how images and other materialities, sensory perception, discourses, persons and intentionalities might cohere to constitute economies of power and relatedness in specific situations.’⁴⁹ Rather than extending an understanding of images as a dominant mode of visual discourse the implication is that images are produced and consumed through the place they are viewed become meaningful in this state of transition. They should not be perceived as a static surface, but a shimmering feature in the wider assemblage of which they are part and inextricably linked.

In this sense Labyrinth’s Preserving Machine perceived as a transmogrifying black boxed process also highlights a control system that resides outside direct intentionality. Similarly, N Katherine Hayles’ understanding of unthought and definition of nonconscious cognition⁵⁰ references processes which lie outside of consciousness, moreover, cognition expands beyond traditional parameters and equations with (human) thought. A visualisation where there is no cognitive hierarchy, where processes lying within our conception of cognition, are vastly outnumbered by those nonconscious and material which lie without. In other words, diversifying our consideration of the photographic to include further reference to the material and non-conscious facets of the mediation – including the agency of algorithmic computation - instead of limiting ourselves to consideration of the photographic image for human consumption. Consequently, to read the photogrammetric solely through the capacity of the image

ignores the wider paradigm in which, we contend, the ontology of the mediation is situated.

As Ed Finn, in *What Algorithms Want: Imagination in the Age of Computing*, 2017, states,

*'every culture machine we build to interface with the embodied world of human materiality also reconfigures that embodied space, altering cognitive and cultural practices. More important, this happens because implementation encodes particular formulation of the desire for effective computability, a desire that we reciprocate when we engage with that system'*⁵¹

Labyrinth uses technology not as being relational to the real as such, but being synonymous with a certain type of outmoded reasoning that centres on what Eugene Thacker describes as 'the world-for-us'⁵². An apparatus through which quantified systematic ordering is attempted. Where constructed image, historic archival and evidential processes – three major considerations of contemporary photographic practice- are tacitly highlighted as insufficient strategies, on their own, to deal with the nature of algorithmic anomaly inherent in the raw processing of data.

Furthermore, reading photogrammetric images through a singular perspective or positionality – such as through computer science or the photographic –becomes limited and quixotic. The encounter of the raw computational form from any technologically determined preserving machine needs to be interpreted as subservient to the physicality and materiality of the environment itself. What Timothy Morton calls enmeshment,

where every entirety is interconnected and every entity encountered in the mesh looks unfamiliar, ‘They are strange, even intrinsically strange. Getting to know them makes them stranger. When we talk about life forms, we’re talking about strange strangers. The ecological thought imagines a multitude of entangled strange strangers’⁵³

Deterioration of material in Dick’s short story could be seen as a metaphor for our current understanding of the photographic in an expanded field. The entanglement of how the image making apparatus is framed and the phenomenological experience of what is being captured is problematic. The process of Labyrinths transmogrifications, through the preserving machine although more extreme in form are symbolic of this process because he utilises the idea of biological symbiosis, to manifest preservation as an assemblage of multiple agents. But it is evident from the creatures that are met in the environment, the ever-present threat of what Labyrinth calls the ruination of mankind, that the process of technological intervention creates new and emergent hybridized forms and organisms.

Making the familiar strange through repetition and doubling, the relation between the photographic as a mediation and the manner that the preserving machine acts becomes a further point of comparison. In Mark Fisher’s terms, the experience of the animals created by the process of the preserving machine are weird – rather than what Fisher calls ‘eerie’⁵⁴ or Freud ‘uncanny’⁵⁵ - in that the process of computation makes things present that are not expected to be. The environment hampers connectivity on a technological level, but not at a biological one where it plays an active agent in reconfiguring the human subject. Dick posits a change in our understanding of technological process becoming not a kind of evolution, but a refinement and

replication in an ever-smaller space, existing in potentially exhausted methodology and ideology and based on an ever-scarcer resources to create them. A radical change in thinking and culpability, which shows an awareness of our current ecological circumstance. We too are living in a transitional state which necessitates a change in perspective, and consideration of positionality of the human in this realm, as a matter of urgency. We know that catastrophe is imminent but the signs of this are denied, or there is still an expectation that technology will save us, though we are living in the future now. No place is transitional, no empty spaces exist outside of human influence on it. So, the necessity is not to develop ever more technical apparatus, but to understand better the assemblage in which the human is only part.

Conclusion

Dissatisfied with the results of preserving Labyrinth attempts to re-convert a bug transmogrified from a Bach Fugue back into sheet music. The fugue fragment when turned back into paper illicit only an expression of blankness from Labyrinth through analytic study. However, the consequence of the feedback loops makes the music, “distorted, diabolical, without sense or meaning, except, perhaps, an alien, disconcerting meaning that should never have been there.”⁵⁶ The machinic feedback loop affects Labyrinth to the extent that he despairs of the process which he dreamed to be the potential saviour of the society that he holds dear. However, the computationally synthesised sheet music which the preserving machine produces maintains their agency and their independence from this expectation.

Whilst the experience of the raw photogrammetric reproduction; an abstracted and imperfect artefact, is disappointing to the human consumer who desires a perfect replica of the world, these forms offer an important counter image to ideas of similitude associated with photographic forms of representation. These are rather the perfectly formed replication of computational parameters, the result of incomplete data capture through camera sensors and the partial alignment of images through software; operations that are all inherently flawed. Thus, the expectation of Labyrinth in Dick's short story disregards the agency of the machine as an operative agent in the complex visualisation of input data. Raw photogrammetric processes – completed through the algorithmic computational alignment of the point cloud are forceful in their wildly untamed iteration, equivalent to Labyrinth animal hybrids. These outputs are an embodiment of the problems inherent in the expectations of computational processes and a refusal of the rhetoric of the military-industrial complex that promotes perfected forms of similitude above any other knowledge claim.

¹ Philip K. Dick, *The Preserving Machine and other stories*, (London, Pan Books Ltd, 1972), 10.

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³ Philip K. Dick, 10

⁴ Philip K. Dick, 7

⁵ Jens Schröter, *3D: History, Theory and Aesthetics of the Transplane Image*, (London: Bloomsbury Academic, 2014), 33.

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- ¹³ Hito Steyerl, *Duty Free Art*, (London, Verso, 2017), 192.
- ¹⁴ Lorraine Daston and Peter Galison, *Objectivity*, (New Jersey, Princeton University Press, 2007), 131
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- ¹⁷ Lorraine Daston and Peter Galison, 139
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<https://www.youtube.com/watch?v=2DX2yVucz24>
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- ²⁹ Simondon, Malaspina, and Rogove, 17.
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- ³³ Wendy Hui Kyong Chun, *Programmed Visions (Software Studies): Software and Memory*, Reprint edition (Cambridge, Mass.: MIT Press, 2013), 17.
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- ³⁶ Chun, 17.
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