

A-Life: the creation and development of new modes of realism

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ABSTRACT This paper considers art and Artificial Life vis-à-vis the development and creation of new modes of realism. A brief sketch of the current conditions that underpin much in Artificial Life provides an alternative framework in which to consider Artificial Life screen-based artworks. Employing a 'media ecological' approach, the research explores the relationship between Artificial Life screen-based art and the broader digitally mediated landscape for the purpose of developing alternative modes of realism. These ideas are explored in the artwork *Laboratories of thought and experimentations for future forms of subjectivation*. Examining the representational codes and conventions associated with perspective and three-dimensional digital space the artwork provides a foundation and lens through which to further explore representational codes and conventions in Artificial Life.

KEYWORDS Artificial Life, media art, realism, media ecology

INTRODUCTION

The natural world and all forms of human activity have been systematically and creatively modeled in conceptual form since antiquity. A short and by no means exhaustive list of authors investigating conceptual modeling, mainly within the arts, include (Alpers 1983; Mayr 1986; Deleuze, Guattari and Massumi 1987; Crary 1992; Elkins 1994; Foucault 1994; Virilio 1994; Holland 1998; Kittler 1999; Golley and Keller 2000; Yates 2000; Fuller 2005; De Landa 2006). These authors trace out complex arrays of composite schemas through which to understand the conceptual models of the world. These schemas of perception invite various readings of the models.

One reasonably nascent field to systematically develop models of the natural world and the human endeavor is artificial life (A-Life).¹ Informed by principles advanced in ecological sciences and cybernetics, scientists in the field attempt to computationally model the natural world, biological systems, ecosystems and attempt to not simply synthesize life as we know it but moreover to create life as it could be (Langton 1989). A-Life describes a specific area of research investigating the principles that constitute a living system without making reference to the materials that constitute it (Adami 1998) as well as the study of the general properties of "cognitive and intelligent abilities" (Risan 1997). For many researchers the capacity for the computational system to evolve is paramount to A-Life; this view is best summed up by A-Life researcher Thomas Ray who states it would consider a system to be living if it is self-replicating, and capable of open-ended evolution (Ray 1991). It has also been observed that the present challenges of A-Life include the transition to life, the evolutionary potential of life, and the relation between life and mind and culture (Bedau, McCaskill, Packard et al. 2000).

Of interest to this paper is the permeation of A-Life, including the scientific theoretical models of the world and the associated biological metaphorical representations that describe A-Life, into the broader cultural domain, in particular the arts. In *How we became post-human* (1999) N. Katherine Hayles proposes that A-Life (as an epistemological enterprise) is instrumental in creating the necessary conditions for our western modern society to develop into a post-human one (Hayles 1999). Hayles contends that narratives about and within the domain of artificial life constitute a multilayered system of metaphoric and material relays through which life, nature, and the human are being redefined (Hayles 1999) furthermore in the AL paradigm, the machine becomes the model for understanding the human (Hayles 1999). Critical to Hayles discussion are the creative capacities² required to engage and interact with A-Life including the associated metaphors, models and techniques. Computer scientists, engineers and physicists working in the field of A-Life often develop these capacities and the associated biological metaphors to describe A-Life processes and techniques; that is the metaphors and strategies used to express A-Life are filtered through the domain of science (Helmreich 1998; Hayles 1999; Kay 2000; Barker 2006; Barker 2007; Johnston 2008).³

To fully appreciate the significance of this cultural shift we can examine other 'naturalized' technologies

and associated capacities that radically reshaped western civilization. Whilst there is no scope to provide a detailed examination in this paper, a brief example will serve the purpose. In discussing the history of writing German philosopher Friedrich Kittler reminds us writing functioned as a universal medium in times when there was no concept of medium. Whatever else was going on dropped through the filter of letters or ideograms (Kittler 1999). Illustrating the point Kittler quotes from Goethe 'Literature is a fragment of fragments; only the smallest proportion of what took place and what was said was written down while only the smallest proportion of what was written down has survived' (Kittler 1999). Kittler's argument is 'media define what really is' (Kittler 1999). Such as it is, the following question is framed in relation to A-Life as a new mode of realism: what new 'reality' does A-Life, as a series of computational media competencies, define? Inversely we can also reframe Kittler's remark into a contemporary one: whatever else is going on gets dropped through the filter of computational systems, cybernetic and ecosystemic processes and algorithms; and through the domain in which these processes and algorithms are predominantly formed, the sciences. 4 Hayles contends that the aforementioned metaphoric and material relays have a symbiotic relationship with and to the broader cultural domain; these relays feed into and are fed by the cultural imagination (Hayles 1999): none-so-more than artists investigating A-Life and the processes of computational evolution.

A-Life Art and modes of realism

Screen based A-Life artworks vary greatly in their enquiry (see Whitelaw 2004). However, the transmission of strategies from A-Life, as defined by normative scientific practices, into screen based A-Life artworks themselves is evident. A survey of A-Life screen based artworks created during the last 20 years underscores the success in which 19-20th century scientific strategies underpin, maintain and restrict alternative models of A-Life via the valorization of both 1. biological metaphors to describe A-Life and 2. observation and the objectification of life (see Johnston 2008; Guglielmetti 2009). Hayles (1999) and Kay (2000) examine the development of the biological metaphor within science during the 20th century and chart in considerable detail the conflation of biological specificity into the domains of cybernetics, systems theory and information theory. As such, this paper will focus on the observational status of A-Life screen based art.

The scientific *raison d'être* (observation) in A-Life screen based art is de facto with few exceptions deviating from this norm. In other words, the observational model integrates as a standard protocol in A-Life and A-Life art. 5 In summary, the computational processes used in a typical A-Life screen based artwork 'involve' the 'genotype' (code) and 'phenotype' (form) of the A-Life world. In general, these processes have not extended into 'evolving' the view into the world. The window that frames the A-Life artwork evokes the static nineteenth-twentieth century 'scientific' study rather than suggestive of the media saturated twenty-first century landscape. To a large degree, this orthodoxy defines A-Life screen based art as it should be and not what A-Life is; a series of computational media processes. 6

The observational model that frames the lens into the A-Life world is not so much problematic as it is incongruous with much in A-Life research as the entire parameter space of the A-Life world is up for grabs. That is, researchers in the field develop the capacities required to evolve the entire parameter space of the computational system, including the virtual camera into the A-Life world. 7

What is striking is that limited research exists within the A-Life arts community that explores the 'open window' (the mathematical rationalization of pictorial space) or techniques used in cinema as potentially dynamic systems within two-dimensional or three-dimensional computational space. The lack of experimentation with the virtual camera in A-Life is significant given the dominance of montage, cinema, television and video (including their respective discourses) in the twentieth and early twenty-first centuries especially in terms of the suspension of disbelief, authorship and in relation to the formation of subjectivity and cultural identity. 9

One approach in which to examine A-Life screen based artworks re-centers A-Life screen based art as constituent of a twenty-first century media saturated environment in which screen based culture transforms both the capacities for communicating and in the formation of subjective experience.

MEDIA ECOLOGY

Re-positioning A-Life art as constituent of a media saturated landscape is reminiscent of Matthew Fuller's media ecology (Fuller 2005).¹⁰ Media ecology according to Fuller is the relationship between information, materiality and the dynamic interrelation of processes and objects, beings and things, patterns and matter (2005). In other words [a] media ecology is a cascade of parasites (2005). Fuller argues that media innovation surfaces when the collision of two or more standard yet disparate processes interact casting, as it does, the media system into cultural relief (2005). In light of this Fuller asks [w]hat arises when two or more standard processes, with their own regimes, codes, modes of use and deportment, systems of transduction, and so on, become conjoined? (2005). Drawing on Deleuze and Guattari's machinic phylum, Fuller argues that all media and media systems are caught up in a complex socio-political, technical, material web. These elements, when they come together create something greater than the individual sum of its parts. For example when discussing 'Jungle' music and pirate radio: "Fuller states that pirate radio is not a whole system but an aggregate of illegal, unlicensed broadcast signals that are created by spectrum poachers on regulated bandwidths, where the airwaves carrying voices of dissent in society collide with agendas, media, laws, and marketing. Voices that walk the margins in pirate radio are expressing a will to power through technology." (Moberg 2006) The totality of these elements produce an underground mobile music scene, a scene not readily evident by simply listing the elements, a scene that reproduces itself with every attempt to close it down or regulate it.

If we consider Fuller's observation regarding media ecology at face value a number of questions surface; what transpires by merging A-Life with other standard processes, codes of representation, 'patterns and matter' external to a scientific discursive framework (for example cinema)? How might a social entity¹¹ engage with, and in, such a system? These two questions attempt to re-center A-Life into a framework outside of its original 'user specific' domain, one that reflects on A-Life as a constituent of a media form (Manovich 2001). Reconceptualising A-Life as a media form provides the opportunity to divest it of the discursive framework and rhetorical strategies of the sciences by investing it with strategies from a broader media landscape.

As discussed, the lynch pin in an A-Life/cinema media ecological 'mashup' is the virtual lens. To describe the potential outcome of this marriage is difficult but the following descriptions, with the obvious caveats, come to mind; 'evolving' a movie and 'growing' a documentary. These phrases whilst evocative are both inadequate to describe the broad concept: to both recalibrate A-Life screen based art with a new visual grammar and to 'expand the grammar of film itself [by] creating a new visual syntax, new ways of morphing from scene to scene [and for creating] new logics for transitions between shots [and] new visual/thematic analogies'.¹² The artwork Laboratories of thought and experimentation for future forms of subjectivation (2007) was created to test both the visual language such an mashup might render in addition to exploring the complete transfer of one naturalized technique, in this case perspective, into a computational media framework. Whilst the project does not investigate or utilize A-Life processes per se, it explores the limitations and potential for exploring 'media ecology' in computational image making, one useful in exploring the virtual lens and A-Life screen based artworks.

PERSPECTIVE: THE EVERYDAY STATUS QUO

Artwork Description

Laboratories of thought and experimentation for future forms of subjectivation is a site-specific digital installation exploring the subjective experience of the world by exploring one conventional model of the world, perspective (both the mapping of reality from one's 'point of view' and as an image making technique) and computational data structure, to generate an alternative mode of realism.

A three-dimensional digital representation of an arts gallery, called the Trocadero Artspace, was created in 3D software. A photographic survey of the site was undertaken and the digitized images were mapped to the three-dimensional model of the Artspace. The three-dimensional model was exported into a 3D games engine for users to navigate through. At a basic level the experience is similar to a playing 3D computer game, for example; the user employs a mouse or keyboard to navigate the user's point of view through

the three-dimensional model; and the three-dimensional architectural attributes are mapped to real world physics, such as gravity, walls are solid, open doorways can be walked through etc.

The artwork, however, exploits formal techniques used in three-dimensional computer graphics to reorganise the conventional rendering of the three-dimensional model. The project massages the computational data structure to reorder the visual field via a real, rather than virtual, point of view. Elements in the three-dimensional model are numerically ranked according to their emotional relevance to the artist and important elements are rendered in front of less important ones. The artist's favoured spot, his partner's studio, is potentially visible from anywhere in the scene. While the spatial integrity of the Trocadero Artspace is maintained for the purpose of user navigation, the subjective re-rendering of the scene disrupts its representation of space, creating an abstract, navigable three-dimensional collage (Whitelaw, Guglielmetti and Innocent 2009).¹³

Brief technical overview

A 3D games engine is used in the project because it is designed to mathematically render perspectival space accurately. The three-dimensional model's axis of depth, called the z-buffer, is used to reorganise the drawing logic of the scene. The z-buffer determines which elements are visible to the virtual camera, and which elements occlude other elements; in other words the z-buffer is a data structure that establishes the logical order in which elements are to be drawn in a scene (generally speaking the foreground is normally drawn in front of the background). The stacking order, or placement within the z-buffer, is determined by the scene's geometry: elements far from the camera are drawn earlier, and are occluded by nearer elements, drawn later in the sequence. The z-buffer is linked to the virtual camera. This connection between elements in the formal ontology of 3D graphics affords a familiar, realistic depiction of virtual space (Figure 2). Unpinned from conventional geometric formation the z-buffer is reconfigured along subjective lines. This reveals the z-buffer as a data structure - part of a computational ontology - rather than some naturalized spatial order (Whitelaw, Guglielmetti et al. 2009). The project explores the tensions inherent in the rationalization of pictorial space as a model through which to filter subjectively mediated perceptual experience of the physical environment (Guglielmetti 2009) or put simply as a new means to understand the world (Kluszczyński 2003).¹⁴

CONCLUSION Perspectival formalism is specifically examined in *Laboratories of thought* because perspective as a technique or system codifies the visual field by foregrounding the connection between representational systems and the technologies that are used to generate these systems¹⁵ (Hoy 2005). The project examines the ways in which perspective as a representational code or algorithm has come to shape what we see as realistic or true to life (Hoy 2005). In *Laboratories of thought* the techniques used to render a dominant model of subjectivity (first person perspective) are remapped to a model in which the objects and elements in the world are numerically graded then rendered according to subjective emotional criteria (Whitelaw, Guglielmetti et al. 2009).

According to James Elkins, perspective, both as a series of creative experiments and as a conceptual model that gives rise to and shapes our point of view (Elkins 1994)¹⁶, has a complex genealogy culminating in the creation of modern perspective as an artifact of the Enlightenment (Elkins 1994).¹⁷ Similarly, whilst scientist Colin Martindale clearly demonstrates observation is science's *raison d'être* (Martindale 1990), Crary reminds us the formation of modern observation developed from various historical processes and cultural activities (Crary 1992).¹⁸ Assuming Elkins and Crary are both correct in that point of view and observation (respectively) are both modern artifices that shape our knowledge of the world, A-Life, as a series of processes and competencies, is an artifice that shapes our knowledge and experience of the post-human environment.

In mapping the historical trajectories of vision French philosopher Paul Virilio identifies artificial vision, that is the automation of perception via computational processes (Virilio 1989; Virilio 1994), as a new challenge for contemporary society.¹⁹ Anticipating A-Life and motivated by developments in neural networks, specifically the perceptron model²⁰, Virilio states: Once we are definitively removed from the realm of direct or indirect observation of synthetic images created by the machine for the machine

instrumental virtual images will be for us the equivalent of what a foreigner's mental pictures already represent: an enigma (Virilio 1994). The potential significance of Virilio's enigma and the broader question of A-Life as life as it could be are refined in (Johnston 2008). Johnston proposes that the question, what is life? is perhaps more central to A-Life than it is to biology. A-Life gives itself a double objective: to advance scientific understanding of the mechanisms and logic of life regardless of medium and to bring into existence new forms of nonorganic life. If A-Life is a form of nonorganic life, these 'life forms' require an entire array of creative capacities to communicate with humans (more so if this communication becomes an everyday experience). The dominance of the 'moving image' within western culture during the past century, including the capacities required to decode the moving image, has been instrumental in the formation of modern and post-human subjectivity. The challenges for researchers in the field of A-Life include adopting a range of strategies foreign to A-Life without jettisoning the principles that underpin it. In employing techniques such as montage the challenge is not to simply synthesize 'cinema as we know it' but to create 'artificial vision as it could be'; to evolve the virtual camera from an artificial 'life forms' point of view.

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NOTES

1 The term 'artificial life' was coined by Chris Langton in 1986 (Langton 1986). 2 A capacity is characterized by what a social entity is capable of doing when they interact with other social entities. (De Landa 2006) 3 I am reminded of an essay by Hakim Bey in which he muses on the missives on the back cover of the zine 'NO' part of which exclaim 'WHOEVER CONTROLS THE METAPHOR GOVERNS THE MIND' (Bey 1998). 4 This requires further unpacking; Helmreich argues that a range of subjectively experienced (privileged) activities make it possible for scientists to undertake their research. These activities include access to adequate healthcare, economic stability, education, social status etc to, with and from within an institutionalized framework that informs both the capacity to undertake objective analysis in addition to the way scientists view the subject matter they seek to objectify (Helmreich 1998). 5 I don't want to appear disingenuous here; most artists working in the field have other research interests and simply might not be interested in the correlation between cinema and A-Life. There are notable exceptions for example research at MIT's 'Interactive Cinema' is related however the key themes of the MIT research investigate the sampling of information from the outside world via video, gestural controllers and microphones for improvised real-time performance (Nemirovsky and Watson 2003) (Nemirovsky 2003) and as a story generating system (Davenport, Barry, Kelliher et al. 2004). I am interested in evolving the virtual lens from an artificial life's 'point of view' not as a planning tool. 6 DeLanda makes a similar observation regarding 'artificial intelligence' and its relationship to 'older paradigms of what a symbol-manipulating 'mind' should be' (DeLanda 1998). 7 This incongruity is perhaps not surprising given that the conceptual insights and conceptual limitations within A-Life research filter through the lens of the 'hard sciences'; evolving the virtual camera would disrupt the observational nature of the work. 8 In making reference to Alberti's formalization of perspective in *Della Pittura* (1435) I seek to make the connection between one 'new realism' (White 1972) with a new contemporary realism. 9 Given the clear relationship between A-Life visualisation, screen based culture and the moving image it is ironic that the 'traditional' arts are often evoked in A-Life art, including drawing, painting, music and sculpture, yet montage (cinema and video) is excluded from most A-Life screen based art works. 10 A-Life already employs a media ecological approach; a collision between computation, biology and animation. My approach extends the ecological framework to include a diverse range of institutionalized socio-political activities. 11 The term social entity is used to describe a participant or 'user' involved in such an activity. 12 In private correspondence with visual media theorist Drew Perry. 13 Usability studies have not been conducted on the project. 14 The project has resonance with other artworks for example see the works by Tamás Waliczky. 15 For an introduction into perspective in art see (White 1972; Gombrich 1982; Panofsky 1991; Crary 1992; Elkins 1994; Elkins 1996; Crary 1999; Gombrich 2002). 16 I draw on (Foucault 1991; Crary 1992; Elkins 1994; Foucault 1994) for a description of perspective as a cultural invention, albeit I am persuaded by Pinker's

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argument regarding the role of cognitive function in the formation of enaturalí vision (Pinker 1997). 17 As in most creative endeavors modern perspective was not predetermined from its inception in the early renaissance. The developmental process of perspective has much in common with Csikszentmihalyi's variation, selection and transmission process (Csikszentmihalyi 1999). 18 This is a view supported by Helmreich's anthropological study of A-Life researches in the Sante Fe Institute one of the key institutes researching A-Life in the US. (Helmreich 1998) 19 Machine vision is a concern also raised by Guattari who is convinced that the question of subjective enunciation will pose itself ever more forcefully as machines producing signs, images, syntax and artificial intelligence continue to develop. (Guattari 2000) 20 Frank Rosenblatt developed the perceptron in 1957. For a reasonably accessible description of the model see (Davaló and Naim 1991).

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