Strange Ontologies in Digital Culture

Mitchell Whitelaw
Faculty of Design &
Creative Practice
University of Canberra, Australia
Mitchell.Whitelaw@canberra.edu.au

Mark Guglielmetti
Centre for Electronic Media Art
Monash University, Victoria, Australia
mark@metraform.com

Troy Innocent
Centre for Electronic Media Art
Monash University, Victoria, Australia
Troy.Innocent@ArtDes.monash.edu.au

Abstract

The concept of a 'strange ontology' is articulated via the intersection of philosophical and computational definitions of ontology. Within digital media, each simulated world requires both; an ontology, to define its existence as data; and a subject, the player or user, who engages with the simulation. Glitches or interventions in these simulations create ontologies that are inconsistent with our lived experience, rendering them 'strange'. We draw upon a range of works to illustrate this concept including game art, social networking software, Guglielmetti's 'Laboratories of thought' and generative art. The paper aims to define this concept and outlines a terrain for further investigation.

1. Introduction

Digital systems offer opportunities to formulate and develop new methodologies in the structuring of human experience. The authors propose that these systems are shaped primarily by their formal structures and relations; their ontologies. Moreover as these systems are interactive, their ontologies inform modalities of subjectivity in relation to a player or user. The articulation of this concept draws upon fields such as gaming, generative art, new media art and post-cinema. To illustrate the concept we provide examples of alternative, novel ontologies. This research is in an early stage of development and so this paper maps a terrain that defines what is meant by a strange ontology and suggests areas of further investigation.

2. Philosophical and Computational Ontologies

In proposing the concept of strange ontologies we draw on two distinct but related usages of the term ontology. In philosophy, ontology is the study of being; it refers to thought about "what is." It addresses the concepts we use to think of the world, typically in the form of entities and their relations. In the "information sciences" - especially

artificial intelligence and knowledge management - ontology refers to a formal representation of knowledge. It is a practical project seeking out the representational elements necessary to "model a domain of knowledge or discourse" [Gruber 2007]. The products of this field - ontologies - are concrete, explicitly defined sets of entities, attributes and relations that can be readily represented in computational systems.

One common application for these formal ontologies or models is in the design of databases - formal arrays whose task is to effectively represent elements of the world for certain purposes. In these cases the questions of which entities are represented, which attributes are encoded, and the possible relations between entities, are informed by a "data model." These models are "domain ontologies"; they are functionally linked to, and limited to, a particular context. For example a database of real estate sales will describe certain entities and events (sales, properties) with certain attributes (prices, dates, addresses) but ignore other aspects of the events it encodes. Some approaches to artificial intelligence seek all-encompassing "upper ontologies": formal structures that attempt to encode knowledge in the broadest possible context. The best known example here is the Cyc project, which aims to develop an expert system with a vast body of general knowledge about the world (see http://www.cyc.com).

The relation between these two ontologies is striking. At one level it is a difference in functional orientation. For philosophy, ontology is a reflective process, an ongoing questioning of how to think about "what is". For the information sciences, ontology is applied, contextual and specific; its question is how best to model what is, for some computational system in some specific domain with some specific purposes. With that practical imperative, the open, reflective position of philosophy is impossible to sustain. An answer is required. If philosophical ontology asks, "what is?", computational ontology answers: "this is" - or at least, "for our purposes, in this context, for this system, this is."

Computational ontologies are functional, instrumental; they make information systems work. But they are never transparent or neutral; just as they constitute the core elements of a computational system, they define and delimit the range of potential of that system in action. Each specific ontology, in a sense, defines an entire world. Here computational ontologies become more interesting, as objects of study, than their philosophical counterparts. Computational ontologies are real, active, functioning systems; their implications are actual, rather than hypothetical; they are domains of interaction and experience. Their significance for us is that they implement the abstract relations of philosophical ontologies; computational ontologies literally realise those relations. We will argue that these ontological structures play an important role in the aesthetics and experiences of new media forms, and for this reason we need to develop a critique of these ontologies. In most cases, the computational ontologies of new media reflect a narrow set of cultural and philosophical conventions; and the resulting systems play out, or even intensify, those conventions. This need not be the case, as demonstrated by some of the examples discussed here. Within their inherent limits, formal ontologies can implement innumerable different schemas of entities, attributes and relations. Alternatives to conventional ontological structures - what we will call strange ontologies - offer creative and critical promise.

3. Subjectivity and Agency

The self, subject, agent or entity is one of the most ubiquitous and significant ontological constructs. The role of ontologies in "social software" illustrates this and begins to show

how formal ontologies can both intensify and transform our habitual models of being and relation. Social networking applications such as Facebook encode the individual, or user, within a formal ontology, as an entity with a specific set of attributes and possible relations. Real, complex social relations between individuals are also represented formally, most often through the single category of "friend". We can easily critique this as a poor representation, and it is, though this is not our main interest. We do not expect formal ontologies to provide complete representations of their domains (on this topic see for example Shirky (2004)); more interesting is to ask what this ontological structure does, how it plays out within the system. The flattening of social relations into a single, symmetrical, binary relation, and the representation of these "friends" as elements in a list, shapes the use of these systems in powerful ways, and of course influences the social domain that they seek to represent.

Social software also demonstrates alternative ontological structures, and hints at their implications. In the social bookmarking service del.ico.us, users are represented in overtly conventional terms, but within an ontology that allows for more complex, and open, implications. Instead of the symmetrical "friend" relation, inter-user relations are defined through an asymmetrical "fan" relation. One user can become a "fan" of another, adding them to a "network" list; but this relation is not automatically reciprocated. This results in more complex relations of connection and differentiation between users. The ontology of tagging, or folksonomy, is also notable here; tags show how a simple, well-defined formal ontology can remain open to a wide range of uses. Tags create lateral structures that cut across the user-base of the system, filtering and grouping its contents; tags can facilitate intentional or un-intentional connections between users. Although it draws on certain cultural conventions (for example the keyword), the tag is a formal entity that is relatively uncoupled from familiar ontological structures. A tag is like a label or word, but also in part a command, a search query and a form of social discourse; it is all and none of these things. The emergent phenomenon of its use begins to illustrate the potential of such entities.

Subjectivity and agency as structural and philosophical (or socially constructed) ontologies are also a focus for Mark Guglielmetti. Guglielmetti's art installation *Laboratories of thought and experimentation for future forms of subjectivation* (2007) explores the ontology of perspective both as techne (method) and as a series of complex metaphoric models through which we subjectively conceptualise the world. The installation is a site-specific artwork for which the artist constructed an accurate three-dimensional digital representation of the gallery the installation was exhibited in, including the surrounding artists' studios (called the Trocadero Artspace). This three-dimensional model was exported into a games engine for users to navigate through.

The project exploits formal techniques from 3d graphics to reconfigure the conventional rendering of the three-dimensional model. Guglielmetti reorganises the scene's axis of depth, or z-buffer. The z-buffer is a data structure that determines the stacking order of objects in a scene, determining which are visible to the virtual camera, and which objects occlude other objects. In general the stacking order, or placement within the z-buffer, is determined by the scene's geometry: objects far from the camera are drawn earlier, and are occluded by nearer objects, drawn later in the sequence. The z-buffer is linked to the z-axis of the virtual camera. This connection between elements in the formal ontology of 3d graphics creates a familiar and "realistic" depiction of virtual space, but as the artist shows here, it is far from necessary. In *Laboratories of thought* Guglielmetti remaps the z-buffer, unpinning it from geometry and reconfiguring it along subjective lines. This reveals the z-buffer as a data structure - part of a computational ontology - rather than some natural spatial order. The work then uses that computational

structure to reorganise the visual field through a real, rather than a virtual, point of view. Guglielmetti ranks elements in the model according to their emotional valency; favoured parts of the Trocadero are rendered in front of less favoured ones, and the artist's favourite spot (his partner's studio) is visible from anywhere in the scene. While the spatial integrity of the 3d model is maintained for the purpose of user navigation, the subjective re-rendering of the scene punctures and disrupts its representation of space, creating an abstract, navigable three-dimensional collage.

The installation doesn't seek to deconstruct perspectively rendered space per se; rather *Laboratories of thought* investigates the significant characteristics that involve the construction of subjectivity in a cybernetic post-human society [Hayles 1999]. Perspective as a "system" codifies the visual field by foregrounding the connection "between representational systems and the technologies that are used to generate these systems" [Hoy 2004]. *Laboratories of thought* interrogates the ways in which perspective as a ""representational "code" or algorithm comes to shape what we see as "realistic" or "true to life."" [Hoy 2004]. In the case of *Laboratories of thought* the formal 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.

Image 1: POV shot of the gallery in *Laboratories of thought*. The z-buffer is mapped to 'normal' perspectival logic.

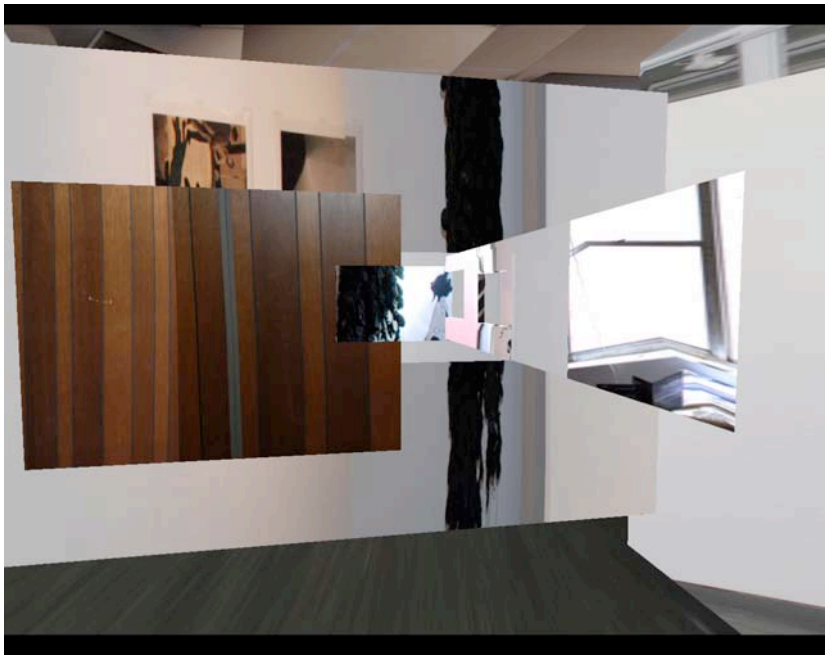

Image 2: Same POV shot of the gallery with the z-buffer re-mapped to the artists' emotional relationship with the Trocadero ArtSpace.

4. Games

An area of interest for the authors is in the design and architecture of computer games. Lev Manovich describes computer games as spatially navigable databases [Manovich 2001] and in this sense they make visible the contents of the database through a variety of means. Devices such as inventories, maps and the interface itself may be read simultaneously within the game space or be accessed separately through menus. All these elements serve to make the contents of the database visible and tangible to the player so that the system may be easily understood. Learning how to be within a game space means learning what exists within that space and what can happen there. Players build their own ontological view of the space as they decode it through play or usage.

From the developer's perspective, designing the ontologies that underpin games is a formal act of 'world design'. By necessity, in developing an artificial world, elements of the real world must be left out, simplified and abstracted. In subtler, perhaps even more subversive ways conventional computer games create stranger ontologies by the very fact that these games, and their formal modellings are accepted as conventional standards in which to both represent the world and the experiences to be had in the 'real' world. Games that try to simulate a 'real world' experience can been seen as 'stranger' as any intervention into their realism (for reasons of playability, available hardware resources and so on) is more likely to stand out than in an artificial world. These artificial worlds are built to be different and come packaged with the premise of having their own rules or take on reality. Abstracting a real world experience into a formal game system that fits the constraints of a computational ontology entails capturing some essential aspects or perhaps essence of the 'experiential domain' in question - whether it be car racing, karate, building a city or flying a tiny spacecraft through fields of abstract field of computer graphics - then compressing a model of this experience into a complex formal structure. The glitches in the resulting output in the

form of game physics, the serial repetition of game art and sound, level design – the art of building space for the purpose of play, compromises in graphical representation are all potential reality-changing elements that result in, to varying degrees, slightly odd or surreal experiences.

An obvious example is the nature and purpose of death in games, particularly First-Person Shooters (FPS). Permanent player death in a game is impractical and frustrates the player's enjoyment of the experience. For example, if a player died in game play and was required to start over from the beginning then the game becomes unplayable, however this would be more consistent with how we understand death from our experience of the real world. As an aside, a more extreme example would render the game playable only once until the player died. Online character deletion is somewhat like this. A player may develop a character over months, perhaps years, of online play - once deleted that work is lost. Personal video documentation of this deletion process posted online has the character and quality of a somber ritual. However this is an exception not the rule, death is not permanent in games; in fact it can have a practical function in marking the stage at which mastery of the game has not yet been attained by the player. They will continue to repeat the same set of actions leading up to their death again and again to complete a level or stage at which their progress can be saved and they move onto the next challenge. This unreality is accepted because it is part of the game.

The strangeness of death in simulated worlds is a recurring theme in game art. These works typically involve modifications within existing games that highlight the unusual nature of game death through a simple intervention or tweak of the rules. Brody Condon's Half-Life level entitled *Adam Killer'* (2001) (http://www.tmpspace.com/ak_1.html) consists of multiple clones of his friend within a minimal, un-textured white game level. The player is presented with a shotgun and multiple 'Adams' standing idle. There is little else to do but 'kill' them all, leaving beautiful trails of blood spatter on the pristine white game level. This makes their death an aesthetic act rather than a ‘real’ death – there are always more to kill. Another example of the subversion of game death is the *Kill Yourself Game* (2005) (http://beepkeeper.com/rebecca/?2005:KillYourself) by Rebecca Cannon. In this game you effectively play against yourself as you spend the entire game killing copies of your own self within the game world. How long you spend doing this is tweaked in response to your level of self-hatred.

As in social software, the user or player of the game is the central construction. In its conventional form the player replicates a whole set of conventions of subjectivity that are both familiar and formally convenient. Of course this need not be the case; computer games likewise offer clear potential for deviation from these ontological templates. Julian Oliver's *Second Person Shooter* (2005) is a two-player combat game which in most respects follows the conventions of the genre: Cartesian perspective, static environment, anthropomorphic over-the-shoulder representation. Oliver simply exchanges the points of view of the two players. My point of view, is through the eyes of my opponent; and her point of view is through me. Moving in the world becomes a challenge: I can only see where I am if my opponent is looking at me; and of course vice-versa. In plans for a multi-player version Oliver (2007) imagines an ontology-manipulating weapon: the "POV grenade" would randomly re-assign points of view within the player group. These ontological structures radically alter experience, and have rich implications, yet they are based on minimal changes to a conventional schema. The entities here are familiar; the single change is to re-wire one (spatial) relation between entities - the player's representation and POV. *Second Person Shooter* reveals this relation as conventional,

rather than necessary; the project implicitly questions the necessity of other relations - or entities - and the implications of possible alternatives.

Image 3: *Second Person Shooter*. The player observes their character through the opponent's POV.

Valve Corporation's *Portal* (2007) is another example of a minimally altered ontology with rich implications. The game adds a single entity - the Portal - to an otherwise conventional first-person-shooter. A Portal is a "wormhole" connecting any two points in the world. The portals are generated by the player using a 'Portal gun'. A Portal system can be placed on almost any two surfaces to construct a visual and physical connection from one Portal to the other portal. The game play consists of a series of puzzles that lead the player through the implications of this device, as it interacts with (and literally cuts through) the conventional elements in the game's simulated world. The device exaggerates elements such as direction, distance, gravity and force by explicitly rendering them completely irrelevant or absolutely critical in game play; the Portal creates sharp (inter) spatial discontinuities in the game's simulated space. Philosophically the game explores similar ontological terrain to *Second Person Shooter*, in that certain conditions in game play merge, or at least converge, the relationship between subjectivity with objectivity allowing the player to observe their character through the Portal system. This visual paradox elicits a strange effect, a premonition of action. It brings to mind the statement made by French philosopher Paul Virilio "the act of seeing is an act that proceeds action" [Virilio 1995] and provides a nice twist to Virilio's "splitting of the viewpoint, the sharing of perception of the environment between the animate (the living subject), and the inanimate (the object, the seeing machine)" [Virilio 1995]. This subjective/objective paradox advances the advent of Virilio's 'vision machine'; the complete removal of "direct or indirect [human] observation of synthetic images created by the machine for the machine" [Virilio 1995].

Image 4: POV shot looking into two portals placed into a corner. The character in shot is the player's character Chell.

Image 5: The paradox of *Portal*; the player can see their character Chell in both portals whilst the Chell characters observe the player, Chell.

Certain games also offer instructive examples of how action within formal ontologies can reconfigure and adapt them, even without transforming the underlying formal structure. The phenomenon of "corpse graffiti" emerged in World of Warcraft

when players discovered that they could choose to leave a character's dead body behind in the world - the virtual corpse becomes a way of manipulating an otherwise impervious environment, and sending messages to others in the world. Messages are carried through combinations of the corpse names and spatial position (for example four dead orcs arranged at the entrance to a building could spell out "please" "wipe" "your" "feet"); in one extreme example of corpse graffiti as advertising, gnome corpses rained from the sky to spell out a website address (using spatial position alone). In WoW the corpse is a formal entity with a set of explicit attributes (such as name, location); the entity "models" a set of basic assumptions about the role of the corpse in the game world. Yet this entity can be readily diverted; there's a kind of loophole or slippage in the assumed or intended outcomes of the ontology; alternatives are discovered. In particular the structure of the entity offers some toeholds, some open spaces or fields for a kind of lateral function that enables the corpse to be "taken as" something other. In this case those attributes are a text string - the character name - and spatial location; name becomes text becomes discourse (joke, ad); spatial location opens up a field of possible relations with other elements in the environment (including other corpses).

5. Generative Art

Formal systems and ontologies are central to the practice of digital generative art. While attention has tended to focus on the rich visual surfaces of generative art, Whitelaw (2005) has argued previously that the underlying model, or ontology, is a more promising focus for critique. Like games and social software, generative art systems create and visualise dynamic structures of entities and relations; and even though generative art is unrestrained by the functional demands of social software, or the representational conventions of gaming, its formal structures also tend to draw on and reproduce familiar ontological conventions. However the open-ended aesthetics of generative art do offer striking counterexamples to this tendency, visualising alternative modes of being and relation.

In Jonathan McCabe's generative works complex abstract computational structures generate dense, digital-psychedelic surfaces. In his *Origami Butterfly* series, McCabe's formal system is elementary but, in our argument, powerfully strange. In part it can be explained through a simple material metaphor that will be familiar to any pastry chef. A flat surface is folded along a random axis, then stretched back to its original size, and folded again; this is repeated some thirty times. Imagine then marking a point on this surface before the folding begins, and tracking the progress of the marked point with each fold. The result would be a list of coordinates corresponding to that point's trajectory through the folds. This list describes the sequence of transformations of that point in space. It is a geometric record of the local implications of a cumulative sequence of global transformations. McCabe uses this coordinate list, or transformational sequence, to generate colour values for each pixel in the *Origami Butterfly* images. Each pixel's colour visualises its unique trajectory through the folds.

Image 6: Jonathan McCabe, image from *The Origami Butterfly Method*.

The resulting images suggest mutant kaleidoscopes or strange aerial landscapes; they often have a strongly material quality, which is slightly ironic because their generative ontology is entirely abstract, immaterial; it is a smooth structure of spatial relations, rather than a population of entities or objects. Often, generative artworks use swarm-like ontological models: masses of discrete, identical objects, visualised as a literal multiplicity. By contrast McCabe's system demonstrates what might be called a relational ontology; it visualises the differentiated and integral relations of space with itself through a cascade of geometric transformations. This model is more abstract - and harder to grasp - than the ubiquitous generative swarm, but we suggest far richer in its aesthetic and conceptual implications.

6. Strange Ontologies?

Correlations across the examples presented here allow us to add some detail to the (as yet vaguely defined) notion of strange ontologies. This is vital for unless we are content to value "strangeness" for its own sake we need a better sense of the relation between these structures and their more conventional counterparts. In several instances here, a representational, data-model style ontology is altered with a single change - a tweak, crack or mutation. In *Second Person Shooter* two corresponding elements in the ontology (POVs) are simply transposed. The difference between the social graphs of del.icio.us and Facebook is a single attribute: relational symmetry. Guglielmetti's *Laboratory of thought* and Valve's *Portal* each hack or puncture their ontologies at a single point. In other words, what we describe here as strange ontologies are often very similar to conventional models. These examples also show how a single tweak in these formal structures can transform their internal dynamics and generative outcomes.

Another strong correlation is in the character of the ontologies themselves. Perhaps the most profound implication of conventional formal ontologies is what might be called objectiveness. Being here has a sense of absolute identity: what is, is. The

data model approach to ontologies is founded on global and absolute order and meaning. In some of the examples here, by comparison, data entities engage in more complex, relative and asymmetrical relations. Facebook and del.icio.us illustrate this simply; in the first, a friend is (absolutely) a friend; in the second, this is not the case. McCabe's *Butterfly Origami* system is a more complex investigation of such a relational structure. In *E-volver*, a generative art system by Dutch artists Driessens and Verstappen, these relative links operate between agents and the image plane that forms their environment. Agents behaviours are determined by the colours of their neighbouring pixels, but each agent operates under a different set of rules; as a result the environment is "taken as" something different for each agent, and the rich outcomes of the system emerge from a connective patchwork of diverse local interactions, rather than a uniform, global order of being (for further discussion see Whitelaw 2005). Similarly in *Second Person Shooter* the ontological transposition of viewpoints creates a simple but profound relational entanglement between players; and in *Portal* the spatial wormhole has the function of transforming the physical relations of game space with itself. In each case these formal systems emphasise, and play out, a model of being where what "is" - the nodes or entities in the ontology - is dynamically entangled with the relations between entities.

Finally phenomena such as corpse graffiti show how this relational quality can arise through use, rather than design; how the attributes of a data-entity can be hacked to create unforeseen or unintended relations. Another striking example of this is Brock Davis' self portrait created by manipulating 3d objects in the editor environment for Microsoft's Halo 3; by tightly controlling a set of spatial relations within the game, the artist here in turn transforms that space, and the purpose and logic of the game environment [Arendt 2007]. Just as corpse names can be taken as words in a message, Davis shows how pre-constructed game objects can be taken as elements in an image. These practices show easily ontological intentions in world design can be diverted through use, and how the role of the player can shift from learning or internalising the formal ontology of a game, to creatively navigating its range of potential manifestations. What "is", in these formal ontologies, is delimited by technical factors, permutations and combinatorics, not the imagination of the designer. The designer constructs a formal ontology with a certain representational, narrative or metaphorical task in mind; but as these examples show, alternative (and unintentional) worlds are often latent within that same formal system.

7. Conclusion

The software systems that underpin digital culture are fundamentally shaped, we argue, by their ontologies; that is, by the specific formal structures of entities and relations that make up those systems. These formal ontologies are never merely technical structures or functional devices to implement a designer or artist's intention. They transform philosophical ontologies - abstract conceptions of the structures of being - into real experience; they reveal the practical implications of certain ontological configurations. Conversely, computational ontologies are also generative; what unfolds from a given formal structure seems to readily surpass, or at least diverge from, the representational model or intended purpose that informed it.

Conventional forms in digital culture can be interpreted in part, we argue, as conventional formal ontologies. Software design in digital media is informed by the pragmatic conventions of the data model approach, in which an ontology is designed to

fulfill a certain representational function. In domains such as new media art and gaming, where representation is a far more abstract question, this approach results in formal ontologies that needlessly reproduce familiar (and questionable) models of "what is."

In the examples presented here we sketch some aspects of what we call strange ontologies, where conventional formal ontologies are tweaked or subverted and alternative models played out. Overall these examples emphasise dynamic, local, relational qualities over the global, static and objective. This demands further investigation, but suggests an interesting philosophical movement within digital culture, away from a mechanistic or objective paradigm.

Through this exploration of strange ontologies, digital games have emerged as a significant point of focus. These concepts may be more immediately apparent in games for two reasons: (a) the act of playing is more directly engaging and involving in comparison with the detached viewpoint present in most software simulations; and (b) defining set tasks and goals to be achieved focuses attention on the ontology of the system as typically the problem-solving required to complete a game requires a deep understanding of entities and relations.

However, these ideas can be applied to any simulated world that is expressed through computer software.

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