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Paper: A perspective on Perspective and the genesis of generative narrative

Topic: Art, Artificial Behaviors

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Abstract:
Artificial Aesthetic artifacts produced by computational systems have been in the focus of our previous work, namely in the development of an analytical model [4] that addressed many procedural affinities found in these systems. This model attested to the importance of computational characteristics and of procedurality as conceptual foundations and aesthetic focuses in their own right. By studying sets of inherently multimodal artifacts, we discovered that sensorial modalities were more than aesthetic or communicational resources: they mediated the logical and mathematical structures in the artifacts' processes. The methods through which we, the human counterparts in the cybernetic aesthetic experience, build awareness of the processes that are developed within the artifacts, displace and remold our sensorium [5] and result in what we may call a *procedural* modality. This is dependent on sensorial modalities but unlike those it is for the most part intellectual: reception happens sensorially, while perception is a cognitively developed epiphenomenon [1]. The sensorium mediates the experience of the artifact and the brain fabricates perception, developing simulations of varying accuracy that through processes of patternicity [3] and deduction try to reduce the sensed complexity and to anticipate the outcomes of the witnessed processes.

When experiencing an artificial aesthetic artifact, we watch it perform as we simultaneously perform it, we probe its structure and draw the connections needed to participate in and comprehend it. Most of the times unwillingly, we simulate its processes and create our own parallel sequences of probable events as the artifact unfolds. In these systems, anticipation, the validation of simulations and the eventual violation of expectation therefore play a major role in the creation of narrative. As with other aesthetic constituents of these systems, narrative and drama may either be hard-coded — much as they are in traditional or non-procedural media — or they may emerge from the system. In this paper we propose an approach to how the creation of narrative can be understood in the context of performative or interactive generative systems, in an attempt to integrate in our model [4] the *perspective* variable originally proposed by Aarseth [2] in his study of ergodic texts.

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A Perspective on *Perspective* and on the Genesis of Generative Narrative

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Abstract

Aesthetic artifacts produced by computational systems have been the focus of our previous work, namely through the development of an analytical model that addressed the procedural affinities found in these systems. This model attested to the importance of computational characteristics and of procedurality as conceptual foundations and aesthetic focuses on their own right. By studying sets of inherently multimodal artifacts, we discovered that sensorial modalities are more than aesthetic or communicational resources: they also mediate the logical and mathematical structures that are found in the artifacts' processes. The methods through which we – the human counterparts in the cybernetic aesthetic experience – build an awareness of the processes within the artifacts, displace and remold our sensorium and result in what we may call a *procedural* modality. This is dependent on sensorial modalities but unlike those it is for the most part an intellectual process: reception happens sensorially, while perception is a cognitively developed epiphenomenon. The sensorium mediates the experience of the artifact and the brain fabricates perception, developing simulations of varying accuracy that through processes of patternicity and agenticity try to reduce the sensed complexity and to anticipate the outcomes of the witnessed processes.

When experiencing an artificial aesthetic artifact, we watch it perform while we simultaneously perform it, we probe its structure and draw the connections needed to participate in and comprehend it. Even if most of the times unwillingly, we simulate its processes and create our own parallel sequences of probable events as the artifact unfolds. In the interaction with these systems, anticipation, the validation of simulations and the eventual violations of expectations, play a major role in the creation of narratives or narrative-like experiences. As with other aesthetic constituents of these systems, narrative and drama may either be hard-coded — much as they are in traditional or non-procedural media — or they may be emergent. This paper proposes an approach to how the creation of narrative can be understood in the context of performative or interactive generative systems, in an attempt to integrate in our model the *perspective* variable, originally proposed by Espen Aarseth in his study of ergodic texts.

1. Computational Artifacts

Computational artifacts have become nearly ubiquitous in many aspects of contemporary live, including cultural creation and consumption. They are regularly used in the production, presentation and distribution of many arts and media, sometimes replacing previous analog resources, sometimes allowing the discovery or development of whole new niches or specializations and creating entirely new media.

In many technological arts, such as cinema or audiovisual production, not only have computational devices become omnipresent, being found in most areas of production, presentation and distribution, as to some extent they have pervaded the entire creative and commercial cycles of the arts, that can currently be integrally developed without the use of analog means.

When used as tools, computational devices allow the discovery or the invention of whole new processes but also the simulation of previously existing tools. Very often they allow increases in speed, reductions in cost, or both, therefore eventually replacing many of their analog counterparts. Their success in this area is due to their ability to develop highly efficient simulations, as most computational devices are universal machines, able to reproduce and simulate any process that can be reduced to algorithms. They are also able to simulate any medium that can be digitized, which leads to the computerization of the media, and to their ultimate absorption by computational devices. Media become virtual, shedding their materiality and going through a phase transition from matter to bits.

When these devices act as media, their capacity to remediate [7] promises unprecedented fidelity of reproduction, safety in archival and an extreme portability, it may therefore be no exaggeration to claim that very often media benefit from the transition to the digital domain.

However, the shift in distribution technologies is but the first stage in this transition. Computational media must not necessarily abide to the classical traits — or one could say limitations — of analog media, among which we can list linearity, determinability and controlled access. They are perfectly suited to act in such ways, being able to become more thoroughly linear and determinable than analog media, as Aarseth noted [1], by using the laws of code [19] to enforce controlled access in much stricter ways than analog alternatives are able to.

But simultaneously, they ache to be released from the constraints of the classical roles of the media. Computational media permit the departure from some of the attributes of analog media: they allow non-linearity, indeterminacy and random access to be developed in scales that non-computational media are unable to achieve, due to their capacity for various degrees of autonomy [9], both from their creators, contexts of creation or wreaders, as well as from hard-coded information or other external data. Able to develop a plethora of cybernetic communicative acts, they can be manipulatable but also richly interactive. They achieve permanence from transience; they simulate stillness as an outcome of dynamic processes.

As creators, our usage of these devices must be guided by the awareness that even when acting as media, they are capable of simultaneously becoming tools to operate on the media layers they produce. They are capable of reshaping the experience, form, content and expressiveness in runtime. They are able to transform the operational space of the arts, expanding it well beyond the field of possibilities offered by classical media, pushing it further, breaking out and constructing new spaces. They become able to exert some judgment over the products of their operation, to reconsider past choices in deciding where to follow in upcoming steps [5]. They are able to act creatively and to do so in concert with their human cooperators, becoming a new form of artificial aesthetic artifact.

2. From Amodality to the Core of Multimodality

Before being conveyed as sensorial stimuli or aesthetic phenomena, a computational artifact is built from code and software. If we undertake an analysis of the artifacts following Hunicke, LeBlanc and Zubek's MDA formal approach [18], we are able to describe a first set of components, the "rules" of the artifact's mechanics, "the particular components (…) at the level of data representation and algorithms" [18]. Following these, a second level of the system emerges, where we find the dynamics, "the run-time behavior of the mechanics acting on [wreader] inputs and each others' outputs over time." [18] Finally, and from these two, emerges the third level of aesthetics, where we discover the experiences that very often are the goal from the system's designer and that frame the wreader's point of view on the artifact.

We find that at the levels of mechanics and dynamics, artificial aesthetic artifacts most often operate in an amodal space of possibilities, a 'proto-sensory' flux that preconditions the differentiation of the sense modalities [15], and at which the artifacts can take arbitrary forms, because they possess no "natural mapping" and their "critical operations all take place invisibly through internal representations" [25] of a highly abstract nature.

It is only in the verge of aesthetics, when the processes of computational artifacts are transcoded — in the sense proposed by Manovich [21] — that they become modal and multimodal. This is the moment when processes are brought to physical reality and are expressed through concurrent modalities. Most of these are directly linked to the human sensorium [31]: visual, audial and haptic, as well as the perception of motion (that although related to vision can be independently analyzed). Furthermore, we can expand the definition of modality to include, as proposed by Stephanie Strickland [30], the perception of mathematics or mathematical structures, rhythm and harmony. We may therefore propose the description of a 'procedural' modality, that should not be understood in the Pythagorean sense, as a correspondence between art and mathematics in terms of numerical 'harmony', but rather as the intellectual and intuitive understanding of structure and process, and the aesthetic pleasures associated to it. This modality is responsible for the beauty of abstract understanding, not of bodily contact but of cerebral perception. We may also link it to the design stance that humans tend to seek in inanimate objects, or to the intentional stance sought in animate objects [27], the first of these trying to discover a purpose to an object, the later trying to understand motivations and emotions.

The first four modalities are sensorial, directly dependent on vision, audition, touch and proprioception (as the haptic modality frequently involves more than simply the sense of touch, related as it may be to movement through space or other involvements or perceptions of the wreader's body). They are frequently crossed, combined or mutually reinforced, contributing to the communication of the internal processes of the artifact to human wreaders and therefore, to the emergence of the procedural modality. In the process of transcoding, the internal potential translatability guaranteed by code must be relinquished to ensure human readability and, as this happens, a further process of translation must take place. The internal translatability is not only found between modalities, but also between media — images, sounds, films, texts, and so on —, reducing programmed, self-generated and user-generated information to a similar code [16].

Once communicated to humans, stimuli go through reception and perception, two complimentary but nevertheless contrasting processes [17]. Reception gathers inputs that are starting points to perception, where symbols are then selectively triggered and meaning is deduced. The procedural modality is therefore not directly sensorial, as the previous modalities, but rather cognitive and intellectual, and is found at the core of the multimodality of artificial aesthetic artifacts.

3. From Illusion to Simulation, from Patternicity to Agenticity

The human sensorium mediates the experience of the exterior [4] through illusion and simulation. Perception never exists through sensory channels, as the brain uses the body's specialized sensory signals to *fabricate* perception [10]. Objects, artifacts and the whole of the external reality are sensed and recreated in what invariably results in a subjective experience.

Very often this illusion is based on the direct reception of stimuli, however, at times it may be based on a construction of double illusions, as in the case of film — where the real motion between frames remains unseen while it creates the perceived movement-image —, or it may be based on the stacking of multiple illusions, as in video or audiovisuals. Perception is therefore an epiphenomenon, "a collective and unitary-seeming outcome of many small, often invisible or unperceived, quite possibly utterly unsuspected, events" [17], a large-scale illusion. Perception is subjective because it is an illusion and a simulation developed at a higher level than the sensorial creations but also because it is a process where meaning is inferred or created [12]. We distill meaning from the sensed, from reality and media, located in the external world from which the meaning-maker brain is irremediably isolated. The procedural understanding of what is sensed, of its rhythm, structure, order or harmony, contribute to a further, intellectually constructed simulation, that of causal procedurality, of the processes or algorithms that originate the phenomena. Drawing from clues available to the senses, the universal machine of the human brain tries to reconstruct the processes or their best possible approximations, to build internal simulations that predict the external processes and that try to anticipate them. Successful anticipation is then taken as a proof of successful simulation, and a corroboration of the acquired knowledge.

Human brains constantly try to reduce perceived complexity, to make “unfamiliar, complex patterns made of many symbols that have been freshly activated in concert to trigger just one familiar pre-existing symbol (or a very small set of them)”, to “take a complex situation and to put one’s finger on what matters in it, to distill from an initial welter of sensations and ideas what a situation really is about.” [17] The brain tries “to look for and find patterns”, the process that Michael Shermer describes as ‘patternicity’ [28].

If a simulation is not able to ever tell us anything that one does already not know, because it is no better than the assumptions that one builds into it [29], and that are deduced from the received data, there are ways in which a simulation can in fact provide new knowledge, even when one is not in possession of a complete or even a reasonable set of data about the laws that govern a system. Sometimes, by abstracting the details of a set of phenomena, one may find a faster path towards its simulation because “we do not have to know, or guess at, all the internal structure of the system, but only that part of it that is crucial to the abstraction.” [29] Therefore, even incomplete or partially abstracted simulations can provide relevant data to be integrated in new models, contributing to their continued development. If and when partial simulations can be compared between themselves and with the external phenomena, the process can be sped up through a quasi-evolutionary selection of those abstractions that are able to provide more accurate predictions of the external phenomena.

A simulation may produce seemingly accurate results despite being based on false assumptions, developing a process that is dissimilar to the original but happens to produce similar enough patterns of outputs. There is a wealth of examples of such approximations, to be found in natural sciences and their “skyhook-skyscraper construction (...) from the roof down to the yet unconstructed foundations” [29], or in emotional responses, that help “us judge what is good or bad, safe or unsafe, while also providing a powerful communication system for conveying feelings and beliefs, reactions and intentions” [26].

Furthermore, an incomplete understanding of the procedural aspects of a phenomenon may indeed be enough because “what happens on the lower level is responsible for what happens on the higher level, [but] it is nonetheless irrelevant to the higher level”, being therefore possible for the higher level to “blithely ignore the processes on the lower level” [17]. Consequently, if a simulation produces results that are accurate enough with a sufficiently high frequency, it may be judged as correct even if based on otherwise incomplete or erroneous assumptions. This is what we find in the so-called “Eliza effect”, caused by the human susceptibility to read far more understanding than is warranted in the sensorial manifestations of computational devices [17].

The Eliza effect was named after the ELIZA software, written by Joseph Weizenbaum in the mid-1960s, a context in which it was often experienced [14]. It is due to simulations built on erroneous principles that lead to the projection of traits like sentience, intelligence and personality onto machines that were not programmed to develop them and that are absolutely unable to manifest them. This is something we do because these traits are very often the best models readily available to develop a simulation that may produce outputs not dissimilar to those that are witnessed. The Eliza effect can be described as the outcome of three complementary phenomena: 1) the anthropomorphization of technology (with roots in that of animals and inanimate things); 2) the artificial artifact's concealment of processes that are not relevant to the human-side of the interaction or may not be easily or directly understood by the human counterparts; and 3) the strong effect of surprise — or what we can also call of the "violation of expectation" [2] — when interacting with a computational system.

But there is fourth further cause, which we may describe as the natural tendency to develop theories of mind for those processes or phenomena that possess enough complexity to be able to be described as possessing a mind or something akin to one. Because we frequently resort to this strategy when we try to interpret ourselves, other humans or any beings endowed with a mind (regardless of which complexity is perceived in such a mind), we naturally fallback to the same approach when facing complex systems like artificial aesthetic artifacts. After finding patterns, the brain "infuses those patterns with meaning", developing a process of 'agenticity' [28].

We try to understand how a system behaves by using our mind to get "ourselves into [its] mental shoes" [22], trying to 'think' as it does, to operate along the same lines, i.e., to simulate it. In the process of perception our brains do not simply register phenomena but rather affordances in those phenomena, sets of possible behaviors, usages or interactions to be experienced, whether these are actual or virtual. While we see an object, "we are also unconsciously swimming in a sea of possible behaviors. As it turns out, the traditional philosophical distinction between perception and action is an artificial one. In reality, our brains employ a common coding: Everything we perceive is automatically portrayed as a factor in a possible interaction between ourselves and the world." [22]

4. Anticipation and the Violation of Expectation

The operations of a mechanical artifact can often be understood with relative ease, while logical or algorithmic processes developed by artificial aesthetic artifacts are, more often than not, of a higher degree of complexity. Coupled with the very high processing speeds that these devices are capable of achieving, this complexity creates a barrier to their comprehension. During interaction with these artifacts, their aesthetic and expressive behaviors —respectively tied to the sensorial reception and intellectual perception — are simulated and predicted. These behaviors are encoded by prescriptive rules, at the artifact's mechanics level and, as the processes unfold, the human interactant predicts their outcome by elaborating sets of descriptive rules. The interactant builds anticipation as to whether these simulations will be proven correct or if, on the contrary, expectations will not be confirmed. This intellectual tension, coupled with the key-points that allow the evaluation of the simulation, is at the foundation for the emergence of narrative, aesthetics and even drama, as defined by LeBlanc [20]. This is the point where the wreader starts reversing the path outlined by the MDA framework, from a perspective at which "aesthetics set the tone, which is born out in observable dynamics and eventually, operable mechanics." [18]

As with any media message conveyed by an artificial aesthetic artifact, narrative, drama and tension may be hard-coded and posteriorly reproduced. Acts and multiple arcs, stable situations and the inciting incidents that unbalance them, big events, goals, obstacles, commitments, crisis and showdowns, protagonists and antagonists, accompanied by a host of other characters, may be predefined [3]. When this happens, however, the artificial aesthetic artifacts are used simply as media, not only not taking advantage of their added capabilities but also partially resigning the potential of procedural authorship [24].

Where elements of a more or less classically structured narrative do not exist, when simulations are developed through the procedural modality, a narrative experience may emerge from the tension between simulation and its validation, from the probing and mapping of the logical depth of the artifact [13]. As characters in a script, artificial aesthetic artifacts can be 'flat', failing to grow or change, to significantly develop or to violate our expectations during the time of our experience, or they may be 'round', reacting to conflict or other stimuli, allowing themselves to be shaped and changed and, in doing so, frequently violating our expectations (although not always positively).

Difficulty of simulation and the consequent violation of the simulator's expectations are the customary signs of non-mechanical systems. The creation of large patterns as a result of many smaller effects is one of the singular attributes of living systems [24]. Throughout human history complex systems were found in the natural world, not in the realm of the artificial, of the products of man's labor, for the most part characterized by repetition and predictability, as the epithet 'mechanic' so well expresses. We generally do not endow artifacts with a mind, emotions or personality in the same way as we do to humans or in various degrees to animals [17]. What we start experiencing with artificial aesthetic artifacts is not fundamentally different from what we have experienced for millennia with people and animals and classical narratives, and some of the barriers we encounter in the process are effectively the same. It is people — including ourselves — that we most often try to simulate through the development of theories of mind, but it is in successfully simulating people that we most often fail.

The complex patterns that form a person's 'I' cannot be studied at the level of the micromachinery of the mind because we are congenitally unable to focus on it [17], we therefore resort to abstractions and shortcuts, and to channels of communication such as language that, although slow and indirect, allow us to develop minimally effective simulations of other people's minds. But these will inevitably generate predictions that will most likely fail to be verified because a person's 'I' is a convoluted illusion, as are others to each other and to one self [17].

Furthermore, there is an added difficulty with these complex simulations, one that is found at the level of the referential information, of the hypotexts surrounding a person. As Hofstadter puts it, "We are all curious collages, weird little planetoids that grow by accreting other people's habits and ideas and styles and tics and jokes and phrases and tunes and hopes and fears as if they were meteorites that came soaring out of the blue, collided with us, and stuck. What at first is an artificial, alien mannerism slowly fuses into the stuff of our self, like wax melting in the sun, and gradually becomes as much a part of us as ever it was of someone else (though that person may very well have borrowed it from someone else to begin with)." [17]

We are all simulating and emulating each other to varying degrees, "an inevitable consequence of the power of the representationally universal machines that our brains are." [17]

5. The Procedural Drama

Originating in an amodal space of possibilities, processes are mediated by and through the artifact. After reception and perception, what was communicated modally, once again becomes amodal or metamodal, as Morbey and Steele propose [23]. We find ourselves in a new abstract domain that is similar to what Whitelaw [31] defines as inframedia. Procedural capacities are the key to our identification of amodal characteristics in the perceived phenomena, as they are at a later stage fundamental in the process of simulation.

The understanding of processes and their simulation is not always straightforward, as there is not necessarily a direct mapping between the code and its modal manifestations. There is no blueprint; there are constraints [11]. Furthermore, each modal manifestation may be directed by contrasting processes or be developed at disparate rates. Cross-modal expressions may be created by multiple transcodings in the same system or by multiple systems or threads operating (and transcoding) simultaneously, which they can do independently or in tandem, eventually acting on each other, etc.

The translation processes from code to form, from genotype to phenotype are also not reversible: morphogenesis is generative and therefore it is "impossible to map exactly phenotype in to genotype, since this is the result of epiphenomena, a visible consequence of the overall system organization." [8] On the perceiver's side, we are left with sensations, feelings, perceptions and symbols below which we are unable to peer; we are at a private and incommunicable space.

The outputs of artificial aesthetic artifacts fundamentally differ from what we find in most classical media because, much as nature itself, they weren't necessarily created or shaped by humans. These artifacts are rich with generative potential and they have their own aesthetics, their unique patterns of desire, their ways "of giving pleasure, of creating beauty" [24]. They are inevitably mediated but also hypermediated [6], constantly confronting us with signs of what may be happening behind their modal expressions. It is this layer that truly marvels and that allows the experience of the artifact as a symbolic drama in which we, the wreaders, are inevitable protagonists.

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