

SEARCHING MEANING THROUGH PROCEDURALITY IN COMPUTATIONAL ARTEFACTS

ID 398

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ABSTRACT

Contemporary media and arts often deploy computational systems to develop complex algorithmic experiences. Many of these are created around somewhat conventional narrative structures, building on familiar media conventions. Others are related with videogames, drawing on game and interaction mechanics that have also been becoming increasingly familiar.

Very often, however, we are confronted with artefacts that eschew these conventions to develop aesthetic experiences grounded in conceptual and mechanical principles that are not inherited from molar media but that are native to computational systems.

Building on unconventional mechanics, these systems create new challenges not only to readers but also to artists and designers developing them. The interpretation of these systems and the processes of creation of meaning developed by readers/ audiences need to be understood if we intend to develop works capable of providing enough information regarding their procedural framework. Only then will these be able to ground their aesthetic potential on procedural structures rather than strictly on surface characteristics. Contingent behaviour, learning, adaptation, selection, etc., can now be common traits of media and artworks, but because they are not necessarily visible or immediately understandable, and because these media forms are still recent in the media landscape,

procedural properties need to be framed in ways that allow them to be discovered and understood, that allow them to be enriched by the processes of interpretation and by the errors or deviations that may affect them.

Keywords

Computational Art and Design; Ergodic Media; Artificial Aesthetics;
Creation of Meaning; Procedural Interpretation

1. INTRODUCTION

Processor-based media are becoming the dominant forms in our landscape. They are metacommunicational apparatuses (Engle 2008, 15; Manovich 2013), excellent simulators of other media, able to easily and economically take over their roles, acting as a universal solvent (Hayles 2005). This leads them to be better described, as Murray (2012) suggests, by the collective noun digital medium.

By replacing previous media, they do not necessarily transform their contents. Processor-based film can be indistinguishable from analogue forms, processor-based books may retain classical structures, and several other patterns in the contents of media forms are also not inevitably transformed by the change in distribution technology (Jenkins 2006).

A case in point are linear narrative structures, that are still experienced in processor-based media. As in previous media, linearity may not be due to structural characteristics but rather, as Aarseth hypothesises, to ideological reasons or to the remote influence of the linear-access papyrus scroll (1997, 47; Bolter 1984, 137). We may further speculate that their prevalence may be related to the linear way how humans experience life, and how they may prefer to recall and codify its experience, regardless of how nonlinear or discontinuous thought processes may be.¹

Not all non-procedural media are linear. Random access technologies such as the codex were explored to breed nonlinear textuality in proto-hypertextual structures as encyclopaedias (Aarseth 1997, 48; Darnton 2009). Some authors have questioned linearity through other forms of access, as e.g. Julio Cortázar with *Hopscotch*, or the Oulipo. Although not using computational technologies, their works were procedural, relying on algorithms, and comprising surface and *subface* (Nake 2016).

Already *cybertexts*, they hinted at the potential complexity of the experiences that native procedural forms would soon make possible.

Although processor-based media have continuously drawn from familiar experiences and from conventions of classical media forms, there is an increasing number of native computational forms that eschew some of those conventions, grounding their aesthetics in their procedural nature. Amongst these we can find games that develop potentially infinite worlds, as *Spelunky* or *No Man's Sky*. Games as *Façade*, that use artificial intelligence to “move beyond traditional branching or hyper-linked narrative” in interactive drama.² Interactive documentaries as *Do Not Track* that rely on the Web and social platforms to build the narrative experience. Artworks that bring procedurality to the fore, as *Every Icon*, *KNBC*, *Monochromes*, or *Microcodes*.

2. AESTHETIC CHALLENGES

These examples demonstrate the pervasiveness of processor-based media, and allow us to start pondering some of their effects. As technology and media change, human perception is altered (McLuhan 1964). If we regard perception as a system through which one builds hypothesis about the world (Gregory 1980), it follows that contact with any media form is not only informed by knowledge of other forms, but also that new technologies and media breed new modes of reading. Some of these have been studied by e.g. Joyce (1995), Aarseth (1997), Bolter (2001), Cramer (2001), Kwastek (2013), or ourselves (2016), and they are not only related to the interpretation of signs, but also to other user functions and interaction, which adds a new layer of complexity to the artefacts.

Another layer of complexity is added by the increasing multimodality of media that, besides the most frequent sensorial modalities, also prompt what we may describe as a mathematical (Strickland 2007) or procedural modality. This multimodality may lead audiences to experience a strong feeling of defamiliarization that can breed divergent interpretations of their contents (Melo 2016). This is particularly important to keep in mind when we conclude that the creation of meaning is now not only dependent on the interpretation of signs but also on the procedural modality, therefore, not only on logical and lexical semantics but also on procedural semantics and consequently on procedural rhetorics (Bogost 2007).

By trying to grasp the subface of these media forms, the reader attempts to simulate them, developing hypothesis, confirming, falsifying or modifying them during the

experience (Carvalhais 2011; 2012; 2013; 2015). The success of these efforts is not only dependent on herself but also on being able to establish multiple contacts with the system. If a nonlinear, open (Eco 1989), or generative (Galanter 2006) artefact is impossible to access in its entirety — either because it is infinite, or because it is vast enough to become infinite-like at a human scale — a simulation that is able to generate predictions of the system's behaviours and outputs can be seen as the culmination of its experience by a human. If the reader has access to multiple instantiations of the process, amassing multiple samples, she may be able to — through the procedural modality, her previous experience with other systems, and virtuosic interpretation (Carvalhais 2015) — arrive at a *theory of the system*. This will be a part of the process of reducing uncertainty about the system, of acquiring information about it.

2.1 Risks

This process of developing a theory of a system involves some risks. The first of these was identified by Aarseth as the *aporia*, an inaccessibility that is not “ambiguity but, rather, an absence of possibility” (1997, 3). This is not the aporia experienced when one cannot make sense of a part in spite of having access to the whole, rather it's an aporia that prevents making sense of the whole because a particular part may not be accessible (1997, 91). We may identify another form of aporia: as a player and gambler within the system, the reader risks deducing incomplete or incorrect information, thus developing an inadequate understanding of the system (Wilden 1987) that leads to incorrect simulations and dysfunctional actions. Although failure may lead to learning (Juul 2013), this only happens when one is made aware of it.

Secondly, we have the risk of becoming *lost in the finite*, to use Kierkegaard's terminology, describing instances when one is bound by necessity, fate, and triviality, thus having reduced agency or autonomy within a system, losing one's individuality in the process. Thirdly, and conversely, one may become lost in the infinite, with this corresponding to the continuous sampling of paths and actions in the system without ever actually understanding it. Whether one is focused in the *finite*, the concrete status or configuration of a system at a given time, or see their experience diluted by the *infinite*, the potential that doesn't really become knowledge, one risks failing to understand the system. And one usually also fails to understand that the procedural modality requires the dialectic balancing of these opposite tensions. Finally, and as a synthesis of these tensions, and of their ergodic weight, the reader risks anxiety.

Traditional textual and aesthetic analyses are usually coupled with permanence and stability, if not of form, at least of structure. The *infinite* character of these processor-based systems very often leads to a permanent transformation and renovation of surface structures, thus inhibiting a classical approach and often favouring analyses supported by procedurality and leaning towards artificial aesthetics.

3. POIETIC CHALLENGES

Creators that want to use these *new media* to their fullest extent need to understand how relevant surface and subface become in their creation, development, and effective communication with other systems, human or otherwise. An awareness of the three levels of semantics — logical, lexical, and procedural — also becomes quite urgent if one expects to clearly understand how these forms are interpreted. Finally, understanding these as semiotic forms that breed algorithmic signs (Nake 2006) is vital to design for virtuosic interpretation.

This effort may be developed through the usage of code, procedural descriptions, even explicit code, as we previously explored (Carvalhais 2015), but is perhaps more likely to succeed if the designer considers the aesthetic experience in all its complexity, and e.g. plants procedural clues in the surface structures of the system (or at the very least, does not camouflage whatever clues may already be in place as a consequence of the system's operation). Designing for the procedural modality implies being aware of the evolution of the phase space of the system, of how a horizon of action is formed, how it changes in runtime, and how it sparks the fleeting horizon of intent. The horizon of action is the set of all points in the phase space that are accessible to the reader, given the local constraints. The horizon of intent is the set of those states that the reader believes can be "valid, attainable, and desirable in the near future" (Upton 2015), and is defined by her constraints. We may thus think of the *system as encountered*, defining the horizon of action through mechanics, and the *system as understood*, spawning the horizon of intent through semantics, interpretation, and the procedural modality. Keeping this in mind, the careful balancing of repetition and novelty, of entropy and information in the experiences being designed becomes crucial for the success of processor-based media forms, and for the emergence of meaningful experience.

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Notes

1. *The narrative theory of the self (Florida 2014, 68) points to the construction of a linear story as the basis for one's identity.*

2. <https://www.thelineofbestfit.com/news/latest-news/blonde-redhead-to-release-new-ep-next-month-share-first-track-3-oclock>