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Computational Media and the Core Concepts of Narrative Theory

Abstract: During the last two decades, computational media—a technology able to simulate virtually any system—have permeated all aspects of contemporary society and culture. So far, narratologists have mostly neglected this progression, which is also known as the digital turn. While the current developments have called our attention to phenomena such as narrative representation across media, the core of narrative theory is still firmly rooted in concepts constructed from the basis of verbal structures and content that can be deemed fixed or unconditional. This article argues that we need to extend the scope of narratological inquiry towards the machines of computational media. With the help of conceptual tools borrowed from software studies and digital humanities, the article first identifies three main properties which distinguish the computer from the earlier forms of media: database, procedurality, and reciprocity. It is then shown how these properties challenge some of the core concepts of narrative theory—plot, character, and storyworld—in the analysis of storytelling in computational media. Finally, it is suggested that in the future, narrative theory might put more emphasis on, firstly, authorship as design and, secondly, the performative acts that the designs invite and enable. The article thus points towards understanding the transformative effect of computational media on the ways in which we see the world and engage with it through the time-honored gift for storytelling.

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The ancient technology of storytelling is becoming more and more enmeshed in a computational environment along with the rest of our culture and society. To borrow an expression from N. Katherine Hayles, narrative is now part of “a complex ecology” (*How We Think* 176) of computational media. So far, this development, along with the digital turn in general, has mostly escaped the attention of narratologists. This article argues that the computer has effected significant changes to the affordances of storytelling, and to understand these changes, we must look beyond mere “output”—such as media objects as content—to the machines and their workings (see Wardrip-Fruin 2–3). As a field, narratology is still firmly rooted in literary criticism, and, consequently, its primary concerns are verbal narrative structures and strategies. Furthermore, the core of narratological concepts is predominantly based on understanding the objects of research as printed or otherwise clearly definable artifacts. Therefore, the focus has been on content that can be deemed fixed—such as conceiving of the narrative text as a “thing.” The rise of computational media now challenges this, signaling a decisive shift away from such unconditionality.

There are, of course, a few trends with a more broadly defined base on narrative in media emerging. For example, in the October 2017 issue of *Narrative*, Markus Kuhn and Jan-Noël Thon suggested broadening the perspective from the verbal bias of literary criticism within what they call “transmedial narratology.” Their approach is based on the valid observation that while various phenomena studied by narratologists are widely agreed to be medium-independent, the focus of the research is still mostly medium-specific (254). This article argues, however, that the concepts at the heart of narrative theory require revisions before they can be applied to storytelling across the spectrum of computational media. The main reason for this is also behind the rapid proliferation of transmedia: the computer’s ability to simulate any system and thus incorporate all artistic media.

THE COMPUTER AS A MACHINE AND ENVIRONMENT FOR STORYTELLING

In her treatment of transmedia storytelling, Marie-Laure Ryan mentions in passing that the “time-honored phenomenon of spreading culture-defining stories across media” is undergoing changes due to the computer’s ability to encode and transmit all kinds of information (“Transmedia Storytelling and Transfictionality” 362–63). There have been a couple of new theoretical directions dedicated to dealing with storytelling as it relates to computational media. These include the study of “digital storytelling,” which mostly focuses on the ways the computer can be used in classrooms and other learning settings (e.g., McGee; Ohler), and the rather structuralist attempts to computationally model “the algorithmic processes involved in creating and interpreting narratives” (Mani) or to define “interactive digital narrative” (e.g., Koenitz et al.). Both, but especially the last of them, are based on the underlying assumption that narrative itself would somehow be different in computational media—which is not the case in my view. Ruth Page has, similarly, argued in her study on stories in social media that there is no genuine dichotomy between the stories in the old and new forms of technology (186). In this article, then, I concentrate on the affordances of the computer¹ as a machine and environment for storytelling instead of on stories themselves.

In order to get a more thorough picture of the ongoing change, I suggest distinguishing two distinct layers. Firstly, there is the layer that has already been observed in narrative theory covering the analysis of phenomena such as the transfer of media characteristics from one medium to another or narrative representation across media (see Elleström; Thon, *Transmedial Narratology*). Furthermore, this layer includes “transmedia storytelling” (a term which media scholar Henry Jenkins popularized in 2006), the practice of using multiple media platforms to create narrative experiences. Transmedia storytelling has been described in terms of the convergence paradigm, which assumes that “old and new media” will interact in ever more complex ways (Jenkins 6).² Both terms have since become hallmarks of contemporary participatory culture, and for this reason, transmedia studies have often been associated with storytelling in “new media.” This is no wonder;

to paraphrase Lars Elleström, we could say that the computer can “transmediate” most (if not all) artistic media (37). However, storytelling in the form of using multiple media platforms is an age-old practice rather than “something radically new and revolutionary if not ... *the* narrative form of the future” (Ryan, “Transmedia Storytelling and Transfictionality” 362, original emphasis). It can be exemplified by the dissemination of Greek myth through various artistic media and the fact that the Bible can be considered transmedia narrative as well (see Johnson).

Narratology should also recognize the second, more contemporary layer, which highlights one of the main characteristics of a postindustrial knowledge work as discussed by Alan Liu: the separation of content from both its presentational form and material instantiation (216). In this article, this layer is approached through the way (previously separate) media and their techniques get combined and remixed in the computer, thus creating a new environment for storytelling. With his focus on computational media, media theorist Lev Manovich criticizes Jenkins’s term “convergence” and suggests replacing it with “hybridization.” He argues that media languages do not “reach the same point” or “become gradually less different and eventually the same” but instead acquire new properties and become richer as they hybridize (*Software Takes Command* 171). With this argument, Manovich highlights the fact that media no longer only converge superficially in the form of transmedia storytelling, but also in a much more profound way in the computer. It has even been suggested that we could do away with the concept of medium altogether, as all previous media can be incorporated by the computer (see Harries; Jenkins). I would not go this far; for example, a medium can still be defined by its cultural use. In other words, a medium is distinguished from another by the particular ways in which a distinct media culture shapes the producers’ utilization of media affordances (Pearson and Smith 4; see also Ryan, *Avatars of Story* 23–25).

Either way, the development of the computer as a machine for storytelling has affected contemporary media in ways that cannot only be described in terms of the ancient practice of passing down stories over centuries through multiple media such as the written word and

paintings—as Derek Johnson, for example, seeks to do in his brief treatment of a history of transmedia. Manovich connects the profound change to the computer as a “metamedium” (an expression borrowed from Alan Kay’s 1984 article), but not in the sense of a “remediation machine,” which proficiently represents a range of earlier media, as famously discussed by Jay David Bolter and Richard Grusin in 2000. Instead, Manovich suggests looking beyond media surfaces to the layer of software: While in physical media adding new properties means modifying its physical substance, in computational media new properties can always be easily added or even new types of media invented by simply changing existing or writing new software (*Software* 91–92).³ For users who only interact with media content through application software (such as Adobe Photoshop), the properties of computational media are defined by the particular software as opposed to being contained in the actual content (152). As a result, media content now appears to us as something that can be cut, pasted, or reassembled with ease (see Murray, *Inventing the Medium* 57). From the viewpoint of storytelling practices, this change, together with the rise of network culture, marks a considerable shift from the model of transmission towards the model of circulation and manipulation of content. As Henry Jenkins, Sam Ford, and Joshua Green argue in their book *Spreadable Media*, we are moving “toward a more participatory model of culture, one which sees public not as simply consumers of preconstructed messages but as people who are shaping, sharing, reframing and remixing media content in ways which might not have been previously imagined” (2).

In short, to study narrative in today’s computational media, we need to look further than the practice of stories being disseminated through multiple platforms or earlier media being represented by the computer. Since the success of the computer as a media machine is most likely to continue, narratologists must be prepared to go deeply into the level of code and software. On this level, computational media represent “a new norm” compared to the prototypical narrative developed in the study of literary fiction, as Brian McHale puts it. For this reason, McHale also anticipates that

narrative theory “might become divergent and various, multiple *narratologies* instead of one—a separate narratology for each medium and intermedium” (302, original emphasis). In my view, rather than a separate narratology for computational media, we need work that refines and revises the core concepts of narratology developed from the basis of older storytelling prototypes. To do so, we must first take a closer look at the properties that distinguish the computer from these earlier forms.

BEYOND THE SURFACE: PROPERTIES OF COMPUTATIONAL MEDIA

The primary narratological emphasis on media content may be hard to shake, as it is still clearly embedded in the division of the modern academic study of culture and its disciplines (literary studies' focus on literature, for example). As long as narratological inquiry remains limited to the surface level of content, the fundamental differences between the computer and previous forms of media will not emerge. On the level of content, we can, for instance, choose singular “documents that represent the storyworld” that can “be stopped or replayed, so that they can be studied like a literary text or a still picture” (Ryan, “Transmedia Storytelling and Transfictionality” 385).

However, such analyses disregard both the workings of machines of computational media and the ways in which the users engage with them, whereas this article attempts to bring those to the domain of narratology. In this section, I discuss the computer's three main properties which distinguish it from what have variously been called old, legacy, or print media. Janet Murray's groundbreaking study *Hamlet on the Holodeck* (1997) initiated such work, arguing that computational environments are procedural, participatory, spatial, and encyclopedic (71–90). In what follows, I will illustrate these differences through three properties which borrow conceptual tools from Murray's original discussion and more recent updates to the fields of software studies and digital humanities.

Database, the first of the properties, is a feature of the computer's ontology. In his influential book *The Language of New Media* (2001), Manovich puts forth the idea that the database should be seen replacing "privileged narrative" as the key form of cultural expression of the modern age. His claim is based on the observation that "new media objects" are not structured according to the logic of a story in the sense that they would have a beginning or end—instead, they are collections of individual items, with every item possessing the same significance as any other (218). Therefore, although these objects are not databases in the sense of a standard dictionary definition,⁴ from the viewpoint of the user's experience they appear as such: collections of items on which they can perform various operations like viewing, navigating, or searching. Manovich goes on to argue that modern media is "the new battlefield for the competition between database and narrative" (234). In consequence, many scholars saw him as pronouncing the slow but inexorable death of narrative in the discussion that followed the publication of Manovich's book, as Marlene Manoff summarizes it (393).

For her part, Hayles has provided a more productive viewpoint to these two cultural forms: She suggests that instead of viewing the database as displacing narrative, the two are "natural symbionts" (*How We Think* 176). With its perspective on large-scale data collection and management, database represents seeing the world in terms that the computer can understand. Such a worldview has, indeed, gained more prominence during the twenty-first century and thus effected a change in the position that narrative occupies in the culture: It is no longer accepted as the sole explanation for large-scale events (such as the evolution of the universe or the effect of climate change). Instead, global explanations are now rooted in data analysis (181), and more and more of the authority previously held by culture-defining stories is bestowed upon databases. Hayles argues, however, that any interpretation of a database almost inevitably invokes narrative to achieve dramatic impact and significance (178). In other words, narrative comes in handy when the computational view of the world is made understandable for the human agent.

This introduces one of the most intriguing theoretical questions with regard to narrative and computational environments: the relationship between narrative interpretation and management of data. It is important to bear in mind that giving a narrative explanation to, for example, relational juxtapositions that a database constructs does not mean that the two forms would then dissolve into one another. Despite Manovich's view of narrative and database as competitors or enemies, I find his original description of new media objects quite useful for my discussion here (although these objects can hardly be called "new" anymore). Instead of being linear, fixed, or singular, they are open to various operations which the user can perform by means of software. The fact that such objects cannot be understood to be constructed according to the logic of a story but rather offer numerous ways to manipulate and make sense of open-ended content creates interesting situations where various interpretations compete, as "databases themselves can only speak that which can explicitly be spoken" (Hayles, *How We Think* 179). Murray has called this "the encyclopedic capacity of the computer" (*Hamlet* 84), which makes it a compelling medium for storytelling with a potential to tell stories from multiple vantage points, for example. In other words, computational media objects concretize the increasingly prevalent understanding of the ecology of narrative and database.

The second property I wish to discuss is procedurality, the computer's ability to represent and execute conditional behaviors (Murray, *Inventing* 66). Procedurality is, naturally, based on another key element of the computer, the digital code, which the humanities still overlook as an object of research. In his discussion of the digital "folding" of reality, David M. Berry suggests a new way of working with representation and mediation to take account of the plasticity of digital forms (1–2). In the process of digital mediation, a computer requires that an object is transformed into a grid of numbers that can be stored as a representation which can then be manipulated using algorithms. The process forms the basis of procedurality as the most significant difference between the computer

and earlier media of representation, often discussed by vaguely using the word “interactive” to describe the users’ manipulative work. The conditionality and plasticity that follow from this bring out the difficulties that scholars of narrative theory have had when trying to explain the representational strategies of computational media: traditionally, the user is visualized as navigating a branching or networking structure designed by the authors, thus engaged in making choices.

However, as a concept attempting to describe representational strategies or storytelling in computational media, spatial structure or model—or, “a system of choices” (Ryan, *Avatars of Story* 99)—appears as a by-product of both narratology’s emphasis on content and its unrecognized assumptions specific to print. Similarly, the observation of various possibilities that can be actualized during any given playthrough of a digital game (see Thon, *Transmedial Narratology* 120) only touches upon the surface of computational media. As Berry’s discussion on digital mediation brings out, we should not solely focus on content or on what is being represented, as it is not fixed but always subject to manipulation and therefore conditional and plastic by nature. Noah Wardrip-Fruin, researcher of digital media and fiction, aptly notes that although it is common to compare the creation of media with writing text, composing images, or arranging sound in the computational environment, “one must think of *authoring new processes* as an important element of media creation” (7, original emphasis). The designers do not author the representation itself but rather code that enforces rules to generate some kind of representation (see Bogost 4). In other words, the “procedural authors” are not present in the created content but in the ways the user’s agency within the environments is structured and shaped.

Although narratology excels at the analysis of representational strategies, most of the analyses where procedurality has been observed in connection with storytelling have so far been done in game studies. In digital games, for example, the events “portrayed” for the player are essentially produced by the act of play—instantiated from the archive of possibilities, so to speak. As a result, stories in games are not necessarily preconceived by the designers and then actualized

by the players but emerge during gameplay.⁵ In his critical essay “Against Procedurality,” Miguel Sicart has even argued that players do not need the designers at all, only a frame for play, as meaning is played. However, although players can indeed create their own unanticipated stories and other meaningful content especially in so-called open-world games, procedurality can also be used as a representational property in the form of codified rendering of responsive behaviors (see Murray, *Hamlet* 74). This requires an approach that differs from the narratological examination of structures, however nonlinear in nature. Furthermore, as a representational property, procedurality brings up the way on which the basic elements of stories—such as characters—have begun to acquire properties of computational media, a phenomenon that I discuss in detail below.

The last of the three properties, reciprocity, is closely connected with procedurality, but from the viewpoint of the user instead that of the designer. When it comes to understanding the computer as a media machine, it is not enough to observe the work of authoring processes or code that enforce(s) rules to generate a representation. In addition to this, we must pay attention to the fact that the computational environment must be meaningfully responsive to user input: Actions must be chosen and the effects related to the user's intentions. Within narrative theory, the way the computer responds to user input (while previous forms of media do not) has been discussed under the framework of interactivity, and analyses of storytelling have concentrated on the fact that the user is positioned as an active participant within a spatial environment. This is viewed as a challenge, since stories are understood to be temporal phenomena relying on linearity and authorial control. Ryan remarks that while interactivity is often thought to be made possible by the computer, it is “a dimension of face-to-face interaction that was shut off by manuscript and print writing and introduced to written messages by the electronic medium” (*Narrative* 160). The point that Ryan makes here is an important one, I think: Manuscript and print writing have indeed emphasized certain conventions—such as the notion that active participation by the audience would be

disruptive of narrative—while others—such as the various dimensions of interaction—have been eclipsed or completely shut off from the narratological theorization of storytelling.

There have been attempts to introduce other notions of narrative when it comes to computational media. Murray has discussed the bardic tradition as the basis for reconceptualizing authorship (*Hamlet* 188–94; I will return to this a bit later in more detail). For her part, Pamela Jennings has suggested that we should look towards oral storytelling traditions that embrace cyclic narratives and interaction between the author and the audience (347). Furthermore, in the analysis of the fictional dimensions of games, the concept of simulation has been used, as it is not tied to the basic assumption of somebody communicating, or at least choosing, the sequences of events presented to the user (e.g., Frasca; see Walsh, “Emergent Narrative” for a more critical analysis). Within a narratological framework, Ryan has introduced the concept of “productive” interactivity to describe the designers calling for users to create content and, thus, “leave durable traces on the system” (“Transmedia Storytelling: Industry Buzzword” 11).⁶ Ryan sees such a form of interactivity as a way of bringing together the top-down design of the producers of the system and the bottom-up activity of the users in, for example, a transmedia project that allows users to post public comments and to contribute their own materials (12). However, in this approach, “the system” becomes yet another thing in a similar sense to a text printed on the pages of a book (or in the sense that the early hypertext fictions were constructed).

So, although userly action is indeed facilitated by authored processes, the computer's representative power lies at the codified rendering of *responsive* behaviors (Murray, *Hamlet* 74). In other words, the “system” in the sense Ryan uses it above is essentially produced by the user's actions and the way in which the system responds. For their part, the processes designed by authors can be considered a part of communicating possibilities for action in a way that is comprehensible to users, since the workings of the human mind obviously differ from those of the computer. In a sense, this is about translating the spatial and inclusive ontology of the database to the temporal and

selective form of narrative (see Hayles, *How We Think* 183). The user is not simply on the receiving end, however, as they reciprocally communicate their actions and intentions to the computer. Thus, replacing the concept of interactivity with that of reciprocity describes computational media more accurately. Instead of being called to interact with a prearranged system or contribute to fixed materials created by the authors, users are engaged in a reciprocal action within the designed environment. As an environment for storytelling, computational media are therefore not focused around the idea of a single, defining story(world) but around the creation of processes or patterns on which varied instantiations can be based. This calls for certain revisions to the core concepts of narrative theory.

REVISING THE CORE CONCEPTS

Technologies affect the ways in which we engage with the world, either in the role of mediators or, more radically, by transforming the way we see the world, as computational media—with their ability to simulate any other system—are not “just another technology” (see Hayles, *Unthought* 33). While “narratives are everywhere,” as the old slogan goes, so are computational media, with their properties that challenge our old conceptualizations. Thus, in this section, I argue for a new take on some of the core concepts of narrative theory – plot, character, and storyworld – in the analysis of the ecology of storytelling and the computer. The intersecting aim, here, is to show that computational media have effected significant changes to the way we see works of fiction and the way we engage with them as part of our everyday lives. The need for acknowledging this is urgent, not only because the traditional boundaries between the so-called “cyberspace” and the space of the everyday have begun to dissolve, but also because human subjects are no longer contained by the boundaries of their skins (see Hayles, *Unthought* 3). For the more limited purposes of this article, it is important to note that the boundaries around the works of fiction have similarly blurred, and this is getting more and more visible in contemporary transmedia.

The first concept I want to discuss is *plot*. As a concept, it interestingly illustrates the plasticity and conditionality of computational media. Following Karin Kukkonen's apt summary of the uses of the term (par.11), we can consider plot either as the fixed pattern that will have emerged at the end of the narrative, or as a dynamic development in the progress of the narrative. As I discussed above, objects in computational media are not structured according to a logic of beginning and end—instead, their structure resembles that of database, the collection of individual items, with every item possessing the same significance as any other (Manovich, *The Language* 218). The former conceptualization of plot as a fixed, global structure will therefore not do: As such, it is reminiscent of (a somewhat problematic) understanding of narrative as a recounting of a prior story. However, the latter description of plot as a dynamic is more useful, especially from the viewpoint of facilitating the users' engagement with a work and of their search for patterns of meaning. By nature, computational objects are spatial and inclusive, as they can accommodate data indefinitely, while narrative as a form is sequential and selective. In my view, this dynamic can be observed in terms of plot through the understanding of narrative and database as “natural symbionts” (Hayles, *How We Think* 176), where the attention is focused on the relationship between narrative interpretation and management of data.

An illuminating example of the dynamic is *Voices 16*, a transmedial history project by BBC Northern Ireland. It revisits two epoch-making events in 1916: the Easter Rising and the Battle of the Somme (see <https://www.bbc.co.uk/events/e2d5v2>). A project of this scale would have not been possible without the current access to huge media archives and the affordances of the computer as a metamedium. The project includes various different media objects—web pages, photographs, video clips, Twitter feeds, television series, and so on—based on a massive amount of material from numerous sources. As one of its aims is to bring something to life different from “the stories of the history text books,” the project includes “testimonies” of thirty-one contemporaries of the events

put together from diaries, interviews, letters, memoirs, Military Service Pension files, newspaper articles, and such. Furthermore, each person's testimony is arranged in the form of a chronological biography. This is a telling example of the relationship between narrative interpretation and the management of data but also of the way the users' interest is guided and facilitated by the explanatory power of a sequential and selective form.⁷

If we perceive plot as one of the authorial ways of engaging users and maintaining their interest, we may examine the ways in which the designers of *Voices 16*, for example, have authored processes which allow the users to narratively interpret and make sense of the wide database that *Voices 16* provides. As Manovich argues, the “final media experience constituted by software usually does not correspond to any static document stored in some media” (*Software* 34). Thus, he suggests the term “software performance” to describe our experience as being constructed in real time. The users of *Voices 16* can, for example, quickly move horizontally from one “testimony” to another, focusing only on the sections covering “Easter Week 1916” while completely ignoring others. They can, therefore, structure their own understanding of the events instead of delving into the preconstructed biographies.

It is crucial to note that *Voices 16* is structured as an environment that is meant to be navigated, with the users defining what information they receive and how. Therefore, the “message” that the user “receives” is not just actively constructed by means of a cognitive interpretation but also actively managed (see *Software* 36). If plot is understood not only as the process that facilitates our interest but also as its target, “a pattern of meaning,” the way in which *Voices 16* can be connected to the move away from fixed content towards that of open-ended performances comes even more clearly into focus. The plot in computational media thus describes the ways in which narrative interpretation is brought to the realm of database but, importantly, it does not explain the whole of the database in the similar sense that it is often seen as “the target” of a narrative text.

On the basis of my above discussion, I am inclined to argue against concepts such as “nonlinear narrative” (see Thon, *Transmedial Narratology* 75), as they imply that users are “activators” of the processes that set the meanings contained in the environment in motion, or that they are “derivators” of meaning from the software-based system such as *Voices 16* (see Sicart). In her discussion of the bardic tradition as the model for storytelling in computational media, Murray suggests reconceptualizing authorship as the invention and arrangement of the expressive patterns that constitute “a multiform story” (*Hamlet* 188–94). In other words, the authorship does not lie within the design of a particular plot as a pattern of meaning but within the processes and structures that allow and invite us as users to construct such patterns in real time as we manage the data. In this sense, we perform the plot ourselves.

The second concept, *character*, brings up the importance of the relationship between design and performance to our engagements with storytelling in computational media. While drawing a comparison between the computer and the bardic system, Murray notes that the latter is fundamentally conservative, aiming to transmit a fixed story onwards. However, what is conserved “is not a single particular performance but the underlying patterns from which the bards can create multiple varied performances” (*Hamlet* 194). In her later book, *Inventing the Medium*, Murray describes computational objects as variables that can have multiple instantiations (53). To give a very concrete example of this from the realm of fiction, take role-playing characters (which, of course, have originated in non-digital form). When a role-playing character is instantiated, it is not created as a single version of an object (or a person) but as many possible versions with many variations.⁸ In other words, characters such as these may be considered to be templates or sets of modeled behaviors and properties rather than entities with clearly defined boundaries. In this section, my interest is in such entities which, due to the hybridization of media, have increasingly acquired properties of the computer.

While characters are typically seen as entities in a storyworld, they are not taken to be self-contained or even representations of possible people: They are often motivated by their role in thematic, symbolic, aesthetic, and other contexts (Jannidis, par.6; see also Phelan). The uncontested—and, quite plausible in the case of literary narratives—basis of these analyses is that characters and other such entities are parts of an authored environment that is not open to any significant variation on the level of these entities themselves. A similar take on such entities is adopted in transmedia studies' analyzing the ways in which “media characteristics” can be transferred or “transmediated” from one medium to another (Elleström 3). Here, I propose looking at characters as process-based, following Murray's description of computational objects as variables and Berry's discussion of digital mediation.

In terms of digital mediation, character exists “in a state of flux” (Lindgren Leavenworth 96) on two levels instead of just one.⁹ Where as users of legacy media we are, at least to some extent, able to freely construct and interpret the representation of a character, in computational media we can also manipulate the representation itself by using algorithms (see Berry 1–2). This forms the basis of a creative feedback loop, as our interpretations of a character may result in our editing and developing them according to our understanding of the general environment in which we are operating. In digital role-playing games, for example, the playable character can be considered the player's tool for answering the question “What should I do?” within the general setting of the game in accordance with certain goals, such as “winning,” “making up a dramatic story,” or “developing the character” (Roine, “How You Emerge”). In other words, the various functions and meanings of a character are defined by the current software-based environment and the agency with which we as users are endowed within it (see Manovich, *Software* 152)

While all contemporary media is not enforced by code, the understanding of entities like character as open-ended “tools” or patterns with multiple instantiations is becoming more and more pervasive. An illustrative example of this is provided by HBO's massively popular television series

Westworld (2016–), with its android characters, “hosts,” populating a technologically advanced Wild West-themed amusement park. Both the hosts and the park—an artificial but lifelike environment—have been designed according to various narrative prompts and templates with the goal of offering entertainment and escapism for the wealthy guests.¹⁰ After each day, the hosts begin their behavioral or “narrative” loops again. However, after a software update which unlocks access to old, supposedly purged, memories from host’s previous lives, hosts start showing signs of developing an understanding of who they are and what their world really is. This way, the hosts materialize not only the contemporary tendency to “repurpose” and “reuse” familiar characters but also critically lay out the process of claiming ownership over the park’s stories through remaking them. As Dolores, one of the main android characters in the series, finally becomes fully conscious, she also breaks out of her predetermined roles, such as the “damsel in distress” or, more generally, a woman who is the object of someone else’s actions and desires instead of being an agent in her own right. In other words, Dolores gains true agency when her actions fall into a reciprocal relationship with the environment around her, a role that has previously been reserved for the human guests for their quest to “become who they really are.”

After the digital turn, character retains its traditionally observed functions in the sense that in addition to the possibility of viewing a character as a representation of a possible person, it can also be viewed from thematic, symbolic, and aesthetic viewpoints. However, instead of being “constrained” within a finished work or a narrative text which endows it its various meanings (that are, of course, open to interpretations), character is now put to various kinds of uses by many users in many contexts. In this sense, the digital turn has openly dismantled the idea of a single, fixed canon—and brought the heated debates of whether a character, events, development, or such can be considered “canon” to the heart of contemporary culture even beyond fandoms, or self-identified fan cultures.¹¹ These debates range from protests against the new look of the Klingons in *Star Trek: Discovery* (2017–), the latest installment of the franchise, to the sexist and racist online abuse of

Kelly Marie Tran, the first woman of color to have a lead role in a *Star Wars* film, *The Last Jedi* (2017). Especially in the case of Tran, the realm of fiction becomes a battleground of all sorts for different, conflicting stories defining both culture and identity: whether a woman and a person of color could “qualify” as a major character instead of belonging to margins (see Tran). While the online abuse obviously is not a simple expression of debates concerning the fictional canon of the *Star Wars* franchise, the ongoing battles are manifested through it and its logic.

The socially embedded practices of spreading media content should, thus, be taken into account when discussing computational media and the question of what exactly is being expressed across multiple forms and media, as they form another kind of underlying pattern for the “singular performances.” Jenkins, Ford, and Green argue that as people engage with shared content, they often do not even primarily “think about what the producers might have meant but about what the people who shared it were trying to communicate” (13). Material gets remade as audiences “retrofit” it to better serve their interests, either literally sampling or remixing it, or figuratively inserting it into ongoing conversations, for example (27). In other words, the popularity of content can be understood in terms of the possibilities of repurposing and circulating it, and of putting it to various kinds of uses, which can vary from constructing one’s identity to criticizing the current political situation. In the narratological analysis of such practices, the approach to entities like characters as process-based and open-ended instead of as parts of a finished work within which they fulfill certain functions allows us to go more deeply into the interplay between a single instantiation and the archive of many possibilities—and ask quite profound questions. How and why are the entities such as characters reimagined and repurposed, and on whose terms?

Finally, I turn to the concept of *storyworld*. The acts of creating instantiations from a vast, spatial archive have been addressed through the concept of world especially in the study of transmedia. Lisbeth Klastrup and Susana Tosca coined the term “transmedial world” as early as 2004, thus

illustrating the overall tendency to consider the “fictional wholes” the transmedia users are engaged with to be worlds rather than texts. Mark J.P. Wolf sees worldbuilding as a contemporary mass-market phenomenon representing a major shift from the film or novel, as “imaginary worlds invite audience participation in the form of speculation and fantasies, which depend more on the fullness and richness of the world than on any particular storyline or character within it” (12). For her part, Ryan argues that the term “transmedia storytelling” is actually a misnomer, a better one being “transmedia worldbuilding” (“Transmedia Storytelling: Industry Buzzword” 4–5). All in all, as a construct that can intuitively be understood to be “larger” than a linear ordering of words on a page or the contents of a single work of fiction, a world—or, more specifically, storyworld—has been offered as a constituting center of transmedia.

The most prominent treatments of transmedia worldbuilding within narrative theory have outlined it either as a project of creating more documents and objects, which in turn “add substance” to the storyworld (Ryan, “Transmedia Storytelling: Industry Buzzword” 16), or as the author creating the storyworld—the center of the convergent media—through the production of signs, such that the user then uses the blueprint of a finished text to construct a mental image of this world (Ryan and Thon 3). However, substituting “storyworld” for “story” does not do away with the print- or text-based assumptions underlying the concept. In my view, the above approaches fail to account for the reciprocity that computational media can provide: the process of creating varied instantiations from the database or archive. New instantiations always add to the archive and thus rework it, potentially multiplying the perceived canon. In this, I put forward the concept of worldbuilding in addition to storyworld to describe the users’ agency within a particular environment in relation to an imaginative framework instead of a practice of “adding substance” to a construct expressed across multiple forms and media. In a manner similar to digital mediation, the understanding of what there is (e.g., an object stored as a representation) goes hand in hand with the

process of what there could or might be as a result of what is (e.g., through the manipulation using algorithms).¹²

In short, this is the pervasive, contemporary logic of using previously established elements in order to engage users in the imagining of new developments and installments; this is evident in the prominence of the concept of “universe” in transmedia studies. In many discussions, transmedial worlds are thus viewed as concretizations of the economic logic where characters and stories can repeatedly be exploited, while elements such as memorable characters support their own production lines (Jenkins 116–17; on a “supersystem of entertainment” see also Kinder). However, worldbuilding is not only about arranging or repeatedly exploiting content but also about communicating new ideas and interpretations within the transmedial context. The process of using “what there is” to reach out for “what there could be as a result” is an open-ended performance, where any of the objects or entities can be reworked, reimagined, or remixed at any time. It is worth noting that both officially produced, “canonical” works and fan-made, “fanonical” works similarly make use of the doubled understanding of what there is and what there could or might be as a result of our manipulations and “retrofits” (see Jenkins, Ford and Green 27). Thus, we should not impose any clear-cut boundaries between interactivity (or reciprocity) in general and “behaviors that make up participatory culture,” as Ryan does in her recent revisiting of the 2001 classic *Narrative as Virtual Reality* (162).

The approach of this kind also helps remedy a problem that many theories of transmedia suffer from; as Thon notes, they base the analysis of transmedial franchises’ representational functions on the assumption that they would represent a “single world” (“Converging Worlds” 24). Once again, the idea of a single world brings up the underlying assumption of fixed content, which, furthermore, has contributed to the view that transmedia simply means redundant representations of the same elements over and over. In many transmedial franchises, which—database-like—can accommodate material indefinitely, the situation is quite the contrary, as new interpretations and

instantiations or content are constantly created. This is well illustrated by the science fiction television series *Battlestar Galactica* (2003–2009), a reimagining of a 1978 series by the same name, where one of the main characters, the fighter pilot Starbuck, was rewritten as female. However, the template of a cocky, insubordinate, card-playing flirt was retained, resulting in an even more successful instantiation of the character. The series' antagonists, the Cylons, were also rewritten in two important ways: In the reimagined series, they were created by humans instead of advanced aliens, and, furthermore, they made a conscious decision to model themselves after twelve human forms.

Together, the two rewriting decisions make all the difference in the way the Cylons are employed in the series and how they appear. They gain additional importance through the comparison to the “original” instantiations of the characters within the transmedial franchise of *Battlestar Galactica*. In addition to rewriting or remaking, elements which are already familiar to users can be recontextualized. In the reimagined *Battlestar Galactica*, two television films, *Razor* (2007) and *The Plan* (2009) engage in such recontextualization, as the former provides a new context for the ruthless actions of Admiral Helena Cain while the latter offers the rationale for both the original Cylon attack on the human colonies and their subsequent change of heart. Instead of recontextualizations, the two television films might be called expansions, designed to tell us more about certain characters, events, or aspects in the series (see Thon, “Converging Worlds” 33), but such expansions can *modify* our views on the characters and thus serve rhetorical purposes as well.

I would argue that the various processes of reimagining, repurposing, and remixing enabled by computational media largely explain the popularity of transmedia today. Ryan has focused on the same question of popularity and ponders whether “the difficulty of justifying the distribution of narrative information over many delivery systems” provides an answer to the question of why there are no transmedia hits, only projects that “became” transmedia (“Transmedia Storytelling: An Industry Buzzword” 16–17). This view does not, however, take notice of the move from the model

of distribution towards that of circulation, as the emphasis shifts away from content towards performances. Rather than waiting for top-down designed “hits” to happen, current transmedia is created bottom-up in both canonical and fanonical contexts. In the end, the understanding of transmedia as a designer-controlled, single, “large” narrative (or storyworld) distributed onto various platforms is getting outdated. More and more effort is invested in managing and circulating the material—and in various other activities surrounding what previously has been conceptualized as text. Transmedia hits might therefore better be understood not as a carefully designed narrative or storyworld across media but as an environment that engages the users in reciprocal action to share and communicate their ideas and interpretations. The understanding of worldbuilding as a similarly reciprocal practice offers us both an imaginative and analytical framework for modelling these engagements.

CONCLUSIONS

In summary, I believe that narrative theory can truly contribute to the study of storytelling practices and strategies in computational media in dialogue with, for instance, the fields of software studies, game studies, and digital humanities. This way, we are directed towards a multidisciplinary hybridization instead of the future fragmentation anticipated by McHale (302). If we are to leave the print- and content-based biases behind, I see that more emphasis might be put on two ideas: firstly, authorship as design, and secondly, users’ performative acts. As this article has argued, in computational media authorship lies within the design of processes and structures which then invite and enable users to perform the more particular patterns of meaning themselves. Compared with earlier media of representation, the code-enforced, procedural nature of the computer places users’ interpretative work in a reciprocal relationship with their ability to manage, define, and manipulate representations. When we understand this, we can also gain a better understanding of how, for instance, various meanings get communicated by means of storytelling in computational media. The

social and political implications of this are significant, as my discussion on repurposing and reimagining these entities showed. In the end, the study of the ancient technology of storytelling within a computational environment allows us to examine the transformative effect of technologies on the way we see the world and engage with it as part of our everyday lives.

Notes

1. While I acknowledge the fact that platforms and user interfaces come in all shapes and sizes, in this article I use “the computer” as an umbrella term to refer to the general properties and affordances of all computational media.
2. Yet another viewpoint on the phenomenon of convergence is the conglomeration of media owners. Through this corporate convergence, media companies have learned “how to accelerate the flow of media content across delivery channels to expand revenue opportunities, broaden markets and reinforce viewer commitments” (Jenkins 18).
3. The divide between physical and computational media is not clear-cut, of course, as computers have their physical and material forms, too (see e.g., Kirschenbaum on materiality of the computer).
4. *Merriam-Webster*, for instance, provides this definition of database: “a usually large collection of data organized especially for rapid search and retrieval (as by a computer).” See <https://www.merriam-webster.com/dictionary/database>.
5. For this reason, the concept of emergent narrative has been discussed in relation to digital games. Richard Walsh has argued that genuinely emergent narrative is possible in role-playing games, but only if the player maintains the duality of their performance: “playing a role must be simultaneously action and communication—behavior as representation” (“Emergent Narrative” 82). The duality of performance in the computational environment is perhaps not as obvious a phenomenon as observing people engaged in face-to-face role-play, but it is nevertheless crucial. The computer’s codified rendering of responsive behaviors is, in a sense, a very concrete example of behavior as representation.
6. In addition to productive interactivity, Ryan discusses external and internal types of interactivity (“Transmedia Storytelling: Industry Buzzword” 11). According to her, external interactivity is an inherent property of databases, as it consists of the freedom to make choices between documents presented by a system to the user. For its part, internal interactivity is inherent to some of the

documents of a transmedia system; in it, the user's mode of participation is narrowly scripted by the system (e.g., in video games, where users are told to play the role of a certain character). In *Narrative as Virtual Reality 2*, Ryan proposes an even more detailed taxonomy of interactive devices that relies on dichotomies between internal and external, and ontological and exploratory (162–65).

7. It should be noted, though, that narrative (however elemental for human thinking it may be) is not the sole way to create meaning by discerning complex states, connections, and relations. Other operations include, among others, spatial, abstract, systemic, and haptic ones (see Walsh, “Ruminations” 263; Roine, *Imaginative* 84).

8. I have further discussed the nature of role-playing characters within the frame of narrative theory in my article on the digital role-playing game series *The Mass Effect Trilogy* (Roine, “How You Emerge”).

9. According to Maria Lindgren Leavenworth, meaning is always in a state of flux as the point of departure in fan fiction writing is the concept of archive: “Each addition to the archive adds new associations to it that later interpreters may be influenced by, and a productive chaos is upheld” (96). For her part, Abigail Derecho has famously suggested seeing fan fiction as an archontic text and its “archive [as] a virtual construct surrounding the text, including it and all texts related to it” (65).

10. Interestingly, *Westworld* has extended this experience to the viewers through various transmedia expansions. The most immersive ones are “virtual reality events” such as “Live Without Limits,” which took place during SXSW festival in Austin, Texas in March 2018. In the event, the town of Sweetwater, one of the main locations in *Westworld*, was constructed along with the infrastructure for the guests to enter the theme park. Therefore, people could “really” enter *Westworld*, starting with the choice of their outfit and weapons, then interacting with the actors playing hosts and so on. While such events obviously are a form of marketing, devised to create hype around the series, in

this case they also have a potential to strengthen the user's experience of being a human, a visitor, an outsider (and exploiter) to *Westworld*.

11. From the Jane Austen and Arthur Conan Doyle fandoms in the 1920s, fan fiction—which is, incidentally, often character-centric—has used the established elements of a source (in any media) as a basis to create new stories and scenarios within a fandom (see Derecho 62). These can then be used for multiple purposes that can differ from the ones of canonical works: For example, works of fan fiction can be employed for subversive purposes when alternative, communally established readings are used to highlight hegemonic interpretations which often go unnoticed (Roine, *Imaginative* 216).

12. Jason Mittell has suggested distinguishing between two larger tendencies of transmedia storytelling in similar terms. These are “what is” transmedia, which seeks to extend a fiction canonically and to expand the user's understanding of a world, and “what if” transmedia, which poses hypothetical possibilities rather than canonical certainties and invites users to imagine alternatives that are “distinctly not to be treated as potential canon” (314). While Mittell's approach certainly shares some features with mine, I do not wish to separate canonical from non-canonical in this manner when it comes to transmedia.

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