Considering Authorial Liberty in Adaptive Interactive Narratives

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Abstract. This article addresses the question of how much freedom an author (or a system) could be given to adapt a narrative in real-time to a potential recipient (i.e. the degrees of freedom of the author/system). While one focus in current research on adaptive storytelling is automation using artificial intelligence, we argue that the core concept of adaptive storytelling needs further development before it can be suitably implemented in an automated system. As such, we present the idea of the *Authorial Liberty Continuum*, as an authoring tool to help specify the degrees, and form, of adaptability to be provided to an Author (be it a person or a system) of a given adaptive narrative. The continuum ranges from a very limited freedom (e.g. very deterministic possibilities of change – resembling the capabilities of a drama manager), to full freedom (e.g. full control to adapt everything – resembling the power of a game master).

To explore the capabilities of this model as a framework for designing adaptive real-time interactive narratives, an exemplary system of such has been implemented, which allows a human agent (aka the *Author*) to insert elements into the experience in real-time, and thus execute small changes to the narrative. This working novel prototype showed that the perception of the events in an adaptive real-time interactive narrative varies from the real-time Author to the Recipient. This makes it difficult to foresee which elements an Author should be able to adapt, to attain a specific position on the continuum. We believe that these results warrant further exploration of the *Authorial Liberty Continuum*, in order to determine how varying points on this continuum might be classified.

Keywords: Adaptive storyworlds · Adaptive storytelling · Adaptive · Real-time · Interactive · Narrative · Digital narrative · Narratology · Narrative theory · Drama manager · Game master · Authorial liberty continuum · Events

1 Introduction

Within the field of interactive digital storytelling, a recurring theme is the idea of adaptive storytelling or adaptive storyworlds [1–4]. The concept has been approached from many different angles but is still at an incipient stage.

The present article seeks to contribute to this emerging line of research, by addressing the question of how much control and/or freedom an author (or a system) could be given for seamlessly interacting with (i.e., adapting) the narrative in real-time to a potential recipient (i.e. the degrees of freedom of the author/system).

In recent years, one dimension of the research, have been toward the automation of digital storytelling through AI-driven approaches like automated virtual story generators, adaptive storytellers and intelligent narrative generators [4, 5]. In the present study we acknowledge the potential of using artificial intelligence for adaptive storytelling, as for example when addressing the combinatorial explosion in "traditional" branching structures [6]. However, we argue, that to move forward in this line of research for adaptive narrative systems, the core concept of adaptive storytelling needs further development before it can find suitable implementations in fully automated systems.

This article therefore presents the idea of *degrees of authorial freedom*, to explore the extent to which an author can adapt the narrative in real-time, as a framework for designing adaptive real-time interactive narratives. From these theoretical considerations, we have implemented an exemplary system of an adaptive interactive narrative, to explore the capabilities of the framework for designing adaptive real-time interactive narratives and illustrate the workings of what we call the *Authorial Liberty Continuum* (Fig. 1). The novel prototype affords a human agent (aka the *Author*) the capabilities to define elements of the narrative in real-time, and thus execute small changes to the storyworld, and thus, potentially, to the perceived narrative.

2   Designing for Adaptation

The rather recent advances in computational power and high-speed internet, have advanced the idea of adaptive narratives from pure theory into more mainstream practice. For example, the fairly recent Netflix series "Black Mirror: Bandersnatch" [7] can be regarded as a simple, and somewhat crude, attempt to create a cinematic interactive narrative, which adapts based on user input. These forms of narrative are nevertheless still in their infancy, and there are no clear guidelines when designing for adaptive formats. Therefore, we believe that the unique features and methods for adaptive narratives are yet to be developed.

2.1   Authorial Liberty Continuum

We suggest that the "adaptiveness" of an adaptive real-time interactive narrative, can be placed on a continuum defining the degrees of authorial freedom to adapt the narrative in real-time. We refer to this as the *Authorial Liberty Continuum* (Fig. 1). The continuum ranges from very deterministic possibilities (*Drama Manager)* to full creative freedom (*Game Master*). The two poles of the continuum are considered as two extremes (no freedom vs. total freedom) in terms of what – and how much – the Author may change (i.e. the way the Author can control the narrative, and the storyworld).

We refer to the seminal definition of *Drama Manager* by Mateas and Stern [8], who describe the drama manager as being allowed to create intractable, rich, branched stories. Drama managers (in interactive digital narratives) are usually systems that detect

Drama Manager   **Game Master**

←————————————————————————————————→

Limited control   Full control
Fixed Story   Story can be adapted
Narrative discourse can be adapted   Narrative discourse can be adapted
Restricted capacity for manipulation   All elements can be manipulated

Fig. 1. *Authorial Liberty Continuum.*

happenings in a storyworld and, if needed, send a one-sided, narrow-bandwidth request to intelligent agents [8]. These requests change the behavior of the intelligent agents in order to achieve the next step in the plot. It is important to mention that in this case the communication between drama managers and agents is infrequent, allowing the latter to maintain the character-state and make *"moment-by-moment behavior decisions"* without further input from the drama manager [8]. It also needs to be noted that the term *agents* may be interpreted as both *events* as well as *characters*.

Drama managers are not given the power to change any rules in the storyworld, but work *by* the rules, and have no power to adapt the narrative outside pre-scripted scenarios. Hence, we regard *Drama Manager* as one of the extremes of the *Authorial Liberty Continuum*. By placing the Author at this extreme, the Author should only be given the ability to change the narrative discourse, but not altering the story.

At the other end of the continuum we place the *Game Master*. Tychsen et al. [9], define a set of tools and functions, similar to those of a game master in role-playing-games like "Dungeons and Dragons". They divide the functions of the game master toolkit into five groups: narrative flow, rules, engagement, environment and virtual world [9]. These groups are embracing the idea of full control of the narrative in terms of narrative beats, as well as rules of the world and the game, even how the player is engaged in the action. Based on this, we define the opposite end of the continuum as the *Game Master*. Placing an Author at this extreme, means that the Author has complete control over the narrative, and can influence all of its aspects (including discourse and the story itself).

A known issue with interactive narratives is the dilemma of providing user agency (e.g. freedom of movement and freedom of choice) while maintaining control of the narrative intelligibility [10–12]. We argue that this would still be a problem in an adaptive real-time interactive narrative, due to its interactive nature. The audience's interpretation of the author's story can go beyond what the author intended to tell, and hence, the audience can be considered as a co-author. This relates to Roland Barthes' notion of the "writerly text", as he argues that a narrative can be "co-created" by both the author and the reader, as the reader interprets the narrative discourse of the author (i.e. the words or visual representations) and constructs his own narrative from this [12, 13]. Thus, the quality of storytelling will depend on both parties - not only the author - as the audience needs to ratify what is presented [14].

Depending on the intentions of the author or designer, the different ends of the spectrum can be more or less favorable. For example, when the author has a specific message to convey, a more *didascalic* [12] (i.e. figuratively) narrative is favorable, and as such a position on the continuum towards the *Drama Manager*. However, if the intention is exploration or agency through interaction, then the user will have to rely more on their

own perception of the narrative and make up their own story, creating a more abstract, or open, narrative. Hereby the Author-Audience Distance will be greater, meaning that there will be an interpretation gap between what the author intended to tell, and the narrative that the audience perceived [12]. This could allow for more freedom to adapt without breaking a specific narrative, meaning a position on the continuum towards Game Master can potentially be preferable.

As such we believe that the *Authorial Liberty Continuum* can aid designers in making decisions about the amount, and the kind, of adaptability to be provided to the author/system in order to achieve a given level of narrative intelligibility.

3 Designing with the Authorial Liberty Continuum

In order to experiment with the potential of utilizing the *Authorial Freedom Continuum* (Fig. 1) as a framework for designing an adaptive real-time interactive narrative, we designed and implemented a prototype. The prototype aimed to place the Author somewhere between the two extremes of the continuum, but tending towards the *Drama Manager* side, in order to somehow constrain the possibilities of the Author, in an attempt to guarantee some form of narrative intelligibility.

In our implementation of an adaptive real-time interactive narrative, one user is given the role as the Author and is tasked with conveying a small pre-written narrative (through environmental storytelling) using a phone application, specifically developed for this purpose (Fig. 2). The phone application gives the Author the ability to insert various 3D objects and toggle various effects in real-time. Furthermore, it shows the real-time location of the Player in the scene. The role of the Player is to explore the narrative through an interactive environment on a PC. During this, the Player experiences how the Author orchestrates the events in real-time (Fig. 3), all the while being unaware of the existence of the real-time Author and his influence on the events.

The pre-constructed setting of the narrative is a World War II bunker, hinting to the planning of the nuclear bombing of Japan. The scene is constructed to be able to communicate the narrative through environmental storytelling, without the interference of the Author, as we inserted American propaganda posters, as well as allusions to Oppenheimer through writings on a black board and other props. The Author, however, is able to insert further clues such as models of atomic bombs, blueprints, and a world map with emphasis on Japan.

As we placed the Author closer to a *Drama Manager* than to a *Game Master* on the continuum, we predefined which objects and effects the Author is granted, and we also preconstructed the general setting. However, the Author is given some degree of freedom, by being allowed to use whatever item or effect at their disposal at any time.

3.1 Evaluation of Event Perception

In order to assess whether the Recipients' perception of the nature of the available events matched the Authors' perception, we conducted a test, consisting of 10 Author/Recipient couples, randomly recruited university students through convenience sampling. After the Recipients and the Authors had tried their respective applications, they were tasked
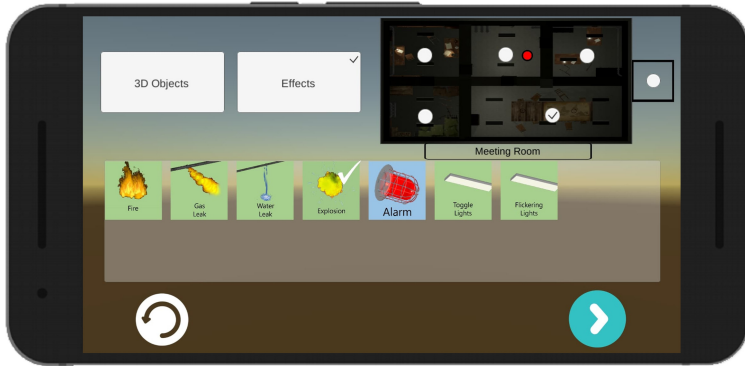
Fig. 2. User interface of Author application running on smartphone

with categorizing the different events and objects deployed by the Authors into the narrative. The categories labelled the events as either *constituent events* (i.e. affecting the understanding of the *story*) or *supplementary events* (i.e. only affecting the *narrative discourse*), following the distinctions made by Roland Barthes and Seymour Chatman [15].

The results from the tests showed that the Recipients mainly classified the events as *supplementary events* (58%), i.e. as not affecting their understanding of the story, and thus mainly affecting the narrative discourse.

The Authors on the other hand, mainly classified the events as *constituent events* (65%), i.e. affecting the understanding of the story, and thus in effect, changing the story as the events were deployed.

Fig. 3. Recipient's view in prototype

4   Discussion

We initially expected that the Authors would categorize events and objects as *supplementary events* (mostly changing the narrative discourse), as they would have knowledge of a story that they should try to convey, and thus concluding that the events they deployed would only change the discourse. On the flip side we believed that the Recipients would classify the events as *constituent events*. Since the Recipients would have no prior knowledge of a pre-written story, we believed they would experience all events as defining for whatever story they constructed themselves from the experience. However, our test showed the complete opposite, i.e. that Authors mainly considered the events as *constituent events* (important to the story, and thus changing the story), and the Recipients mainly considered the events as *supplementary events* (not important to the story, and only changing the narrative discourse).

The Authors' classification can potentially be linked to the fact that the Authors described themselves as omnipotent or all-knowing entities in the experience (similar to zero-focalization [16]). This could imply that the real-time aspect of the experience, gave the Authors a feeling of being a participant in the story world, rather than just creating it (i.e. being a focalizing point in the narrative).

The Recipients' perception of the events as primarily *supplementary events* could suggest that the Recipients experienced the general setting as sufficiently conveying the story through the environment, and as such not regarding the influence of the real-time Author as changing the story. However, since the Recipients were unaware of the presence of the real-time author, the classifications of the Recipients could also suggest, that the deployed elements where perceived by the Recipients as pre-programmed part of the narrative experience and thus not as elements which could be said to change anything. Some Recipients did also explain that they believed the events were simply triggered by their own movements in the virtual space.

The specific placement of the Author within the *Authorial Liberty Continuum* could also play an important role in the results, and relates to the general question of how an adaptive real-time interactive narrative could be affected by placing the Author at varying positions on the continuum.

Moving the Author towards the Drama Manager side of the *continuum* would mean less freedom (i.e. less – and more restricted – functionality for the real-time Author to alter the narrative). When designing an adaptive real-time interactive narrative with a degree of authorial freedom around this end of the continuum, the focus should then be on designing adaptive elements which solely compliments the story, but do not affect the recognition of the story, as it is intended by the designers. A simple example could be changing the look of a character based on some form of user input, without changing the role of the character, and thus still providing the same conclusion to the story. However, the results of our study open the issue of how to understand at what point an adaptation is actually changing the *story*. As we have shown, it can be difficult for a designer to foresee, which elements in an adaptive real-time interactive narrative are interpreted as *constituent* or *supplementary events*. It might even be argued that at a certain point, enough supplementary events could potentially affect the story and thus be regarded – as a whole – as constituent events.

On the other hand, placing the Author more towards the Game Master side of the continuum means <u>more</u> freedom (i.e. <u>more</u> options to change the narrative). Thus, an adaptive real-time interactive narrative around this end of the continuum should be designed to allow the Author to adapt almost any part of the narrative experience. The questionnaire showed, that the Authors in our approach, wanted to have more freedom, in the form of more objects, and additional functionality, to change in real-time, even though they felt confident that they were able to convey the story using the elements which were provided in our approach (i.e. the provided degree of freedom). However, depending on the goal of the adaptive real-time interactive narrative, we believe that this could be problematic from the perspective of the *Author-Audience Distance* [12], as more possibilities would likewise demand more of the real-time Authors and their ability to manage these added possibilities while trying to convey a coherent narrative. This, additionally, raises the question of when the degree of freedom becomes so great that it cannot be regarded as *adaptation* anymore, but merely is *creation.*

5   Conclusion/Future Works

In this paper we introduced the *Authorial Liberty Continuum*, as a way to describe the degrees of freedom given to a real-time author in an adaptive real-time interactive narrative. To explore the model, an adaptive real-time interactive narrative was implemented, in which a human real-time author was given the freedom to adapt the narrative, by deploying different pre-defined events in the scene. As such, the Author was placed towards the Drama-Manager side of the continuum. During the evaluation of the framework, Authors and Recipients were asked to classify events. The results showed that Authors tended to classify objects mostly as *constituent events*, and Recipients mostly classified the events as *supplementary events.* Taking this into consideration, another interesting topic for research could be to investigate what kind of elements the Authors would prefer to alter during the playthrough. Our approach provided only three types of tools: 3D objects, Auditory- and Visual-Effects. Also, the variation of options for the real-time Author would be an interesting topic to dig into, as it could potentially show the optimal author placement on the continuum, depending on the goal of the adaptive real-time interactive narrative.

It could also be of interest to compare adaptive real-time interactive narratives generated from both human authors and artificial intelligent (AI) solutions, in order to see how the stories would be perceived, and if they would be perceived differently by the Recipients. This comparison would be interesting as we believe that most of the pre-existing research is focused on procedurally generated narrative solutions [17] rather than human-based digital solutions.

We argue that the more we experiment with human authors at different levels of freedom on the Authorial Liberty Continuum, the more we learn of how a human author might adapt a narrative, based on the amount of freedom given. Knowledge that we perceive as imperative, if we ever want to design a credible AI for adaptive narratives.

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