

Rereading in Interactive Stories: Constraints on Agency and Procedural Variation

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Abstract. A central problem for interactive storytelling research is how to create a story which procedurally varies as the result of a user's actions, while still feeling like a story. Research has largely concentrated on how to provide coherent variations *each time* a user experiences an interactive story, without consideration for the relationship *between* subsequent experiences. This paper examines the issues that arise when designing an interactive story system which is intended to be *reread* as the result of a *reframing*. Through a discussion of several types of reframing drawn from non-interactive films, we argue that, when an interactive story makes use of a reframing to encourage rereading, the requirements for narrative coherence, selection and ordering extend *across* reading sessions. This introduces constraints in terms of what can be varied procedurally in response to user actions which do not occur in interactive stories which are not explicitly designed to be reread.

Key words: interactive storytelling, rereading, constraints, agency, procedural variation, reframing, coherence, selection, ordering

1 Introduction

Currently, most interactive storytelling systems try to support one or more of the following aesthetic categories, as first articulated by Murray [1]: agency, immersion, and transformation. Most interactive storytelling research aims to provide a sense of *agency*: the feeling that you are able to form an intention, take action within the storyworld to pursue that intention, and see your action have an impact on the unfolding events in the story. Transformation, however, particularly what Murray calls *transformation as variety*, is more problematic.

Transformation as variety requires that the reader can re-experience a story multiple times to see different aspects of the story. Mateas [2] suggests that there is, at first glance, an apparent contradiction between agency and transformation as variety. Agency requires a clear plot structure, a structure which may be disrupted by transformation as variety, resulting in a disruption of agency. However, without transformation as variety, a reader who re-experiences a story will quickly realize that their actions have no consequence, and again agency is disrupted. Agency seems to require that transformation as variety be both present and absent at the same time.

Mateas argues that the way to overcome this apparent contradiction is for the system to enforce a dramatically meaningful but *different* plot in every variation. This raises the question: how can systems maintain narrative coherence while providing variation in the context of rereading?

2 Related Work

There are two ways in which research has addressed this question. One approach is to customize each interactive story experience to a specific *reader* – making sure that each individual reader’s choices have an impact on the resulting experience. This is essentially providing variation *across readers*. This is the approach taken by most systems [3–5]. The second approach is to customize the experience to a specific *reading* – making sure that a given reader’s choices in each individual reading have an impact on the resulting experience. This is essentially providing variation *across readings*, potentially by the same reader. Although some authors [6] state that repeated experiences by the same reader is one of their design goals, they do not make use of the fact that the reader is the same.

3 Research Problem

For an interactive story that is designed to create a sense of agency and transformation as variety, the requirement is that coherence be maintained *within each instance* of the story in isolation, even when a user re-experiences the story.

Consider, instead, an interactive story which is designed specifically to motivate *rereading*, and is intended to do so by means of a *reframing*. By reframing, we mean the revelation of new information at the end of the initial reading which fundamentally changes the reader’s understanding of the story, and motivates the reader to go back and reread the story to look again at specific parts of the story related to this new perspective. For example, in the film *The Sixth Sense*, the revelation at the end of the film that the main character, Malcolm, has been dead for most of the film radically changes the viewer’s understanding of the story, and in most cases creates an urge to re-watch the film [7].

Now consider a version of *The Sixth Sense* designed as an interactive story. If the reader/viewer is going back to re-experience the work with the specific goal of seeing, again, what they saw the first time, any change to the story which removes or changes those aspects of the story which the viewer is looking for will frustrate and disappoint the viewer. For example, the viewer may want to see why they didn’t notice that Malcolm is dead. If the scenes that the viewer is looking for are either missing or different, they will feel frustrated.

This suggests that there are additional and different constraints on which aspects of the system can vary procedurally when the story is intended to be re-experienced as the result of a reframing. The current work on interactive storytelling, by focusing on maintaining coherence within individual experiences of an interactive story, does not address this problem (although, see [8]). In this paper, we focus on the question: what issues arise when we want to create stories

that change based on reader choices, while at the same time taking into account what the reader knows when rereading as the result of a reframing?

4 Requirements to Support Rereading

We will now discuss how the intention to support rereading as the result of a reframing impacts agency and procedural variation within an interactive story. In this situation, the requirements for *coherence* are extended across reading sessions, and additional constraints are imposed in terms of *selection* and *ordering* both within and across sessions.

4.1 Coherence

The requirement for coherence means that “[n]arrative existents must remain the same from one event to the next. If they do not, some explanation . . . must occur” [9, p. 30]. For an interactive story where rereading is motivated by reframing, there are additional constraints imposed on coherence, not just within but also *across* readings.

Consider our scenario where a viewer is (re)watching an interactive version of *The Sixth Sense*. In this example, it is crucial that the events which the reader encounters in the first reading remain the same in subsequent readings. If the reader’s actions during a second reading of the story lead to Malcolm *not* dying, or result in him discovering that he is dead much earlier in the story, then it is quite likely that the reader will not be able to re-experience the events which she was motivated to see again as a result of the reframing. This suggests that, for rereading motivated by reframing, coherence enforced within an individual reading may not be enough. If the reader is looking for something in particular, and that changes, then the reader’s motivation for rereading will be frustrated.

Similarly, in the film *Vantage Point*, we are shown a series of variations on the attempted assassination of the American president, each from the perspective of a new character. Each version adds new information about the events, and puts our initial interpretation of earlier events in question, while at the same time maintaining coherence. Viewers are motivated to continue watching out of a desire to “figure out what really happened”, as each version reframes the narrative and invalidates their previous understanding. In an interactive version of the film, if the user was able to take action which contradicts earlier versions, such as stopping the assassination attempt, then this motivation disappears.

The structure of *Vantage Point* suggests an additional constraint on variability for an interactive version of the film. In each variation of the story, the viewer receives changing information not just about the events in the story, but also about the roles and identities of the various characters, some of whom were the focus of earlier versions of the story. In order for these revelations to be effective, a player in an interactive version would have to be restricted in terms of the “obvious things” she might want to do to or with such characters. This places restrictions on user actions, not just based on events that have already happened, but on revelations that have *not yet happened*.

4.2 Selection

The above discussion involves constraints that are placed on an interactive story in terms of coherence across reading sessions. There are also constraints in terms of what must be shown, and what can be omitted, during rereading. This can be seen as a constraint on *selection* – determining what is to actually be shown, and what will be left for the reader to infer [9] – across readings. Stories often omit scenes which are not directly important to the story, such as the time spent for a character to travel from one location to another. Stories also tend to omit details of scenes when the scene is being shown again.

If a reader is going back to a story a second time and is *looking for something in particular*, then if what the reader is looking for is not there during the rereading, her reason for going back will not be satisfied. Coming back to our *Sixth Sense* example, even if the events of the story remain consistent and coherent (i.e., Malcolm dies and moves through the story thinking that he is alive), the reader could still find the rewatching dissatisfying if *what they want to see* is not shown. When a viewer sees the final scene in the film, she is most likely going to want to go back and look for any scenes where Malcolm was seen together with people other than Cole, to look carefully at these scenes and wonder how she didn't notice that Malcolm was dead. If these scenes are omitted from the second viewing, it is likely that the viewer will feel frustrated. What this means is that the system must take into account both *what the reader knows about the story* and *what the reader is looking for* in subsequent readings, and ensure that these scenes are not omitted.

Similarly, in the film *Inception*, the final scene introduces a reframing of sorts. Rather than completely altering the viewer's understanding of the story, instead the end of the film *casts doubt* on the viewer's interpretation, leaving the viewer wondering whether or not the main character, Cobb, has actually returned to the real world, or is still trapped in "limbo". At this point, viewers are motivated to go back and rewatch the film, in an attempt to find evidence for their interpretation of the ending. Viewers will be looking for specific scenes which can be used to support their interpretation, such as the transitions between "levels" in the dream sequences, the various times that Cobb uses his spinning top to check if he is in reality or not, or the various times that his children are shown. If, in an interactive version of *Inception*, these scenes are not present in a rewatching, the viewer will be frustrated and disappointed. This is quite different from an interactive story which supports both agency and transformation as variety, where there is no explicit relationship between what is shown in one reading and what is shown or omitted in later readings.

4.3 Ordering

In a story which is using a reframing, it is crucial that the information which reframes the story be revealed to the reader *in the first reading*. If not, then the motivation to reread will not be present. This imposes an *ordering* constraint on the fragments of the story across reading sessions.

For example, for an interactive version of *The Sixth Sense* to effectively motivate the reader to return for the purposes of following up on a reframing, the reader must actually encounter that specific ending in the first reading. If the film ended without the final scene, the reader would most likely assume that Malcolm had successfully helped Cole overcome his problem of seeing dead people, and that, having dealt with this, he may be able to resolve the estrangement between himself and his wife. It is only upon seeing the final scene that the reframing forces the viewer to reassess the entire narrative, and consequently want to go back to resolve the ensuing questions.

A similar degree of constraint can be seen in some “multiform” stories. For example, the film *Rashomon* tells the story of the death of a samurai and the rape of his wife by a bandit in a forest grove. The story is told from four different perspectives: that of the bandit, the wife, the dead samurai (through a medium), and a woodcutter who came across the scene. Each version of the story deliberately contradicts the previous version, leading the viewer to eventually doubt whether there is any way to know what “really” happened. The order of the versions is important, as each is designed to play off the impression given by the previous. For example, the woman is shown to be encouraging the men to fight in the first version, whereas she wants to die as a result of her ordeal in the second. The impact of the reversals would not be the same if, in an interactive version of *Rashomon*, the order could be changed. In particular, the final version, told by the woodcutter, undercuts all three previous versions. While it may be possible for the first three versions to be reordered, the final version *must* come last. The order in which variations are encountered is important. An interactive version of the film which aims to preserve the impact of the variations would need to impose constraints on ordering *across* sessions for this to be effective.

In addition, designing an interactive story to encourage rereading as the result of reframing also imposes constraints on the ordering of events *within* the first reading. The structure of a narrative which involves a reframing is somewhat similar to a mystery or detective story. There is, however, a key difference. Whereas in a mystery the discourse is carefully constructed such that the reader should have just enough information to solve the mystery, in a story with a reframing, the very *existence* of the mystery is kept from the reader [7, p. 56].

Once the reframing has been revealed, the reader will realize that there were actually two versions of the discourse: what she initially thought was happening, and what has now been revealed by the reframing. If, however, the reframing is revealed too early, then the reframing will be rendered ineffective. For the reframing to have the type of wide-ranging impact seen in *The Sixth Sense*, where the information revealed in the reframing reaches back and changes almost everything in the narrative, it is also important that the event which the reframing changes (in this case the shooting and death of Malcolm) comes early in the story. There must be sufficient narrative distance between the reframed event and the reframing. This ensures that the reader is only able to reconcile the reframing by actually re-experiencing the story, rather than resolving the two conflicting discourses by simply thinking through the events of the story. This

implies that the system must ensure that there are constraints on the ordering of events within each reading of the story, at least for the first reading.

5 Conclusion

In this paper, we discussed the issues that arise when an author wants to create a rereadable interactive story, where the rereading is motivated by a reframing. Most interactive storytelling research focuses on creating procedurally variable interactive stories which provide a sense of agency, and adapt, in isolation, to each reader’s experience. When considering rereading motivated by reframing, however, authors need to think about how their story can adapt to repeated readings by the same reader, while taking into consideration what the reader has learned from previous readings.

The main difference between interactive stories that support rereading as a way to explore multiple outcomes or perspectives, and those that are intended to support rereading motivated by reframing, is that the latter approach imposes additional constraints on coherence, selection and ordering – not just within, but also across story sessions. Investigating the issues surrounding rereadable interactive stories motivated by reframing raises a number of issues which are not addressed by the current research, issues which can provide further insight into interactive storytelling in general.

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