StorySpinner: Controlling Narrative Pace in Hyperfiction

Clare J. Hooper
Intelligence, Agents, Multimedia Group
University of Southampton, UK

cjh302@ecs.soton.ac.uk

Mark J. Weal
Intelligence, Agents, Multimedia Group,
University of Southampton, UK
+44 (0) 23 8059 4059

mjw@ecs.soton.ac.uk

ABSTRACT

This paper describes the StorySpinner system, a sculptural hypertext reader used as a test bed for experimenting with the authoring of narrative flow in automatically generated stories. An overview of the system is presented along with discussion and conclusions arising from initial user trials.

Categories and Subject Descriptors

H.5.4 [Hypertext/Hypermedia]: Architectures

Keywords

Hyperfiction, narratology, sculptural hypertext, authoring.

1. INTRODUCTION

The StorySpinner system generates narratives based upon symbols selected by users, allowing them to read stories and explore hypertext in a novel fashion.

The idea comes from the novel 'The Castle of Crossed Destinies' by Italo Calvino [4]. In the novel, the narrator arrives at a castle inside which no-one is able to speak. To communicate their stories the other travellers use tarot cards, with the symbols on the cards representing events and characters in their tale. The narrator interprets the tarot cards forming the particular story of each traveller.

StorySpinner follows the sculptural hypertext model of authoring; here, nodes are initially scoped by their available connections to cards through interpretations. As cards are played, connections are effectively removed from the possible readings [1]. Metadata attached to the nodes allows the author to control the pacing of the narrative.

Readers generate a story by selecting tarot cards from an available set and the StorySpinner engine generates a narrative based on a set of pre-authored nodes and possible interpretations of the particular tarot card. The next section discusses StorySpinner in more detail. Issues surrounding the authoring of narrative flow were investigated and results, observations and conclusions from initial user trials form the remainder of this paper.

2. THE STORYSPINNER ENGINE

Readers are presented with a set of 22 tarot cards, and during the reading choose a sequence: the generated tale is based upon interpretations of this sequence, with early cards affecting the meaning of later ones; different card sequences generate different stories.

The 22 cards each have 10 to 15 possible interpretations from a set of just over 200. These are used as links between the cards and the story nodes. Each card is linked to a number of interpretations (for example, the card 'The Fool' has interpretations including 'joy', 'optimism' and 'new beginnings'). Similarly, each story node is linked to a subset of the interpretations from the list. Readers are not necessarily presented with these interpretations.
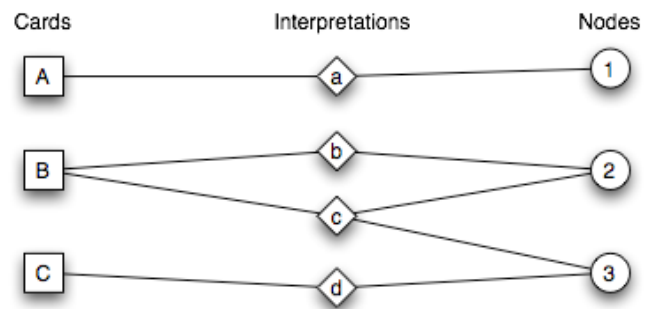

Figure 1. The StorySpinner links.

Figure 1 shows a possible subset of a StorySpinner tale. Choosing card A prompts display of node 1 via interpretation a; similarly, card C leads to node 3 via interpretation d.

Card B may lead to nodes 2 or 3, via either interpretations b or c. The card is more strongly linked with node 2, as this shares interpretations b and c, whilst node 3 only shares interpretation c.

Story nodes in this system are marked with additional metadata; a node may be marked as descriptive or as required to the story, as well as containing metadata to structure the node into one of the three acts. This allows the author to indicate that certain nodes can only occur in certain acts and also that certain nodes lead to the changing of acts.

Figure 2 shows a partial screenshot of the StorySpinner prototype interface. A selection of cards are available in the upper half of the screen, with the current reading displayed below.
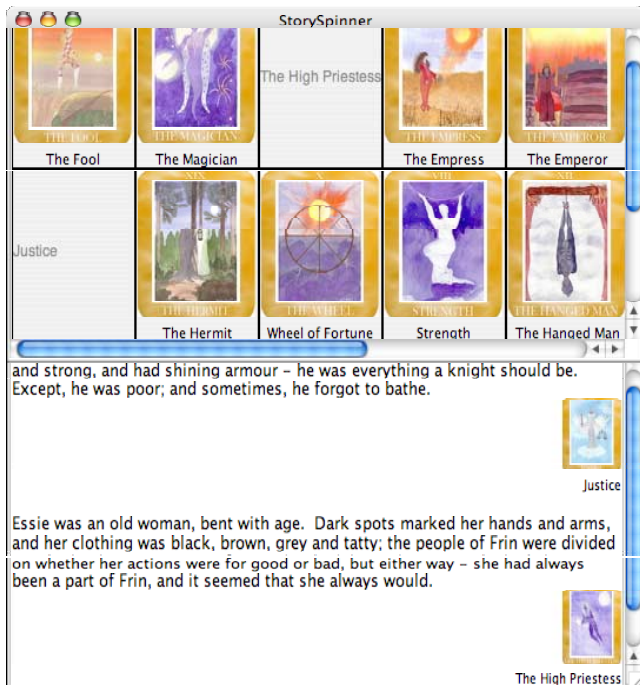
Figure 2. StorySpinner screenshot.

StorySpinner is primarily an authoring test bed; it may be used to investigate the effects of different strategies for storytelling, for example as will be shown later, altering the proportion of description within a particular hyperfiction.

StorySpinner implements a simple backtracking system which is used in the event of a dead end (a reader selecting a card which offers no links to a suitable story node, when the story is not considered completed): in this instance, the card is replaced onto the deck, and the reader may choose an alternative.

A lookahead system during node selection was used to minimize the occurrence of dead ends, however it was found that the volume of dead ends varied dramatically between different hyperfictions and (given the backtracking system) a lookahead wasn't dramatically influential.

3. NARRATIVE FLOW

There are many models of story structure, in terms of temporal flow [5] as well as mythical structures such as those identified by Propp [7]. StorySpinner adopts a less formal structure, based around three 'acts'. In the traditional sense, these are used to establish the setting, build hurdles, and finally resolve tensions.

Previous narrative engines include StoryBook [3], Card Shark [1] and the HEFTI (Hybrid Evolutionary-Fuzzy Time-based Interactive) storytelling engine [6]. Like the Card Shark and the HEFTI system, StorySpinner is a tool to organise narrative segments, rather than a generator of text itself.

When the reader makes a choice, StorySpinner seeks out story nodes which closely match the chosen card i.e. the system seeks the story node with the greatest number of interpretation matches. It considers story constraints; these are of type time (e.g. ordering two nodes, to enforce a chronology) and logic (e.g. disallowing two nodes from both being shown in one story, avoiding mutually exclusive events).

To examine issues of narrative flow, the system is configured to operate with different biases, depending upon the chosen reading style. StorySpinner offers five styles of reading; these are standard, brief, descriptive, no logic and explore:

Standard - makes full use of the 'three act' structure of narrative. During act one, nodes marked as descriptive are given priority; thus, a descriptive node with three matching interpretations will be chosen over a non-descriptive node with five matches. During act three, nodes marked as required events in the current story are given priority. The intention is to increase the pace of a story as it moves through the arcs of introducing characters, building plot, and finally reaching a resolution.

Brief - seeks out required events only.

Descriptive - gives preference to descriptive nodes.

Illogical - considers all nodes and ignores all constraints, leading to a possible lack of chronological order, repetition and seeing mutually exclusive events occurring.

Explore - considers descriptive nodes only, and again ignores all constraints. It might be viewed as a tour of the story's world.

The reading style is chosen upon starting the system. A 'no time' mode was also considered, which would selectively ignore time constraints, however, this approach fails because these constraints also assume that the Act structure divides events. For example, in the story of 'The Three Little Pigs', it is not explicitly stated that that Mother Pig sends out her children before the Wolf eats the First Little Pig, it is the act structure that enforces this.

If time constraints are ignored, then time structure within the current act is ignored, but not between acts. Additionally, if the three-act structure is ignored, then logic constraints fail because, like the time constraint, they assume the three-act structure exists, and only hold continuity within the current act. The 'no logic' style of reading implies lack of both logic *and* strict chronology.

4. DISCUSSION

Two sets of user trials were carried out with nine readers each reading two different styles of story. Feedback from the user trials of the system was mostly positive, with readers feeling that standard and descriptive stories generally 'made sense'.

It was remarked that the brief story made more sense when given the background of having previously read a standard or descriptive story – at this stage, readers already knew the characters and locations of the story. When re-reading a story, the brief story allows the exploration of alternative plot lines without the overhead of repetition of descriptions. Indeed readers were positive about the option to read in other styles, particularly commenting on the ability to choose pace, come back to a 'brief' style story after meeting the characters in another version of the tale, and to be able to experiment.

As might be expected, the story without logic made little sense to readers, and they found it hard to engage with. Explore mode was observed to be brief and not like a story ("[it] felt more like a tour than a story").

People chose cards in different ways: some based their choice on the pictures, some in a literal manner – for example, a reader clicked on 'The Moon' when he felt it might be night time ("I figured since he'd been in the woods for a while, it should probably be night soon - let's go for The Moon"). Similarly, another reader clicked on 'The Fool' to see if a foolish character would be introduced, and a third reader remarked that "I found a strong urge to hit the Devil and Justice if I found the characters annoying at any point."

It seems likely that readers will initially experiment with different methods of choosing the next card before settling with one approach; discerning this eventual reading style is difficult due to the artificial nature of the testing situation and the newness of the system to readers.

Several readers seemed to expect a more direct link between card and story (looking for the card 'Justice' when wanting a character put in his or her place, for example, or choosing 'The Fool' with expectation of seeing a foolish character).

Readers found it good to be able to explore aspects in detail, or skip forward with minimal plot, but found it harder to be immersed overall. Some wanted to reuse concepts such as 'Justice'; the idea of reusing cards was not considered in these first trials.

These results suggest that standard and long stories produce acceptable reading experiences. Brief stories work after accessing descriptions in another reading (be it standard, long or explore), whilst illogical stories are generally unsuited to producing a coherent narrative.

5. CONCLUSIONS

StorySpinner currently acts as both a reading mechanism and an authoring test bed: it allows exploration of the effects of constraining the tale in terms of descriptive nodes and logic constraints. Although the initial prototype focused on a simple three act structure, future versions may look at manipulation of stories according to characters, locations, chronology and mood.

The different story styles implemented can be said to have worked. Each produces different reading experiences, most of which readers found satisfactory.

It is intended that the StorySpinner prototype will act as a test bed to allow authors to play with and relax constraints. The problems of authoring stories using sculptural techniques has been discussed previously [2]. The connection of cards to interpretations is assumed fixed for the tarot deck used in the current implementation and a visual interface to easily allow story nodes to be associated with interpretations would seem to be appropriate. The three act structure allows simple episodic scoping but more work is needed for more complex plot development. Also, the division of required and descriptive may be too simplistic, but it provided a useful starting point for the implemented readings styles.

A fuller investigation of how readers choose and interpret the cards' meanings is also planned. As has been mentioned, the system was inspired by a Calvino story, and two issues arise from this. Firstly, in the novel the cards were interpreted by the narrator of the story yet laid out by a character storyteller. At no point does the storyteller know if his story has been correctly interpreted or the narrator if he has successfully interpreted the cards. In the StorySpinner case the reader plays the role of the Storyteller yet the narrator (StorySpinner) reflects the interpretation directly back to the reader. It has to be noted that it is unlikely that many readers use the StorySpinner with the intent of telling a specific story so the interpretations reflected back are unlikely to be taken as 'wrong' or misconstrued.

The second issue is to do with the choice of Tarot cards themselves. The characters in Calvino's story are assumed to be familiar with Tarot cards and their interpretations. Readers using the StorySpinner system are less likely to. Alternative symbols could be used instead with more intuitive interpretations. This would probably limit the interpretations available to the author but might put some of the story control back with the reader.

Initial work on StorySpinner has focused on the reader experience. Having established a basic reading test bed the intention is to further investigate the authoring system; how authors can play with logical constraints, how alternative reading styles can be incorporated into story construction and whether this style of system allows authors to develop the stories they wish to create.

The StorySpinner system has investigated control of narrative flow in hyperfiction stories through implementation of different reading styles. The system's ability to generate 'sensible' stories as well as general perceptions of this type of hyperfiction have been examined through user feedback.

6. ACKNOWLEDEGMENTS

7. REFERENCES

[1] Bernstein, M. Card shark and thespis: exotic tools for hypertext narrative. In *Proceedings of the twelfth ACM conference on Hypertext and Hypermedia,* pages 41–50, ACM Press, 2001.

[2] Bernstein, M., Millard, D. E. and Weal, M. J. On writing sculptural hypertext. In *Proceedings of the Thirteenth ACM Conference on Hypertext and Hypermedia,* pages 65–66, ACM Press, 2002.

[3] Callaway C., Lester J., Narrative Prose Generation, *Artificial Intelligence* 139, Issue 2, pages 213-252, 2002.

[4] Calvino, I. The Castle of Crossed Destinies. Vintage, Random House, 1977.

[5] Luesebrink, M. C. The moment in hypertext: A brief lexicon of time. *In HYPERTEXT '98. Proceedings of the Ninth ACM Conference on Hypertext and Hypermedia, Pittsburgh, PA, USA*, pages 106–112. ACM Press, 1998.

[6] Ong T, Leggett J., A Genetic Algorithm Approach to interactive narrative generation, *ACM Hypertext & Hypermedia Conference, Santa Cruz, USA,* pages 181-182, 2004.

[7] Propp, V. Morphology of the Folktale. *2nd ed.Austin: University of Texas Press,* 1927. Trans.,Laurence Scott. 1968.