Visualizing Redundant Paths Through Hypertext Narratives

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ABSTRACT
Visualization of interactive narrative structures remains a difficult problem; while authoring systems have developed robust ways to visually communicate narrative structures, comparatively little work has been done towards visualizing the output of playthroughs, namely story metrics and redundant content paths. This paper explores an interactive visualization that quickly helps authors spot redundant paths in interactive narratives. By treating branching narratives as directed graphs and walking the graph of each unique path through a story, the visualization collects all possible paths through a narrative, increasing size and line thickness of the paths through the narrative to indicate nodes and links visited on different possible paths. The outcome is a clear indication of redundant paths and most-visited nodes.

Categories and Subject Descriptors
tk

General Terms
tk

Keywords
Visualizations, Hypertext, Twine, Interactive Narrative

1. INTRODUCTION
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2. MOTIVATION
Conventional approaches to authoring interactive narratives still rely on rigorous playtesting and intuition to guide their creation. While some companies are experimenting with embedded data tools to drive ongoing narrative content [Telltale? transmedia, sources tk], these methods are still not widely adopted.

Some of the most popular tools for interactive narrative creation, including Twine, Inform, Tinderbox, and Undum[be sure to cite these tk]; leave much to be desired in terms of information conveyed about the stories created with them. While some of the more flexible visual tools like Tinderbox or Twine provide authoring interfaces that convey information about the structure of the authoring process—e.g. robust graph layouts—but offer relatively fewer visual representations for how the narrative might actually be experienced or which metrics the authors might consult to improve the story.

Since “improving the story” is a subjective undertaking, the best a visualization tool can hope to offer is a concise way to convey information, leaving the authors to adjust their stories to their own aesthetic goals. Still, the visualization of story metrics is lacking in most of the major systems: number of endings, paths to those endings, redundancies in paths, and narrative-state tracking are all underdeveloped in these tools.

3. RELATED WORK
Christian Swinehart visualized different paths of Choose Your Own Adventure Books by generating all possible outcomes of playthroughs.[3] [elaborate tk]

While this methodology worked to great success in Swinehart’s examples for interactive analog narratives, interactive digital narratives present additional challenges. For example, Swinehart’s source material contained no cycles, no states to track, and no recurses. Still, the prospect of visualizing possible endings and repeated passages by generating all possible play-throughs of a narrative are interesting and worth further exploration.

In terms of authoring tools, Eastgate Systems’ hypertext tool, Tinderbox, [1] largely believed to be one of the most robust authoring tools for interactive narrative in terms of visualization capabilities [citation tk], provides many dimensions of visual signifiers for authors to utilize on individual nodes—size, shape, color, opacity, etc.—but does not provide information on the possible outcomes of playthroughs including whether a certain node will be visited on successive plays. Authors may decide whether their nodes will be blue, defining for themselves what blue signifies to them, but the system does not give them output information.

4. PROPOSED WORK
In this project, I hope to apply Swinehart’s techniques to the interactive digital narrative space by creating a visualization that will show naive likelihood of endings and repeated narrative passages.

4.1 Hypertext Narratives as Graphs
Hypertext narratives are best understood as directed graphs in which the reader (or “player” if the hypertext piece is a game with a desired goal endstate) begins the narrative at one node (“Start”) and ends the piece at a designated ending, which could be one among many and could be desirable or not.

By walking the graph from the “Start” node to an end state, the system can generate a “playthrough” of the game; by walking all paths to all end states, the system can keep track of all possible
“paths” through a narrative. If only one node is connected to the start node, and the narrative branches from there, the second node would necessarily be revisited on every playthrough. Authors may or may not desire such an outcome for any given node, but this kind of repetition is the very thing this system hopes to elucidate.

Figure 1: (placeholder) Explanation of unique story paths [tk]

4.2 Visualizing Redundancies
Replay is a goal for many hypertext authors, and understanding which nodes are revisited and which links are traversed from one

playthrough to the next is incredibly useful to authors who hope to foster replay in their works.

This system hopes to visualize redundant content by visualizing the graph structure of the piece with larger nodes for those revisited on multiple playthroughs, and thicker lines to denote links traversed on multiple playthroughs. Having a quick way to spot redundancies can help authors alter their content in the ways they find most appropriate.

5. CONCLUSION
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6. ACKNOWLEDGMENTS
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7. REFERENCES
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