

Computer-assisted authoring tools help to create complex interactive narratives

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Visitors to interactive virtual worlds want the ability to significantly affect the outcome of a story, but authoring these digital experiences is extremely complex. A new platform developed by Disney Research will help fulfill the medium's promise by automating some aspects of the authoring process.

Disney Research has developed a new design paradigm called interactive behavior trees (IBTs), a graphical modeling language that accommodates multiple story arcs. They also have created authoring tools that can automatically detect and resolve narrative inconsistencies that arise as these various story arcs play out or when users interact in unexpected ways.

The researchers will present their authoring method at i3D 2015, the

ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games in San Francisco, Feb. 27-March 1.

"We want interactive narratives to be an immersive experience in which users can influence the action or even create a storyline, but the complexity of the authoring task has worked against our ambitions," said Mubbasir Kapadia, who recently left Disney Research to join Rutgers University as an assistant professor of computer science. "Our method of modeling multiple story arcs and resolving conflicts in the storylines makes it feasible to author [interactive experiences](#) that are free form, rather than constricted."

Computer games, for instance, often include isolated interactive segments but all players ultimately experience the same plot. In other cases, interactive narratives may allow different outcomes, but writing these experiences is so complex that the user is given only limited choices and can alter the story only at certain key points.

IBTs address these narrative shortcomings. Like behavior trees, a modeling language used by software engineers to keep track of the mind-boggling number of requirements for large-scale software systems, IBTs help the authors of interactive narratives to spin multiple stories while providing users with great freedom to interact. The hierarchical IBT structure enables each story arc to be defined as its own subtree; at the same time, user interactions are monitored independently, as are those interactions that trigger new story arcs.

"With this structure, increased user interaction does not make the author's task more complex," Kapadia said, "so we can now imagine ways of giving the user more freedom to interact freely with the virtual world."

Authoring interactive narratives nevertheless remains challenging, so the

Disney team has developed automated tools to find and resolve the inconsistencies that can arise in storytelling.

For instance, in a narrative involving two bears at play, if one of the bears lacks the beach ball he was supposed to throw to the other, the tool will detect the inconsistency and offer a narrative fix, such as allowing the bear to ask the user for the ball, or to buy a ball from a vendor with money from a treasure chest.

"These automated tools empower the author to focus on storytelling, rather than worry about resolving every possible conflict as the many story arcs intersect," Kapadia said.

Even though these methods reduce the complexity of authoring interactive narratives, the Disney researchers note that it continues to be demanding and that using the IBTs requires, at least for now, a computer programming background.

More information: [www.disneyresearch.com/wp-cont ... Narratives-Paper.pdf](http://www.disneyresearch.com/wp-content/uploads/2015/02/Narratives-Paper.pdf)

Provided by Disney Research

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