Narratoria, an Authoring Suite for Digital Interactive Narrative

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Abstract

In this paper we present an authoring tool called Narratoria[1] that allows non-technical experts in the field of digital entertainment to create interactive narratives with 3D graphics and multimedia. Narratoria allows experts in digital entertainment to participate in the generation of story-based military training applications. Users of the tools can create story-arcs, screenplays, pedagogical goals and AI models using a single software application. Using game engines, which provide direct visual output in a real-time feedback-loop, users can view the final product as they edit.

Introduction

The software presented in this document seeks to provide sufficient authoring capabilities to allow users to create training applications using interactive narrative without the need of programmers. Novices and professionals alike can use the system's toolset to manage and create complex interactive storylines. Traditional film has come a long way from the days of black and white movies accompanied by live piano playing. Video games have progressed even faster but are still catching up with the narrative possibilities of film. New approaches in both interactive drama and video-game technology open the way for exploration of what could be called interactive films (Young, 2003), but much work remains to be done for research (and commercial) implementations and usage by those who have mostly used traditional media. Fast computers can generate very realistic scenes, but only if told exactly what to display. Narratoria attempts to provide an integrated authoring solution by giving users easy to use drag and drop tools for compositing complex dramatic scenes using game technologies.

Authoring Interactive Narrative

In our first authoring effort, the Institute for Creative Technologies' (ICT) Leaders project (Gordon, 2004) used a commercial game engine (Unreal Tournament™) to immerse the user in an interactive decision making game. The Leaders simulation uses cinematic cut-scenes linked together through pre-defined decision points in a story

graph. Decisions are elicited from users through a Naïve Bayseian natural language classification interface, which triggers the system to progress the story to a different decision point through the display of a rendered scene in the game. In our Army oriented training application, the production started with the collection of anecdotes from Army Captains who recently returned from the field. These anecdotes were analyzed by pedagogical experts and turned into plot points or decision points. Our screenplay writers linked plot points into a story graph, where each full branch represented a story arc and nodes represent plot or decision points. Story arcs ensure a coherent and engaging experience, whereas the plot points ensure that users have to navigate decisions. The story graph was then turned into a concrete movie script that mapped decisions into engaging story arcs. Since traditional scripts are linear stories we added mechanisms to cluster scenes into what we call story molecules. Each molecule was self contained in that it could be played by itself but could also be combined with other molecules. This modular script in turn was given to a director and our animation lead. A director matched the script to storyboards, whereas the animation lead created an inventory of characters and animations needed to express the story. Finally a team of animators in collaboration with a director composed the final game from all the available digital content stored in libraries.

User Interaction: A Question of Language

A major hurdle in creating an authoring tool for film based interactive narrative lies in the fact that multiple experts are needed. Each of these experts might use a different expression language specific to a field. An expression language could be thought of the as way experts express the models most salient to their field. For example, software developers write code that operates on spatial X, Y and X coordinates, whereas film directors work in terms of medium and long camera shots, etc. The software tool presented in this paper hides from the user the fact that each expert works in his or her own language. It does this by integrating a number of editing tools, such as script editors, story graph editors and timeline editors. Behind the scenes the authoring application translates the interaction into shared software structures with a goal to provide an interactive narrative interoperability platform. For example screenplays can be written using the Narratoria movie script editor module, whereas film editors use the timeline editor module. Feedback is achieved through anchor points

placed in the virtual environment, and are used for to place actors or to placing and moving cameras, etc. All other control over the world is achieved by having code interpret the intentions of the artists and by a director giving performance hints to the game engine. Further character performance is achieved by code that blends animations from a library in different ways to create new gestures. This blending is accessible from the timeline module where the final visuals are composed. The result resembles acts as a digital stage where directors interact with virtual actors.

Narratoria in Production, Preliminary Results

The Narratoria authoring tools have been used in numerous projects at the ICT. In the ICT Leaders project before the introduction of authoring tools, animations were called by custom code in the game. Programmers moved the virtual actors around and had them speak lines using pre-recorded audio. Additional camera control code added means to place and move cameras. With this approach the screenplay took six months to implement. After introducing Narratoria into the pipeline the production time was reduced to three months. During the last three months of production, no programmers were needed to produce any of the content. We recently added a pedagogical authoring module for those games that use an automated tutor. For example, in authoring the ICT's ELECT BiLAT game (Hill, 2006), authors use drag and drop techniques to associated learning objectives with game content that models a user's interactions. An automated tutor then uses this information to track a student's performance.

Related Work

Similar combinations of tools exist, which take on the separate areas of screenplay writing, movie-clip sequencing and animation creation (Robertson, 2004; Baecker, 1996), but none integrate the tools into one pipeline. Some more recent applications originating in the research community do allow traditional media types to be combined with novel abstract action sequences using XML documents but these systems either do not provide an intuitive mechanism for artists to access the materials (Gebhard, 2003; Bulterman) or they do not allow non-traditional actions such as character animation or camera actions to be used (Harada, 1996; Ueda, 1991).

Future Work

With a framework in place that is targeted towards cinema style training applications we need to address a number of factors. First of all the software needs to be adapted to different forms of interactive narrative. Third, better collaboration mechanisms are needed to support users

remotely located working on data simultaneously. Finally, since the authoring software is targeted to be used by novices of interactive narrative, we need to provide easier ways to author training applications.

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