

Real-Time Cinematic Camera Control for Interactive Narratives

Dan Amerson
NDL Corporation
1506 E. Franklin St. Suite 302
Chapel Hill, NC, 27504
1.919.929.2917
amerson@ndl.com

Shaun Kime
NDL Corporation
1506 E. Franklin St. Suite 302
Chapel Hill, NC, 27504
1.919.929.2917
Shaun.Kime@ndl.com

R. Michael Young
Department of Computer Science
North Carolina State University
Raleigh, NC, 27695
1.919.513.3038
young@csc.ncsu.edu

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Miscellaneous.

1. INTRODUCTION

Current 3D game engines offer the potential for new types of interactive storytelling. In this paper, we discuss automated cinematography as it relates to interactive narratives in virtual worlds. Due to the interactive nature of these environments, automated camera controllers cannot fully utilize all of the idioms in the domain of cinematography. It is important to note that substantial investigations into interactive cinematography have already been made [1, 2, 3]. In contrast to these individual systems, we propose a hybrid system that uses abstractly defined cinematographic idioms as constraints to choose the best camera placement for any shot at any moment within any geometry.

2. FILM AS A METAPHOR

Most people are comfortable with narratives that are conveyed using video and sound because Hollywood cinema has created a structured style for conveying stories that is familiar to viewers. These structured scenes and shots are referred to as film *idioms*. We encode film idioms at the scene level in the FILM system. Scenes can further be broken down into *shots*. A shot in cinema is an uninterrupted segment of exposed film.

The structure of the camera control architecture proposed here is based on the notion of classical filmmaking practices. In the FILM system, decision-making individuals like the director and cinematographer are represented by software objects of the same name, and possible camera movements are broken down into scenes composed of shots. The director selects scenes based on the subject nature of the shot. Unlike true cinema,

however, the state of the world is not wholly determined when the director makes decisions. For example, in film the director can control how actors move. Because game environments are interactive, predictions must be made about how the state of the world will change. Because of this, shots and scenes are specified with constraints that can be relaxed in case of conflict.

3. SUMMARY OF THE CAMERA CONTROL ARCHITECTURE

The FILM system is defined by a pipeline of components. We assume that an external system generates input to the FILM system, specifying the story-related information that must be conveyed to a user during a given scene (typically, the actions carried out by characters and their actions' consequences). This information is passed to the *Director*, which uses the scene requirements to select a specific film idiom from a predefined *scene tree*. It then binds any unbound variables in the chosen scene representation to objects in the virtual world. This scene specification is then passed down to a *Cinematographer* component specific to the graphics engine being used. The Cinematographer takes the constraints that define the individual shots in a scene and chooses the best camera position in the world to satisfy those constraints.

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4. REFERENCES

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