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Video-Based Interactive Storytelling

TESE DE DOUTORADO

DEPARTAMENTO DE INFORMÁTICA
Programa de Pós-Graduação em Informática

Rio de Janeiro
August 2014



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Thesis presented to the Programa de Pós-Graduação em Informática of the Departamento de Informática, PUC-Rio as partial fulfillment of the requirements for the degree of Doutor em Informática

Advisor: Prof. Bruno Feijó

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Rio de Janeiro, August 4th, 2014

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Bibliographic data

Lima, Edirlei Everson Soares de

Video-Based Interactive Storytelling / Edirlei Everson Soares de Lima ; Advisor: Bruno Feijó – 2014.

218 f. : il. (color.) ; 30 cm

Tese (doutorado) – Pontifícia Universidade Católica do Rio de Janeiro, Departamento de Informática, 2014.

Inclui bibliografia

1. Informática – Teses. 2. Storytelling Interativo. 3. Dramatização Baseada em Vídeo. 4. Composição de Vídeo. 5. Cinematografia Virtual. I. Feijó, Bruno. II. Pontifícia Universidade Católica do Rio de Janeiro. Departamento de Informática. III. Título.

CDD: 004

Acknowledgments

First and foremost, I would like to express my deepest and sincerest gratitude to my advisor, Prof. Bruno Feijó, for his constant guidance, support and incentive during all these years of research. Besides being an outstanding advisor, he has been like a father and a very good friend to me. My appreciation for his continuous support in all the aspects of my research is immeasurable.

This thesis would also not have been possible without the expert guidance and support of many of my unofficial advisors. First, I would also like to thank Prof. Antonio Furtado for constantly guiding me with his extensive knowledge and enthusiasm. My grateful thanks also to Prof. Cesar Pozzer for his constant guidance and insightful discussions. Special thanks to Prof. Simone Barbosa for her precious advices on Human-Computer Interaction. And I would also like to thank Prof. Angelo Ciarlini for his support and collaboration on many of my research works.

I would also like to thank all the people that have been involved in the production of the prototype video-based interactive narratives. Special thanks to Marcelo Feijó for his excellent work in writing the scripts and directing the production of the interactive narratives; and to Bruno Riodi for his great work in editing and preparing the video material.

I would also like to thank CAPES (Coordination for the Improvement of Higher Education Personnel, linked to the Ministry of Education) and CNPq (National Council for Scientific and Technological Development, linked to the Ministry of Science, Technology, and Innovation) for the financial support for this research. Special thanks to the staff of the Department of Informatics (PUC-RIO) and to the ICAD/VisionLab for providing an excellent research environment.

Finally, I would also like to thank my parents for their constant support and encouragement.

Abstract

Lima, Edirlei Everson Soares de. **Video-Based Interactive Storytelling**. Rio de Janeiro, 2014. 218p. DSc Thesis - Departamento de Informática, Pontifícia Universidade Católica do Rio de Janeiro.

The generation of engaging visual representations for interactive storytelling represents a key challenge for the evolution and popularization of interactive narratives. Usually, interactive storytelling systems adopt computer graphics to represent the virtual story worlds, which facilitates the dynamic generation of visual content. Although animation is a powerful storytelling medium, live-action films still attract more attention from the general public. In addition, despite the recent progress in graphics rendering and the wide-scale acceptance of 3D animation in films, the visual quality of video is still far superior to that of real-time generated computer graphics. In the present thesis, we propose a new approach to create more engaging interactive narratives, denominated “Video-Based Interactive Storytelling”, where characters and virtual environments are replaced by real actors and settings, without losing the logical structure of the narrative. This work presents a general model for interactive storytelling systems that are based on video, including the authorial aspects of the production phases, and the technical aspects of the algorithms responsible for the real-time generation of interactive narratives using video compositing techniques.

Keywords

Interactive Storytelling; Video-Based Dramatization; Video Compositing; Virtual Cinematography.

Resumo

Lima, Edirlei Everson Soares de. **Storytelling Interativo Baseado em Vídeo**. Rio de Janeiro, 2014. 218p. Tese de Doutorado - Departamento de Informática, Pontifícia Universidade Católica do Rio de Janeiro.

A geração de representações visuais envolventes para storytelling interativo é um dos desafios-chave para a evolução e popularização das narrativas interativas. Usualmente, sistemas de storytelling interativo utilizam computação gráfica para representar os mundos virtuais das histórias, o que facilita a geração dinâmica de conteúdos visuais. Embora animação tridimensional seja um poderoso meio para contar histórias, filmes com atores reais continuam atraindo mais atenção do público em geral. Além disso, apesar dos recentes progressos em renderização gráfica e da ampla aceitação de animação 3D em filmes, a qualidade visual do vídeo continua sendo muito superior aos gráficos gerados computacionalmente em tempo real. Na presente tese propomos uma nova abordagem para criar narrativas interativas mais envolventes, denominada “Storytelling Interativo Baseado em Vídeo”, onde os personagens e ambientes virtuais são substituídos por atores e cenários reais, sem perder a estrutura lógica da narrativa. Este trabalho apresenta um modelo geral para sistemas de storytelling interativo baseados em vídeo, incluindo os aspectos autorais das fases de produção e os aspectos técnicos dos algoritmos responsáveis pela geração em tempo real de narrativas interativas usando técnicas de composição de vídeo.

Palavras-chave

Storytelling Interativo; Dramatização Baseada em Vídeo; Composição de Vídeo; Cinematografia Virtual.

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