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Transactions on Edutainment VII

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Preface

In this issue, the papers are from two main sources. The first set of articles comprises 16 selected papers from the CASA 2011 conference, which was held during May 25–28, 2011. The second set of 11 papers are from DMDCM 2010, which was held during December 19–20, 2010.

In the first set, the first five papers are on virtual humans. In the paper by Stephane Bonneaud et al., the authors introduce a study of small crowds walking toward a common goal and propose to make the link between individual behavior and crowd dynamics. Experimental data show that participants, even though not instructed to behave collectively, do form a cohesive group and do not merely treat one another as obstacles. They also present qualitative and quantitative measurements of this collective behavior. In the second paper, Julien Valentin et al. present their work on simulating fire evacuation, whose aim is to analyze how easily a building can be evacuated in different fire scenarios, at the early stages of building design. In the third paper, Lin Zhang et al. discuss the application of virtual reality and physical system simulation technology to physical education and athletic training as well as interactive methodological advances. In the fourth paper, Wei Hua et al. propose a novel depth-varying human video sprite synthesis method, which significantly increases the degrees of freedom of human video sprites. A novel image distance function encoding scale variation is proposed, which can effectively measure human snapshots with different depths/scales and poses. In the fifth paper, the authors introduce a system for expressive locomotion generation that takes as input a set of sample locomotion clips and a motion path.

The following six papers are on graphics rendering and 3D animation. In the first paper, by Wenshan Fan et al., the authors present a new approach for constructing normal maps that capture high-frequency geometric detail from dense models of arbitrary topology and applies to the simplified version of the same models generated by any simplification method to mimic the same level of detail. In the paper by Jianxin Luo et al., a novel framework for terrain visualization is proposed. The main ideal of the framework is to lay the height field textures and the color textures of all visible terrain tiles in a big texture, then use the single big height field texture and the single big color texture to perform ray casting to get the final image. In the next paper, Shao-Shin Hung proposes a new object-oriented hypergraph-based clustering approach based on a behavioral walkthrough system that uses traversal patterns to model relationships between users and exploits semantic-based clustering techniques, such as association, intra-relationships, and inter-relationships, to explore additional links throughout the behavioral walkthrough system. In the fourth paper, Yujian Gao et al. introduce a method for interactive deformation of large-detail meshes. Their method allows the users to manipulate the mesh directly using

freely selected handles on the mesh. To best preserve surface details, the authors introduce a new surface representation, the skin-detached surface. In the fifth paper, Shiguang Liu et al. present a novel method for realistic simulation of solid objects burning. The temperature field is first constructed based on combustion theories. Then, a temperature field-motivated interaction model is proposed to simulate the interactions between the fire and the objects during burning. In the sixth paper, by Chao Wang et al., the authors simulate tunneling blasting by combining blasting animation of computer graphics with mining empirical formulas. A connected voxel model is used to represent rocks and their failure mechanism. This simulation helps engineers test and adjust blasting schemes before real operations.

The following five papers in the first set are on games and 2D animation. In the paper by Gustavo Aranda et al., the model and method behind this architecture are presented, paying special attention to the definition and design of the “Game Zones,” the representation of the virtual environment. Also, the authors detail the components and steps to follow in the design of MMOGs based on organizations. In the paper by Zhiying He et al., a novel skeleton-extracting and animation approach for point models is put forward, which explores the differential properties of point models without triangulating the discrete points. In the next paper, Xin Zhang et al. present a novel density control algorithm to achieve interactive line drawing of 3D scenes. The kernel of their approach is a line selection method that considers both the geometric property of lines and the view-dependent line density in the image space. Nicolas Szilas et al. take a look at narrative forms as of yet unexplored in the field of digital interactive storytelling, and describe methods of how they can be used in engaging ways for the user. The paper by Shengnan Chen et al. presents a virtual informal learning system for the famous ancient painting “Qing-ming Festival by the Riverside.” Innovative multi-screen projection and interaction techniques are also presented.

The second set of papers focuses on digital media and its applications. In the paper by Xingquan Cai et al., an efficient multi-samples texture synthesis method is provided for dynamic terrains based on constraint conditions. In the next paper Zhicheng Liu et al. prove that principal component analysis and linear discriminant analysis can be directly implemented in the wavelet cosine transform domain and the results are exactly the same as those obtained from the spatial domain. In the paper by Shidu Dong et al., an area measurement method of paint bubble based on computer vision is introduced. In the paper by Xifan Shi et al., a high-precision fresco scanner is presented and the authors discuss the way to improve image sharpness from the perspective of both theory and practice. In the paper by Zhijun Fang et al., a multiwavelet video coding scheme based on DCT time-domain filtering is proposed. Xingquan Cai et al. then present an efficient simulation method for realistic ocean scenes on GPU. Lili Zhai et al. compare the use of 2D wire-framed images and 3D wire-framed animations as stimuli for the judgment of female physical attractiveness and estimation of body weight and waist-to-hip ratio. In the next paper, Jianxun Zhang et al. propose a new method of medical image registration based on wavelet

transform using Hausdorff distance. In the paper by Jiali Feng et al., the key technology of HPSIN-based distributed vector geo-data online services is studied, and a pattern of vector geo-data organization based on linking mechanisms, segmentation and lossless reconstruction is proposed. The paper by Jingrong Zhang et al. introduces a method based on ant colony optimization to enhance the plate quality of cold rolled strip steel, a method based on ant colony optimization with quantumaction. In the last paper, by He Yan et al., a new shift-invariant non-aliasing ridgelet transform is presented to avoid aliasing and shift-variant in the old ridgelet transform.

We believe that this issue contains a nice selection of the current research in edutainment and its applications, and we hope these papers will contribute to and attract more research interest in this area.

Mingmin Zhang

Transactions on Edutainment

This journal subline serves as a forum for stimulating and disseminating innovative research ideas, theories, emerging technologies, empirical investigations, state-of-the-art methods, and tools in all different genres of edutainment, such as game-based learning and serious games, interactive storytelling, virtual learning environments, VR-based education, and related fields. It covers aspects from educational and game theories, human-computer interaction, computer graphics, artificial intelligence, and systems design.

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Table of Contents

Papers from CASA 2011

Accounting for Patterns of Collective Behavior in Crowd Locomotor Dynamics for Realistic Simulations	1
<i>Stéphane Bonneaud, Kevin Rio, Pierre Chevaillier, and William H. Warren</i>	
Human Behaviour Modelling for Simulating Evacuation of Buildings on Fire	12
<i>Julien Valentin, Florent Coudret, Eric Gouardères, and Wilfrid Lefer</i>	
Application of Simulation and Virtual Reality to Physical Education and Athletic Training	24
<i>Lin Zhang and Qing Liu</i>	
Depth-Varying Human Video Sprite Synthesis	34
<i>Wei Hua, Wenzhuo Yang, Zilong Dong, and Guofeng Zhang</i>	
Automating Expressive Locomotion Generation	48
<i>Yejin Kim and Michael Neff</i>	
Recovering Geometric Detail by Octree Normal Maps	62
<i>Wenshan Fan, Bin Wang, Bin Chan, Jean-Claude Paul, and Jianguang Sun</i>	
Quad-Tree Atlas Ray Casting: A GPU Based Framework for Terrain Visualization and Its Applications	74
<i>Jianxin Luo, Guiqiang Ni, Ping Cui, Jinsong Jiang, Yifeng Duan, and Guyu Hu</i>	
Clustering Spatial Data for Aggregate Query Processing in Walkthrough: A Hypergraph Approach	86
<i>Shao-Shin Hung, Chih Ming Chiu, Tsou Tsun Fu, Jung-Tsung Chen, Derchian Tsaih, and Jyh-Jong Tsay</i>	
Skin-Detached Surface for Interactive Large Mesh Editing	99
<i>Yujian Gao, Aimin Hao, and Qinpeng Zhao</i>	
Physically Based Simulation of Solid Objects' Burning	110
<i>Shiguang Liu, Tai An, Zheng Gong, and Ichiro Hagiwara</i>	
Tunneling Blasting Simulation for Digital Mine	121
<i>Chao Wang, Yu Wu, Tingting Zhu, Hongbo Li, and Mingliang Xu</i>	

Massively Multiplayer Online Games Developed with Agents	129
<i>Gustavo Aranda, Tomas Trescak, Marc Esteve, Inmaculada Rodriguez, and Carlos Carrascosa</i>	
A Novel Skeletonization and Animation Approach for Point Models	139
<i>Zhiying He, Xiaohui Liang, and Qinpeng Zhao</i>	
View-Dependent Line Drawings for 3D Scenes	151
<i>Xin Zhang, Zi'ang Ding, Chuan Zhu, Wei Chen, and Qunsheng Peng</i>	
Propositions for Innovative Forms of Digital Interactive Storytelling Based on Narrative Theories and Practices	161
<i>Nicolas Szilas, Monica Axelrad, and Urs Richle</i>	
A Virtual Informal Learning System for Cultural Heritage	180
<i>Shengnan Chen, Zhigeng Pan, and Mingmin Zhang</i>	

Papers from DMDCM 2010

Multi-samples Texture Synthesis for Dynamic Terrain Based on Constraint Conditions	188
<i>Xingquan Cai, Jie Li, Haiyan Sun, and Jinhong Li</i>	
PCA and FLD in DWT Domain	197
<i>Zhicheng Liu and Zhijun Fang</i>	
Area Measurement Method of Paint Bubble Based on Computer Vision	205
<i>Shidu Dong, Xiaofan Yang, Huaqiu Wang, Xiang Liu, and Hengyang Liu</i>	
A High Precision Fresco Scanner	214
<i>Xifan Shi, Xianghua Chen, and Tiefeng Cai</i>	
Multiwavelet Video Coding Based on DCT Time Domain Filtering	222
<i>Zhijun Fang, Guihua Luo, Jucheng Yang, and Shouyuan Yang</i>	
Rendering Realistic Ocean Scenes on GPU	230
<i>Xingquan Cai, Baoxin Qian, Haiyan Sun, and Jinhong Li</i>	
Effect of Body Image Presentation Format to Female Physical Attractiveness	239
<i>Lili Zhai, Xiaoming Qian, Rui Wang, Jintu Fan, and Heyue Wei</i>	
Medical Image Registration Based on Wavelet Transform Using Hausdorff Distance	248
<i>Jianxun Zhang and Yu Liu</i>	

Study on Key Technology of HPSIN-Based Vector Geo-data Online Service	255
<i>Jiali Feng, Nan Jiang, Bin Hu, Jiagao Wu, and Zhiqiang Zou</i>	
Defection Recognition of Cold Rolling Strip Steel Based on ACO Algorithm with Quantum Action.....	263
<i>Jinrong Zhang and Yue Wang</i>	
Line Feature Enhancement Using a New Shift-Invariant Non-aliasing Ridgelet Transform.....	272
<i>He Yan, Youjia Fu, and Guangzhi Yin</i>	
Author Index	283