EDITORIAL

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Editorial

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This is a special issue dedicated to the 2006 International Conference on Cyberworlds, CW 2006, which was held in EPFL, Lausanne, Switzerland 28–29 November 2006. Cyberworlds are information worlds formed in cyberspace within computing networks. Created intentionally or spontaneously, they can be virtual or real, as well as mixed reality. The international conferences on cyberworlds have been organized yearly since 2002. The 30 papers presented at CW 2006 discussed topics of virtual, mixed and augmented reality; 3D environments and motion; cyber-business; geospatial, terrain, and hydrological applications; collaborative and distributed virtual environments; cyber-security; search engines and visual querying; modeling, simulation and complexity. The conference proceedings were printed by the IEEE Computer Society Press. The authors of seven carefully selected papers have been asked to prepare revised and significantly amended papers for this special issue.

The first paper by Enhua Wu, Hongbin Zhu, Xuehui Liu, and Youquan Liu from China and USA is dedicated to the fluid simulation. To investigate the interaction behavior in physically based simulation of fluids, the authors propose physical models to represent the varying interactions between fluids and the environments, as well as among the mixtures.

The second paper by Asako Soga, Bin Umino, Takami Yusuda, and Shigeki Yokoi from Japan describes an automatic composition system for ballet choreographies. The system is intended to be a creation-support system for bal-

let teachers and a self-study system for students. As a result of evaluation tests, the authors have verified that the created choreographies have a possibility to be used in the actual lessons.

Arjan Egges, George Papagiannakis, and Nadia Magnenat-Thalmann from The Netherlands and Switzerland present in the third paper a simple and robust mixed reality framework for real-time interaction with virtual humans. Their fast animation engine can handle various types of motions, such as keyframe animations or motions generated on the fly by adapting previously recorded clips.

The fourth paper by Olga Sourina from Singapore proposes a novel function-based query model for arbitrary shape spatio-temporal querying. The queries are defined as geometric shapes changing over time. With the uniform geometric model, the author integrates visual mining and querying of time-dependent data employing 3D visualization tools. An application in molecular dynamics is presented.

In the fifth paper, Valery Afanasiev, Dmitry Baigozin, Ilia Kazanski, Sergey Fomin, and Stanislav Klimenko from Russia present new types of trees of structure and linked lists with variable relations. Using them enables application of the direct kinematic scheme for simulation of 3D objects with reorderable structure, making the logic of behavior simulation more natural.

In the sixth paper, Gianluca Mura from Italy introduces a methodology for the realization of new virtual realities through the language of abstract art. The model is easy to implement within the web architecture, with different usage modality and it also founds a base for different types of aesthetic languages for digital communication.

The last paper by Dai Hanawa and Tatsuhiro Yonekura from Japan proposes a new method to extrapolate the attribute data which arrive at discrete time period in a distributed virtual environment. Their method is based on the properties of the polynomial models. In order to confirm the advantage of their method, the authors have conducted

experiments with the pen motion of a series of letters by human.

We are very grateful to the editor-in-chief of *The Visual Computer*, Professor Nadia Thalmann, for providing us with the opportunity to showcase the best papers presented at the 2006 International Conference on Cyberworlds. We hope this fruitful cooperation will continue. The next conference on Cyberworlds, CW 2007, will be held in Hannover 24–26 October 2007.

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Guest Editors

PROFESSOR DR. DANIEL THALMANN is Professor and Director of The Virtual Reality Lab (VRlab) at EPFL, Switzerland. He is a pioneer in research on virtual humans. His current research interests include real-time virtual humans in virtual reality, networked virtual environments, computer animation, and 3D interaction. Daniel Thalmann has been Professor at The University of Montreal and Visiting Professor/Researcher at CERN, University of Nebraska, University of Tokyo, and Institute of System Science in Singapore. He is co-editor-in-chief of the *Journal of Computer Animation and Virtual Worlds*, and member of the editorial board of *The Visual Computer* and four other journals. Daniel Thalmann was member of numerous Program Committees, Program Chair and Co-Chair of several conferences. He is Program Co-Chair of CGI 2007, Virtual Rehabilitation 2007, ACM VRST 2008 and the Conference Co-Chair of CASA 2007 and SCA 2007. He has also organized five courses at SIGGRAPH on human animation. Daniel Thalmann has published more than 400 papers in graphics, animation, and virtual reality. He is co-editor of 30 books, and coauthor of several books including the *Handbook on Virtual Humans*, published by Wiley. He received his Ph.D. in Computer Science in 1977 from the University of Geneva and an Honorary Doctorate (Honoris Causa) from University Paul-Sabatier in Toulouse, France, in 2003.

DR. ALEXEI SOURIN is an Associate Professor with the School of Computer Engineering at Nanyang Technological University (NTU) in Singapore. He received his M.Eng. and Ph.D. degrees in Computer Graphics from the Moscow Engineering Physics Institute (MEPhI) in 1983 and 1988, respectively. From 1983 to 1993 he was a researcher at MEPhI. Since 1993 he is on the academic staff of NTU. His research interests are in function-based shape modeling, shared virtual environments, web visualization and visualization on the Grid, cyber-medicine, scientific visualization, and cyber-learning. He is one of the pioneers of electronic education in Singapore. He is also a deputy director of the NTU's Centre for Financial Engineering. He authored a book *Computer Graphics. From a Small Formula to Cyberworlds* which is adopted for teaching by several universities in Southeast Asia. He is a Senior Member of IEEE and a member of ACM SIGGRAPH. He is a member of the Steering Committee of the International Conferences on Cyberworlds. He was a Program Chair of CW 2003, CW 2004 and CW 2005 and a General Co-Chair of CW 2006. He is a General Co-Chair of the upcoming CW 2007. More details are available at http://www.ntu.edu.sg/home/assourin.