

Diego Gutierrez
Siti Mariyam Shamsuddin

Guest editorial

Published online: 23 May 2007
© Springer-Verlag 2007

D. Gutierrez (✉)
Universidad de Zaragoza, CPS (Edificio Ada Byron),
Maria de Luna 1, 50018 Zaragoza, Spain

S.M. Shamsuddin,
Department of Graphics and Multimedia,
Faculty of Computer Science and Information System,
University Technology of Malaysia,
Malaysia

As guest editors, we are proud to present the seven papers contained in this issue of *The Visual Computer*. The related topics range from high dynamic range imaging, to inverse tone mapping, rendering, polygon visibility and animation. The first paper, “Spatially varying image based lighting by light probe sequences: capture, processing and rendering” presents a novel technique for capturing spatially or temporally resolved light probe sequences, which can then be used for image based lighting. It is an extended version of the Best Paper Award winner submission that the authors presented last year at ACM GRAPHITE. Still related to HDR, the paper “A framework for inverse tone mapping” tackles the problem of extending the dynamic range of current single exposure, low dynamic range images, by finding the areas considered to be of high luminance and then building an expand map based on density estimation.

The next work, “The photon pipeline revisited: a hardware architecture to accelerate photon mapping” uses real-time ray tracing to generate photon points and camera points, while dealing with the gathering phase of the algorithm in a efficient way. The architecture is predicted to fit easily on custom hardware, and thus photon mapping may be a good choice for real-time rendering in the future. Also trying to reduce computation times in render-

ing, the paper “Optimization techniques for curved path computing” presents a series of ideas that can be applied in a scene containing an inhomogeneous medium, which makes light travel in curved paths and must be solved numerically.

On a completely different note, the paper “Polygon visibility ordering via Voronoi diagrams” revisits one of the oldest problems in computer graphics, which is determining the visibility of the polygons contained in a scene, based on an initial decomposition of the scene into Voronoi cells. The performance of the algorithm was found to be faster than BSP trees.

The last two papers are related to animation: in “Dynamics-based analysis and synthesis of human locomotion” the authors present a method for evaluating the dynamics correctness of retargeted and interpolated locomotions obtained from motion capture, while additionally proposing a way to improve the initial database. Last but not least, the work presented in “Automatic expressive deformations for implying and stylizing motion” takes skeleton-driven 3D computer animations and deforms the character geometry in an expressive way. It is based on the animation concepts of line of action and line of motion, thus bridging the gap between computer animation and traditional animation in an automated way.

These seven papers represent extended versions of selected papers presented in ACM GRAPHITE 2006, the 4th International Conference on Computer Graphics and Interactive Techniques in Australasia and Southeast Asia, held in Kuala Lumpur, Malaysia (29 Nov.–2 Dec. 2006). The papers were selected based on the scores received in the original reviews and their suitability to the journal. The authors were asked to extend their work and submit it to this issue. Each submission was then peer-reviewed following the usual process to ensure quality and soundness, while making sure there was a clear new contribution over the previous publication. We believe that the selection of papers included in this issue covers a wide range of exciting topics for the graphics community. Enjoy reading them!



DIEGO GUTIERREZ is an Assistant Professor at the University of Zaragoza (UZ), Spain, where he received his Ph.D. in Computer Science, earning the Ph.D. Extraordinary Award at UZ. He joined the University's Advanced Computer Graphics Group in 1996. He is (or has been) a member of several committees, including Eurographics, the SIGGRAPH sketches programme, Pacific Graphics and other ACM or EG-related conferences; he was also co-chair for ACM GRAPHITE 2006. His areas of interest include computational photography, global illumination, high dynamic range and perception. He has published more than sixty papers in international conferences and journals.



SITI MARIYAM SHAMSUDDIN is an Associate Professor at the Universiti Teknologi Malaysia. She received her Bachelor and Master degrees in Mathematics and Ph.D. in Artificial Intelligence. Her research interests include moment functions, soft computing and pattern recognition, surface reconstruction and soft computing in computer graphics. She has published more than eighty papers in international conferences and journals related to her field of interest. Currently she is the Head of the R&D Cluster Electronics and ICT, at the Research Management Centre, Universiti Teknologi Malaysia.