SIGGRAPH 2000 Course 27 Notes
Approaches for Procedural Shading on Graphics Hardware

Course Abstract:

Procedural shading, long valued for off-line rendering and production animation, is just becoming possible on interactive graphics hardware. This course covers several approaches for doing procedural shading on current and future graphics hardware. Eight different approaches will be presented in depth. These range from full procedural shading on advanced specialized hardware to limited, yet still surprisingly flexible shading on off-the-shelf systems. Participants will see several of the systems in action and will learn the basic techniques in a series of technology overviews. The course will conclude with a panel session allowing the speakers and audience to discuss the relative merits and pitfalls of the different methods.

Speaker Biographies

Marc Olano
> Member of Technical Staff
> SGI

Marc Olano is a member of the technical staff at SGI, where he is investigating advanced shading techniques for current and future graphics hardware. Olano received his Ph.D. in computer science from the University of North Carolina in Chapel Hill under Anselmo Lastra. His dissertation was on a shading language on the PixelFlow graphics system, the first full procedural shading language to run on graphics hardware. He has also done work in shading models, rendering algorithms, model simplification and scientific visualization.

John C. Hart
> Associate Professor
> School of EECS
> Washington State University

John C. Hart is collaborating with Evans & Sutherland on API specifications and hardware designs to support real-time procedural shading and texturing. He has also worked on a variety of computer graphics projects at the NCSA, the IBM TJ Watson Research Center, AT&T Pixel Machines, The Kleiser-Walczak Construction Company, and VIFX. He is an Associate Professor in the School of Electrical Engineering and Computer Science at Washington State University, and Interim Director of its Image Research Laboratory. Hart received his B.S. in Computer Science from Aurora University, and his M.S. and Ph.D. in Computer Science from Electronic Visualization Laboratory at the University of Illinois at Chicago. Hart served on the ACM SIGGRAPH Executive Committee from 1994 to 1999, and is an Executive Producer of the feature-length HDTV documentary "The Story of Computer Graphics."

Wolfgang Heidrich
> Post-Doc
> Graphics Group
> Max-Planck-Institute for Computer Science

Wolfgang Heidrich is a Research Associate at the newly founded Graphics Group of the Max-Planck-Institute for Computer Science in Saarbrucken, Germany, where he chairs the activities on image-based and hardware-accelerated rendering. He received a PhD in Computer Science from the University of Erlangen this April, a Master of Mathematics from the University of Waterloo in 1996, and a Diploma in Computer Science from the University of Erlangen in 1995. His research interests include hardware-accelerated and image-based rendering, global illumination, and interactive computer graphics.

Michael McCool
Assistant Professor
Computer Science
University of Waterloo Graphics Group

Michael McCool graduated in 1989 from the University of Waterloo with a B.A.Sc. in Computer Engineering and a Mathematics Option. As an undergraduate he worked in both the VLSI Group within Electrical Engineering and in the Porous Media Group in Chemical Engineering at the University of Waterloo. After a short contract with ISG Technologies working on medical visualization and radiologist assistance systems, he completed his M.Sc. and Ph.D. in 1991 and 1994 (officially 1995), respectively, with the Dynamic Graphics Project at the Department of Computer Science, University of Toronto. His supervisor was Eugene Fiume. During his time in Toronto Michael served on the executive (both as Treasurer and Chairman) of the ACM Toronto SIGGRAPH. He is currently an Assistant Professor in the Computer Graphics Lab within the Department of Computer Science at the University of Waterloo.

Bill Mark
Research Associate
Computer Graphics Laboratory
Stanford University

Bill Mark is a research associate in the computer graphics laboratory at Stanford University. He is co-developing a system for real-time programmable shading, and is the project manager for the Stanford Immersive Television project. He received his Ph.D. from the University of North Carolina in May 1999. At UNC he explored the use of image-based rendering techniques to accelerate conventional rendering ("post-rendering warping"). He has also co-developed a software library for force-feedback devices, and taught a one-semester undergraduate course in computer architecture and implementation.

Kekoa Proudfoot
Student
Computer Graphics Laboratory
Stanford University

Kekoa Proudfoot is a Ph.D. student in the Computer Graphics Laboratory at Stanford University. He is currently co-developing a real-time programmable shading system, and has previously worked on simulation and analysis techniques for graphics architectures.