TECHNISCHE UNIVERSITÄT WIEN
Institut für Computergraphik und Algorithmen
Arbeitsbereich für Computergraphik

OESTERREICHISCHE COMPUTER GESELLSCHAFT
AUSTRIAN COMPUTER SOCIETY

laden gemeinsam zum

GASTVORTRAG

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"The Next Challenge for Visibility Algorithms: Interactive Sound Rendering"

Abstract:
Visibility algorithms have been extensively studied in computer graphics and geometric computation. They are primarily used for visible surface computation and global illumination and current GPUs have offer good support to perform visility computations at image-space accuracy. In this talk, we outline the next major challenge in terms of designing fast visiblity algorithms for sound rendering. The main goal is to compute all propagation paths from the source to the listener that take into account reflection and diffraction computations with the objects in the scene.

We give an overview of our recent work on three type of visibility algorithms. Firstly, we present ray-frustum tracing, that is used to trace volumetric frusta for real-time sound propagation in dynamic scenes. Next, we describe the practical and robust algorithms for conservative object-space visibility computation in complex models and use them to accurately compute specular reflection paths. Finally, we describe object-space region-based visibility algorithms for accurate computation of edge diffraction. We highlight the performance of these algorithms on complex models and show that they map well to current multi-core GPUs.

Joint work with faculty and students of GAMMA group at UNC Chapel Hill.

Biography:
Dinesh Manocha is currently the Phi Delta Theta/Mason Distinguished Professor of Computer Science at the University of North Carolina at Chapel Hill. He received his Ph.D. in Computer Science at the University of California at Berkeley 1992. He has received Junior Faculty Award, Alfred P. Sloan Fellowship, NSF Career Award, Office of Naval Research Young Investigator Award, Honda Research Initiation Award, Hettleman Prize for Scholarly Achievement. Along with his students, Manocha has also received 12 best paper & panel awards at the leading conferences on graphics, geometric modeling, visualization, multimedia and high-performance computing. He is an ACM Fellow.

Manocha has published more than 280 papers in the leading conferences and journals on computer graphics, geometric computing, robotics, and scientific computing. He has also served as a program committee member and program chair for more than 75 conferences in these areas, and editorial boards of many leading journals. Some of the software systems related tocollision detection, GPU-based algorithms and geometric computing developed by his group have been downloaded by more than 100,000 users and are widely used in the industry. He has supervised 18 Ph.D. dissertations.

Datum: 27. April 2010 13:30 Uhr s.t.
Ort: TU Wien, Favoritenstr. 9, Stiege 1, 5. Stock, Seminarraum E186