TECHNISCHE UNIVERSITÄT WIEN
Institut für Computergraphik und Algorithmen
Arbeitsbereich für Computergraphik

vrvis zentrum für virtual reality und visualisierung forschungs-gmbh

OESTERREICHISCHE COMPUTER GESELLSCHAFT
AUSTRIAN COMPUTER SOCIETY

laden gemeinsam zum

GASTVORTRAG

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"Virtual Urbanscape: Recent Advances, Challenges & Opportunities"

Abstract:

Recent advances in scanning, modeling, rendering, and hardware make it possible to generate nearphotorealistic images of moderately complex scenes at interactive rates. One of the next grand challenges in computer graphics and visualization is to model vibrant, dynamic scenes of realworld complexity, such as urban spaces. The problem of modeling virtual cityscapes offers a diverse set of opportunities for innovations and provides enabling technologies of societal interests, including energy use, transportation mechanisms, economic sustainability, education and entertainment. Some of the key research issues include interactive simulation of large-scale crowds, realistic modeling of complex traffic flows, efficient motion synthesis of plausible pedestrian behaviors and natural phenomena. At least one to two orders of magnitude performance improvement in hardware will be needed. New algorithms and software systems that can exploit such computing power must be developed.

In this talk, I will survey some of recent efforts on addressing the problem of modeling, simulating, and directing virtual agents in complex dynamic environments. In particular, I will present several complementary approaches for representing movement of multiple virtual entities, including both crowds and traffic, in urban scenes and city highways. I will further highlight the design of scalable algorithms for these problems by taking advantages of parallelism available on emerging commodity hardware, such as GPUs and many-core processors. These methods can be applied to interactive crowd simulation, motion synthesis, and coordination of multiple autonomous agents in computer games and virtual environment systems. I will conclude by discussing our experiences and some future research directions on incorporating sound effects and natural phenomena.

Biography:

Ming C. Lin is currently John R. & Louise S. Parker Distinguished Professor of Computer Science at the University of North Carolina (UNC), Chapel Hill and an honorary Chair Professor (Yangtze Scholar) at Tsinghua University in China. She obtained her B.S., M.S., and Ph.D. in Electrical Engineering and Computer Science from the University of California, Berkeley. She received several honors and awards, including the NSF Young Faculty Career Award in 1995, Beverly W. Long Distinguished Professorship 2007-2010, IEEE VGTC Virtual Reality Technical Achievement Award in 2010, and nine best paper awards at international conferences. She is a Fellow of ACM and IEEE. Her research interests include physically-based modeling, virtual environments, sound rendering, haptics, robotics, and geometric computing. She has (co-)authored more than 250 refereed publications in these areas and coedited/authored four books. She has served on over 130 program committees of leading conferences and cochaired dozens of international conferences and workshops. She is currently a member of IEEE Computer Society (CS) Board of Governors and the Chair of IEEE CS Transactions Operations Committee. She is a former Editor-in-Chief of IEEE Transactions on Visualization and Computer Graphics, a member of 6 editorial boards, and a guest editor for over a dozen of scientific journals and technical magazines. She also has served on several steering committees and advisory boards of international conferences, as well as government and industrial technical advisory committees.

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