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CCT Colloquium Series

Physics-based Modeling, Dynamic Simulation, and Applications

Hong Qin, Stony Brook University

Professor

 Johnston Hall 338
 March 06, 2009 - 11:30 am

Abstract:

During the last two decades, Physics-based modeling and dynamic simulation have emerged from novel computational tools to become ubiquitous in computer graphics, computer-aided engineering, visual computing with a large variety of applications. In this talk, I will concentrate on Digital Clay, which is a novel and powerful data modeling, simulation, analysis, and processing paradigm for information technologies. At the geometric modeling level, my talk will focus on mesh-free, point-sampled geometry. At the computational physics level, I will demonstrate how physics can be integrated with point geometry for interactive simulation and animation for visual computing. Key applications include shape deformation based on the thin-shell finite element formulation, crack generation and propagation. Other applications in physics-based shape morphing, real-time free-form deformation, dynamic surface reconstruction/editing, haptic sculpting and painting, interactive sketching, and surface completion will also be presented. Besides mathematical formulations for both point geometry and physical laws, many video clips will be shown to demonstrate the efficacy of our point-based graphics system throughout my talk. Time permitting, I will briefly talk about our current and on-going research work in visual computing and highlight their new application potentials in medical imaging and simulation, reverse engineering, cyber-physical interface, and digital media.

Speaker's Bio:

Professor Hong Qin is a full professor of Computer Science in Department of Computer Science at State University of New York at Stony Brook (Stony Brook University). He received his B.S. degree and his M.S. degree in Computer Science from Peking University. He received his Ph.D. (1995) degree in Computer Science from the University of Toronto. He was a recipient of NSF CAREER Award from the National Science Foundation (NSF), Honda Initiation Award, and Alfred P. Sloan Research Fellow by the Sloan Foundation. Currently, he is an associate editor for IEEE Transactions on Visualization and Computer Graphics (IEEE TVCG), and he is also on the editorial board of The Visual Computer and The Journal of Computer Science and Technology. In recent years, he has chaired many international conferences including Computer Graphics International, ACM Solid and Physical Modeling Symposium, IEEE International Conference on Shape Modeling and Applications, International Conference on Computer Animation and Social Agents, etc. His research interests include geometric and solid modeling, graphics, physics-based modeling and simulation, computer aided geometric design, human-computer interaction, visualization, and scientific computing. For more details, please visit <http://www.cs.sunysb.edu/~qin>

Refreshments will be served.
This lecture has a reception.
