The Human Side of Visualization

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Abstract

Visualization and virtual reality are currently used as day-to-day tools in many disciplines. From product design to understanding how a cell functions, from simulations of colliding black holes to evaluations of architectural structures, from well planning for oil exploration to visualization of material strength under pressure, visualization and virtual reality have proven valuable technologies to aid scientists, engineers and other practitioners to gain a better understanding of the problem or situation under study. Furthermore these professionals are facing increasingly larger and more complex problems that generate massive amounts of data, therefore being harder and harder to understand such data without visualization support.

So, how can we explain this to groups that are trying to find value on these technologies for their work? This may seem a trivial question, but when research leaves the research labs and it is deployed into industry, we need to be able to clearly characterize and quantify its value. This presentation discusses a 12-year span of research investigating ways to explain the value of virtual reality technology, its effects in users, and potential limitations due to current available underlying technologies. The presentation will show lessons learned as well as success stories on introducing this technology into industrial groups. The presentation will wrap up with an introduction to the Louisiana Immersive Technologies Enterprise (LITE), a summary of its economic development activities that bridge visualization research and production, and how the experiences on evaluating the technology are being put to practice.

Speaker Bio-Sketch: Carolina Cruz-Neira is a pioneer in virtual reality having been the developer of the original CAVE system and several of the most popular software middleware for application development in virtual reality and supercomputing. She is the Executive Director and Chief Scientist of the Louisiana Immersive Technologies Enterprise (LITE). She is also an Endowed Chair in the Computer Engineering and the Center for Advanced Computer Studies departments of the University of Louisiana at Lafayette. Until March 2006, Dr. Cruz was the Stanley Chair in Interdisciplinary Engineering at Iowa State University. From 2000 until 2005 she was the Associate Director of the Virtual Reality Applications Center at Iowa State University. In 1997 she was featured by Business Week magazine as a "rising research star" in the new generation of computer science pioneers. In March of 2000 Dr. Cruz received the Iowa State Foundation Award for Early Achievement in Research. In June 2001 she received the Boeing A.D. Welliver Award. In 2002 she was named Eminent Engineer by the Tau Beta Pi Honors Society. In 2003 she was inducted as a Computer Graphics Pioneer by the ACM SIGGRAPH organization. Her research has been driven by designing software architectures that provide applicability and simplicity for complex visualization systems. Dr. Cruz completed her doctoral studies in Electrical Engineering and Computer Science (EECS) at the Electronic Visualization Laboratory (EVL) at the University of Illinois at Chicago in May 1995. Her Ph.D. dissertation included the design of the CAVE(TM) Virtual Reality Environment, the CAVE Library software specifications and implementation, and preliminary research on CAVE-Supercomputing integration. In 1991 she received a Master's degree in EECS at EVL at the University of Illinois at Chicago and graduated Cum Laude in Systems Engineering at the Universidad Metropolitana at Caracas, Venezuela in 1987.