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Visualizing Ultra-Scale Data

Kwan-Liu Ma Institute for Ultrascale Visualization University of California, Davis

Abstract

Advanced computing and imaging technologies enable scientists to study natural phenomena at unprecedented precision, resulting in an explosive growth of data. The size of the collected information about the Internet and mobile device users is expected to be even greater, a daunting challenge we must address in order to make sense and maximize utilization of all the available information. Visualization transforms large quantities of, possibly multiple-dimensional, data into graphical representations that exploit the high-bandwidth channel of the human visual system, leveraging the brain's remarkable ability to detect patterns and draw inferences. It has thus become an indispensable tool in many areas of study involving large data. I will introduce several effective solutions to the large data visualization problems found in a variety of areas from physical science, security, to software development.



Speaker Bio-Sketch: Dr. Kwan-Liu Ma is a professor of computer science at the University of California-Davis, and leads the VIDI (Visualization and Interface Design Innovation) research group. He also directs the DOE SciDAC Institute for Ultrascale Visualization. His research spans the fields of visualization, high-performance computing, and user interface design. Professor Ma received his PhD in computer science from the University of Utah in 1993. During 1993-1999, he was with ICASE/NASA LaRC as a research scientist. In 1999, he joined UC Davis. In the following year, Professor Ma received the Presidential Early Career Award for Scientists and Engineers (PECASE) for his work in parallel visualization. In 2001, he received the Schlumberger Foundation Technical Award for his work in large data visualization. In 2007, he received the College of Engineering's Outstanding Mid-Career

Research Faculty Award. Professor Ma actively serves the research community by playing leading roles in the 2005 NSF Workshop on Cyber Security, SC06 and SC07 Workshop on Ultrascale Visualization, 2007 Asia-Pacific Symposium on Visualization, 2008 Pacific Visualization Symposium, and 2008 Eurographics Symposium on Parallel Graphics and Visualization. Professor Ma also serves on the editorial boards of the IEEE Computer Graphics and Applications and the IEEE Transactions on Visualization and Graphics.