Colloquium

Department of Computer Science

Dr. Hui Zhang

Hui Zhang is a researcher with Pervasive Technology Institute at Indiana University, where he also holds adjunct faculty appointment with Indiana's Cognitive Science Program. He received the BS and MS degrees in computer science and engineering from Zhejiang University, China, and the PhD degree in computer science from Indiana University, Bloomington. His research interests include scientific visualization, user interfaces and interaction, and big data visualization. He has designed, implemented, and evaluated a number of algorithms and techniques to visualize large data from scientific investigations and simulations. His mathematical software "KnotExplore" received honorable mention prize in the 2005 SensAble 3D Touch Developer Challenge. He has been publishing his work in IEEE TVCG, IEEE Visualization Conference, SPIE JEI, and IEEE BigData Conference.

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Large-scale Scientific Investigation with Visual Informatics and Data-Intensive Computing

Abstract

We are generating digital data routinely from many areas of science and engineering in unprecedented scales and details. Unlike a traditional task, a large-scale scientific investigation calls for new techniques and tools to create images to communicate the essential information inherent in these large and complex data, and this often requires quantitative analyses and computing at different scales. If appropriately designed, visually based information can be used to effectively direct the overall large-scale analysis process. In this talk I will discuss how I, along with my collaborators, have been marrying what we loosely term 'visual informatics', including visualization methods and interactive techniques, etc., with data-intensive scalable computing. I will discuss two case studies, one for large-scale dental computing and the other one for the visualization of high-dimensional geometric data, to show how visual informatics and scalable computing are coupled and can work hand in hand for large-scale scientific investigations. Finally, I will discuss my vision for the evolution of these techniques into a framework deployed on cyber-infrastructure for the alliance of domain knowledge from human experts and computing powers of machines, to empower the future of scientific investigations.