

Large Data Management, Analysis and Visualization

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Abstract

The advance in ultra-scale computing technology allows experiments and simulations to produce extreme scale data that has to be managed and analyzed in a timely manner. The data, on the order of terabytes or petabytes, places a big challenge for collaborative research done by geographically distributed teams of scientists. Large scale data management has become a critical research focus for numerous ultra-scale simulation projects. It plays an important role in transforming extreme scale data into scientific insights.

Although intensive research has been undertaken on large scale data visualization and analysis, developing an integrated solution for large data management is equally important in order to speed up the whole process of scientific discovery. The enormous growth in size and complexity of scientific simulation data requires such a solution to be scalable and easily accessible by scientists worldwide.

In this talk, Dr. Gao will highlight some of her work in large data management, analysis and visualization. This will include her work on scalable data culling algorithms proposed for parallel and distributed environments. In addition, she will present her distributed large data management middleware, which dynamically accesses and streams a minimally necessary subset of any given data to any user requesting an interactive visualization session. This middleware is effective in supporting remote users and is currently under being used to develop support for collaborative data analysis and visualization.



Dr. Jinzhu Gao received the PhD degree in computer science from the Ohio State University in 2004. From June 2004 to August 2006, she was a research associate at the Oak Ridge National Laboratory. She joined the University of Minnesota, Morris, in 2006, and the University of the Pacific in 2008 as an assistant professor in computer science. Her main research focus is on large data management, analysis and visualization for collaborative science. Over the past ten years, Dr. Gao has been working closely with application scientists to study the design of an integrated large scale data management scheme that helps advance scientific discovery and collaboration.