机器感知与智能教育部重点实验室学术报告
科学与工程计算中心计算科学学术报告

北京大学 PEKING UNIVERSITY

DStep - Extracting Spatiotemporal Features in Large Scientific Data at Scale

1:00 p.m. Wednesday, May 9th, 2012
Room 2736, Science Building No. 2

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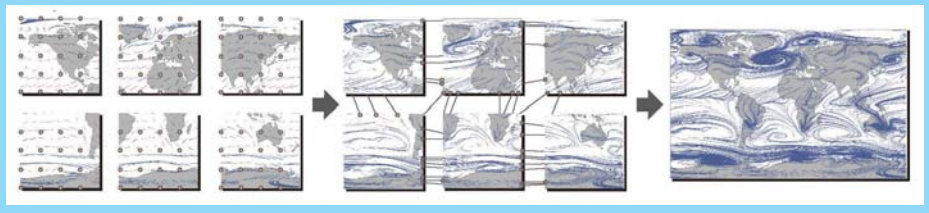
The University of Tennessee, Knoxville

Many data-intensive scientific analysis techniques require global domain traversal, which over the years has been a bottleneck for efficient parallelization across distributed memory architectures.

Inspired by MapReduce and other simplified parallel programming approaches, we have designed DStep, a flexible system that greatly simplifies efficient parallelization of domain traversal techniques at scale. In order to deliver both simplicity to users as well as scalability on HPC platforms, we introduce a novel two-tiered communication architecture for managing and exploiting asynchronous communication loads. We also integrate our design with advanced parallel I/O techniques that operate directly on native simulation output. We demonstrate DStep by performing teleconnection analysis across ensemble runs of terascale atmospheric CO2 and climate data, and we show scalability results on up to 65,536 IBM BlueGene/P cores.

We have also integrated visual analytics methods into our approach by providing users with an interactive interface to procedurally and interactively describe and extract high-level flow features. We showthe generality and expressiveness of this method by exploring various phenomena in a large global ocean modeling simulation.



Jian Huang is an associate professor in the Department of Electrical Engineering and Computer Science and also associate director of the NSF Remote Data Analysis and Visualization Center at the University of Tennessee, Knoxville. His research focuses on large data visualization, multivariate visualization, and parallel, distributed and remote visualization. He received a Ph.D. degree in computer science from the Ohio State University in 2001.

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地点：北京大学理科2号楼 2736