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LSU CCT to Showcase Computational Applications at Supercomputing 2011 in Seattle

Louisiana State University's Center for Computation & Technology, or LSU CCT, will present research enabled through high-performance computing systems, high-speed networking, advanced software, and innovative computational applications during the annual Supercomputing Conference, Nov. 12-18, 2011 in Seattle, Washington.

The Supercomputing Conference, which originated in 1988, is the premier international conference on high-performance computing, networking, storage, and analysis. CCT will host a booth during the exhibition portion of the conference, Nov. 14-17, that will feature different research projects that are being conducted at LSU through HPC. Topics include: LASIGMA (the Louisiana Alliance for Simulation-Guided Materials Applications program); coastal research and cyberinfrastructure; the CRON program (Cyberinfrastructure of Reconfigurable Optical Networking); the Nature Collaboration; STE||AR (Systems, Technologies, Emergent Parallelism, and Algorithms Research); UCoMS (the Ubiquitous Computing and Monitoring System project); the CACTUS toolkit; and compilation and code generation research.

The LSU Booth (#2839) will also display three demos during the exhibition.

1) A distributed adaptive mesh refinement demo with interactive power management and fault tolerance will be shown in realtime, allowing users to interactively change the power available and watch the resulting change in flops. The user can also interactively kill cores without destroying the simulation.

2) A symmetric contact demo in 3-D will allow the user to explore colliding various projectiles in realtime simulation and directly compare simulations with and without global barriers. The user can supply the contact configuration, velocity, and material.

3) A computational biology applications demo running on multiple cloud computing infrastructures will show multiple cloud computing data centers that are connected by a 10 Gbps virtual networking environment created by CRON. In addition, the demo will show how data and computing intensive computational biology applications, such as a high throughput sequencing tool (Cloudburst) and a high throughput docking tool (AutoDock), can use heterogenous and remote cloud computing physical resources, which will be transformed into a set of virtual physical resources by Eucalyptus and MapReduce framework.

In addition to the exhibition activities, Kathryn Traxler, CCT education and outreach specialist, and Tyler Longwell, LSU sophomore student, will be participating in the SC11 Education Program's LittleFe Buildout Event. LittleFe is a portable mini-cluster which is small enough to fit in a shipping case. The buildout will feature v4 LittleFe units; this design utilizes dual-core Intel® Atom™ processors with NVIDIA ION2 chipsets that support CUDA/OpenCL programming. Each buildout will consist of participants assembling their LittleFe unit from a kit, installing the Bootable Cluster CD (BCCD) software on it, learning about the curriculum modules available for teaching parallel programming, HPC and/or CDESE, and learning how to develop new curriculum modules for the LittleFe/BCCD platform.

Professors Thomas Sterling and Steven Brandt will be presenting a tutorial titled Basics of Supercomputing on November 18th. This is 'THE' crash course on supercomputers for everyone who knows almost nothing but wants to come up to speed fast. All the major topics are described and put into a meaningful framework including supercomputer architecture and systems, parallel programming approaches and methods, tools for usage and debugging, and classes of applications. But also presented will be the basic HPC lexicon, the players in the community, the products leading the way, and what's likely to come next.

Overall, CCT continues to be active in planning the Supercomputing Conference by filling important committee roles. This year's committee members are: Steven Brandt (deputy chair of tutorials) & Terrie Bordelon, tutorials committee; Kathryn Traxler, education committee; and Shantenu Jha and Daniel Katz, technical program committee/storage (clouds/grids).

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