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Search

| Home | About ▼ | Focus Areas ▼ | Research ▼ | Divisions ▼ | Programs ▼ | News ▼ | Events ▼ | Computing Resources ▼ | Jobs | Contact Us | | Log In | LSU ▼ |

CCT Weekly September 4- September 10, 2011

CCT Weekly September 6, 2011

LSU CCT Researchers Explore Enhanced Scalability for Accelerated ParalleX Computing

Over the next decade, scalability of many applications on current and future parallel computer architectures is critical to the fundamental advancement of science and exploitation of technology, both in the regime of strong scaling (the reduction of execution time for fixed size problems) and Exascale computing. Among the strategic challenges to dramatic extensions of scalability, important to future use of both multicore and GPU architectures, is the exposure and exploitation of new forms of parallelism and the concomitant reduction in overheads for effective finer-grained parallelism execution.

LSU IT Consultant Hartmut Kaiser, along with LSU Professor Thomas Sterling, both from the LSU Center for Computation & Technology (CCT), have been awarded funding from the National Science Foundation for the project, "Computer Systems Research: Small:

Accelerated ParalleX for Enhanced Scaling Adaptive Mesh Refinement Based Science." The amount of $474, 024 was awarded for a three-year term.

This accelerated ParalleX project will be driven by a single application domain--numerical relativity. Numerical relativity exhibits the challenges to scaling and its advanced class of parallel algorithms--adaptive mesh refinement that provides superior execution properties with respect to uniform grid representations.

Accelerated ParalleX will explore the opportunity of employing field-programmable gate array technology in otherwise standard commodity clusters of SMP nodes to reduce key spruces of runtime overhead of the ParalleX HPX (or high-performance ParalleX) runtime system. Specific areas of pursuit include global address space and translation, thread instantiation and context switching, active message creation and processing, and atomic memory operations, among others.

The HPX runtime system represents a first attempt to develop a comprehensive application programming interface for the ParalleX execution model. This hardware support will augment optimized software services to improve efficiency in available parallelism.

"This research is motivated by the duel challenge of applications that through conventional practices either are presently unable to effectively exploit a relatively small number of cores in a multi-core system or that by the end of this decade will not be able to exploit Exascale computing systems likely to employ hundreds of millions of such cores," said Kaiser. "It will develop a deeper understanding of the interrelationship of system hardware and software for new execution models and will devise a new working system and a useful hybrid hardware/software prototype system performing real-world science and applications."

"Long term, future ASIC (application-specific integrated circuit) designers of processors and systems will be able to dramatically extend scalability of graph-based problems, including adaptive mesh refinement," said Kaiser.

For more information on this and other research at the LSU Center for Computation & Technology, visit: http://www.cct.lsu.edu.

Lectures this week:

Tuesday –
There will be a Computational Mathematics Seminar Series lecture on "Computational Mathematics Research Summaries." Faculty members in the computational mathematics group (Blaise Bourdin, Susanne Brenner, Li-Yeng Sung, Shawn Walker, Xiaoliang Wan and Hongchao Zhang) will give short presentations on their current research. The lecture will take place Tuesday, September 6 at 3:30 PM in 338 Johnston Hall.

CCT in the news:
Entering the Digital Society
LSU's Digital Media Center will usher us into the future
Source: Dig Baton Rouge Uncovered

Please Note:

•   The 2011 ACM ICPC South Central USA Regional Programming Contest is now accepting team entries for the October 28 and 29th event. The ACM International Collegiate Programming Contest (ICPC) provides college students with opportunities to interact with students from other universities and to sharpen and demonstrate their problem-solving, programming, and teamwork skills. The contest provides a platform for ACM, industry, and academia to encourage and focus public attention on the next generation of computing professionals as they pursue excellence. The contest is a two-tiered competition among teams of students representing institutions of higher education. Teams first compete in regional contests held around the world from September to November each year. The winning team from each regional contest qualifies to advance to the ACM International Collegiate Programming Contest World Finals, typically held the following March to mid-April. Additional high-ranking teams may be invited to the World Finals as wild card teams. Fees are $125.00 per team if registered prior to October 10, 2011. Registration fees are for a team of three members and one coach. Guests and alternates are an additional $30 each. (See complete registration rules at: http://icpc.baylor.edu/icpc/regionals/About.htm). The South Central USA Regionals will take place on October 28 and 29th at:
o   Louisiana State University, Baton Rouge, Louisiana
o   La Tourneau University, Longview, Texas
o   East Central University, Ada, Oklahoma
For more information, or to register a team, visit: http://icpc.baylor.edu/icpc/regionals/.

•   **Post Your Part-time Jobs for FREE through Careers2Geaux:**

Now that school is back in session, our students looking for part-time jobs. Through Careers2Geaux, you may post any position type, including your part-time opportunities, for FREE! This system is password-protected and available to LSU students, faculty, staff, and registered alumni 24 hours a day, seven days a week. To list your position(s) in Careers2Geaux, click the Careers2Geaux link https://lsu-csm.symplicity.com/employers and follow the instructions for creating an account. Once you enter the information for your position, the status of your posting will remain "pending" until reviewed by a staff member. Open positions are posted for 45 days. If you have any questions, please contact Amy Caillouet, Administrative Coordinator, at 225-578-2162 or email at amyc@lsu.edu.

•   Submissions for the 2012 Red Stick International Animation Festival are now being accepted. Visit

News

Press Releases
Event Announcements
CCT Weekly
Grants and Funding
Student News
Archived News

http://www.redstickfestival.org/competition/submissions/ for details.

• TechX2011 will be held October 5-7 at the Baton Rouge River Center. The concept behind TechX 2011 is simple - bring together the entire technology and telecommunications buying and decision making community, and provide them with network marketing and education to show them how many great companies are right here in the Gulf Coast Region. Registration is FREE! For more information and to register, visit http://www.techx2011.com/

• Save the date! Louisiana EPSCoR is hosting the greatly anticipated National Science Foundation workshop, Science: Becoming the Messenger, on November 17, 2011, at the Baton Rouge Marriott. The 1-day workshop provides targeted communications training to Researchers, Faculty & Postdocs, Students, Public Relations Officers and Communicators. The NSF's Office of Legislative and Public Affairs has assembled a team of nationally renowned communicators to provide this training. Participants will learn how to craft a message and communicate with a variety of audiences, explore new media, pick up live camera interview skills and more. There is no registration fee to attend but pre-registration is required. Registration details to come soon!

• Prior approval is required for Special Meal Requests. Employees who make meal purchases without prior approvals may find that they must cover the cost of any monies spent for an unapproved event out of pocket. Dine-in restaurant meals are not allowed on LaCarte credit cards. Please contact Susie McGlone (susie@cct.lsu.edu) prior to any special meal with visitor(s) to file the appropriate request for approval. Prior approval could take up to two weeks, so please plan accordingly.

• Please remember to send your news concerning grants, awards, conferences, or other pertinent information to CCT Event Coordinator Jennifer Fontenot at jennifer@cct.lsu.edu

• Follow CCT with social media to access photos and see news, events or updated information. These pages are public; you do not need an account to view the information.
o   Facebook group : LSU Center for Computation & Technology
o   Twitter : LSUCCT
o   YouTube channel : LSUCCT

Interest groups:
• **MAG (Mobile App-Art-Action Group):** Inaugural meeting is **Wednesday, Sept 7th** @ 5:00 pm in 338 Johnston. After the successful conclusion of the LSU CCT's first ever iOS Bootcamp, we will kick off the academic year with the inaugural MAG (Mobile App-Art-Action Group]. Everyone interested in the potential for Mobile Apps is invited to come and add their vision for these revolutionary devices. For more information, visit http://www.cct.lsu.edu/site.php?pageID=63&newsID=1402. Contact: Jesse Allison (jtallison@lsu.edu)

• **GPU:** meets weekly (**Thursdays** @ 2:00 pm in 338 Johnston) and encourages participation from anyone who would like to join in the discussions. Contact: Bhupender Thakur (bthakur@cct.lsu.edu)

Upcoming events:
September 6-8: "Social Structure" Interactive AV Performance
September 7: Training: Intro to HPC, Account Allocation/Mgmt
September 7: Inaugural Mobile App-Art-Action Group [MAG] meeting
September 14: Training:Job Management w/ PBS/Loadleveler
October 28-29: ACM ICPC South Central USA Regional Programming Contest

Upcoming Grant Deadlines:
Note: Please check the CCT deadline Web site, since it is updated daily.

Computer and Network Systems (CNS): Core Programs
September 15, 2011 10:00 am
At Most $ 3,000,000.00 available

Information and Intelligent Systems (IIS): Core Programs
September 15, 2011 10:00 am
At Most $ 3,000,000.00 available

Computing and Communication Foundations (CCF): Core Programs
September 15, 2011 10:00 am
At Most $ 3,000,000.00 available

Partnerships for International Research and Education (PIRE)
October 19, 2011 10:00 am
At Most $ 4,000,000.00 available

Sustainability Research Networks Competition (SRN)
December 1, 2011 10:00 am
At Most $ 12,000,000.00 available

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