



CCT Weekly September 11- September 17, 2011

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LSU CCT Explores New HPC Storage Hierarchy

Data intense computations are important for not only for STEM (science, technology, engineering, and mathematics) and commercial applications, but also for emerging knowledge management and understanding of the computational problems of tomorrow. The uncertainties of access latency times combined with overheads and the need to exploit data-access parallelism for throughput require a new strategy to enable persistent storage in the Exascale era.

IT Consultant Maciej Brodowicz, along with Professor Thomas Sterling, both with the LSU Center for Computation & Technology, received a two-year, \$299,998 award from the National Science Foundation for their project, "Dynamic Data Path Management for Asynchronous Vertical Storage Hierarchy."

The research will forge new understanding, concepts, and methods for realizing advanced, persistent storage management and processing. Two innovative system classes, one an advanced parallel file system, PVFS2, and the other a unique execution model, ParalleX, will be merged as an exploratory vehicle for establishing a new paradigm for mass storage at extreme scale.

"A new relationship between ephemeral storage and persistent objects is necessary to unify their association and manage the asynchrony of operation while achieving high efficiency. This project will develop a new paradigm of computation that integrates these abstract and physical requirements of persistence in combination with execution in a single model," said Brodowicz.

A new execution model will achieve two goals. First, it will unify the semantics of ephemeral and mass storage to support a single abstraction of data manipulation, and incorporate an integration of metadata and synchronization to manage asynchrony and uncertainty of response time as well as logical conflicting accesses. Second, it will also support dynamic data path management for asynchronous vertical storage hierarchy, removing the burden from the users for programmability and exploiting adaptive runtime, event-driven techniques for enhanced efficiency and scalability.

"As high performance computing systems grow in complexity, so does their memory hierarchy," said Brodowicz. "The management of vertical transport of data from secondary storage through non-volatile random-access memory, distributed main memory, layers of cache and scratch pad memories and register sets demands innovation providing a single strategy of dynamic control of the entire data path in the context of asynchrony. ParalleX, an experimental execution model, will be extended to embrace secondary storage through a unification of semantics of execution data and persistent objects."

Clemson University will conduct a complementary project. Combining the research from LSU with that of Clemson will permit early experimentation and testing of these important but unproven concepts.

For more information on this or 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 "[Mathematical Modeling for HIV-1 Gag Protein Trafficking and Assembly](#)" by Jiangguo Liu. The lecture will take place Tuesday, September 13 at 3:30 PM in 338 Johnston Hall.

Please Note:

- As we prepare the contents for CCT's 7th Components magazine, we'd like to encourage you to submit any relevant "pats on the backs" which occurred between Fall 2010 and Summer 2011 for the Highlights page. These would include awards, keynotes, special recognitions, etc. Deadline to submit is Sept. 15. Please send the information to Jennifer Fontenot (jennifer@cct.lsu.edu)
- 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
 - Louisiana State University, Baton Rouge, Louisiana
 - La Tourneau University, Longview, Texas
 - 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 Caillout, 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 thru January 6th. Visit <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):** Everyone interested in the potential for Mobile Apps is invited to come and add their vision for these revolutionary devices. Meetings are schedule October 5th, November 2nd and December 7th , 5:00-6:00 pm. For more information, visit <http://www.cct.lsu.edu/site.php?pageID=63&newsID=1402>. Contact: Jesse Allison (italison@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 14: [Training: Job Management w/ PBS/Loadleveler](#)

October 24-25: Electronic Arts Recruitment @ LSU

October 28-29: [ACM ICPC South Central USA Regional Programming Contest](#)

November 12-18: [SC11](#)

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

Publish Date:

09-13-2011

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