INNOVATIVE COMPUTING LABORATORY NEWSLETTER

AUGUST 2010

ICL is Hiring

In addition to a need for graduate student assistants, we also have full time, research job openings in the following areas: linear algebra, performance tuning and evaluation, compiler evaluation, and application modeling and application. For more information, visit the **ICL Employment web page**.

Future Computer Scientists Visit

On July 22nd, we hosted a group of 20 Pre-K up to 5th grade students from the Annoor Academy of Knoxville, who visited as part of their summer camp program. The program has a weekly theme, and that week's theme was science & technology. The visit was arranged by ICL's Hatem Ltaief, whose son Younes attends the academy. After being treated to a pizza lunch, the youngsters were given a tour of Claxton, which included visits to the machine rooms and a visit to Dr. Lynne Parker's robotics lab.

Annoor Academy students in the machine room. (Younes Ltaief is in the red shirt, sitting far right.)

ICL Software Licensing

Licensing information about ICL software is now available from each project's website. Pointers to the license information are located beside the download link for all ICL produced software.

Microsoft Office 2010 Available (kind of)

OIT has secured free licenses for Microsoft Office 2010 for use on UT owned computers. Once the current bug in the installer is resolved, the software will be available via **OIT's software distribution site**.

ICL 2010 Retreat

This year's retreat will be held at the same location as always, Highland Manor Inn in Townsend, but will be August 12-13, before classes begin. A first draft of the agenda can be found **here**.

Jack Interviewed by Next Big Future

Recently interviewed by Sander Olson at nextbigfuture.com, Jack shares his thoughts on the future of extreme scale computing. See the Q & A text at the **Next Big Future website** along with a couple of dated videos of Jack talking about high performance computing.

RECENT PAPERS

Giraud, L., Haidar, A., Saad, Y. **Sparse Approximations of the Schur Complement for Parallel Algebraic Hybrid Solvers in 3D**, *Numerical Mathematics: Theory, Methods and Applications*, Zhiming, C. Beijing, Eds. Vol. 3, No. 3, pp. 64-82, 2010.

Giraud, L., Haidar, A., Pralet, S. **Using MultipleLevels of Parallelism to Enhance the Performance of Domain Decomposition Solvers**, *Parallel Computing*, Bekas, C., d'Ambra, P., Grama, A., Saad, Y., Yanev, P, Eds. Vol. 36, No. 5-6, pp. 285-296, 2010.

Hurault, A., YarKhan, A. **Intelligent Service Trading and Brokering for Distributed Network Services in GridSolve**, *VECPAR 2010*, 9th International Meeting on High Performance Computing for Computational Science, Berkeley, CA, June 22-25, 2010. **PDF**

Kurzak, J., Ltaief, H., Dongarra, J., Badia, R. **Scheduling Dense Linear Algebra Operations on Multicore Processors**, *Concurrency and Computation: Practice and Experience*, Vol. 22, no. 1, pp. 15-44, January, 2010.

Li, Y., YarKhan, A., Dongarra, J., Seymour, K., Hurault, A. **Enabling Workflows in GridSolve: Request Sequencing and Service Trading**, *Journal of Supercomputing* (submitted), 2010. **PDF**

Ltaief, H., Tomov, S., Nath, R., Du, P., Dongarra, J. **A Scalable High Performant Cholesky Factorization for Multicore with GPU Accelerators**. *Proceedings of VECPAR '10*, Berkeley, CA. June 22-25. **PDF**

Nath, R., Tomov, S., Dongarra, J. **An Improved MAGMA GEMM for Fermi GPUs**. *University of Tennessee Computer Science Technical Report* UT-CS-10-655 (also LAPACK working note 227). **PDF**

Song, F., Moore, S., Dongarra, J. **Analytical Modeling and Optimization for Affinity Based Thread Scheduling on Multicore Systems**, *IEEE International Conference on Cluster Computing* (to be presented), Heraklion, Crete, Greece, Sept. 20-24, 2010.

Tomov, S., Nath, R., Dongarra, J. **Accelerating the Reduction to Upper Hessenberg, Tridiagonal, and Bidiagonal Forms Through Hybrid GPU-based Computing**, *Parallel Computing*, June 19, 2010. **PDF**

RECENT CONFERENCES

JUL 1 Paris
SAFE-OS Project Review / Thomas

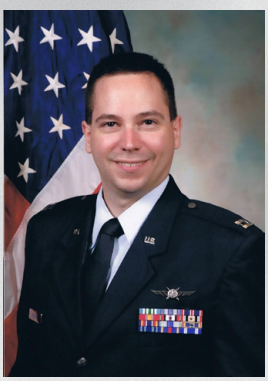
JUL 11 - 15 Chattanooga, TN
SciDAC 2010 / Shirley, Vince **PDF**

JUL 12 - 15 Knoxville, TN
SAAHPC'10 / George, Heike, Piotr **PDF**, Stan

CONTINUED ON PAGE 3

INTERVIEW


1999



Jeremy Millar

ICL 1999-2002

What do you remember most about some of the projects you worked on at ICL?

Lots of things, but what really sticks out are the trips and the people. I learned an awful lot from the folks at ICL – more than I thought at the time. And looking back, I've come to realize what an extraordinary group I was working with. It's pretty rare to see the level of expertise and drive that ICL consistently puts together.

I also learned a lot from the travel and conference presentations and I had the opportunity to see some pretty nice places. I travel plenty now, of course, but the destinations aren't usually as nice as they were with ICL.

Professionally, what all have you done since you left?

When I initially left ICL, I moved downstairs to LoCI Lab to work on high-performance distributed storage systems. That was a lot of fun, and we did some really good work.

In 2004, I left LoCI for the United States Air Force and Officer Training School at Maxwell AFB where I earned a commission as a second lieutenant. After commissioning, I was stationed at Nellis AFB in Las Vegas and assigned to the 99th Communications Squadron. While at the 99th CS, I held positions as a network control center crew commander and operations officer. Later, I was re-assigned to the USAF Weapons School as the executive officer. Nellis was a pretty cool place to be – we supported a variety of combat training operations like Red Flag as well as real-world Predator operations.

In 2007, I was assigned as a student to the Air Force Institute of Technology at Wright-Patterson AFB in Dayton, OH. I spent 18 months earning a master's degree in computer science and doing research in computational linguistics and pattern recognition.

Following graduation in 2009, I was assigned to my current duty station at the Air Force Wargaming Institute, Maxwell AFB. I manage a team of 8 programmers responsible for maintaining air campaign models used for the professional military education of USAF, RAF, RAAF, and Dutch officers.

Additionally, I've been deployed to the Middle East twice – once to Iraq and once to Afghanistan.

What have you taken from your time at ICL that you've been able to apply to your new career?

Lots. Everything from basic technical skills like programming to software engineering to public speaking. I got a lot of practice talking in front of people while I was at ICL and that's been a great help when it comes to giving briefings. The technical piece has been useful as well. A lot of officers are not technically proficient, and it helps to know when your troops aren't quite making sense.

For you, what have been the major differences between working in the military and working in academia?

The obvious difference is the amount of structure. ICL had a very loose structure. It wasn't unusual to see people rolling into the office at 9 or so, and the dress code was certainly less strict.

Tell us some things you miss about TN and working at UT.

Four well-defined seasons. Las Vegas and Montgomery are pretty much hot all the time. Football of course – there's nothing quite like the sea of orange on Saturdays.

Webserver Move

All websites and web services hosted by ICL were recently moved to a new machine. If you notice any problems with any of the websites or any other issues, send e-mail to **icl-webmaster@eecs.utk.edu**.

RELEASES

PLASMA 2.2.0

The PLASMA project had two new releases last month. Version 2.2.0 of the libraries is now available along with v1.2.0 of the installer, a Python script that downloads and builds the libraries. For more information, see the **PLASMA News** page.

PEOPLE

DEPARTURES

Rajib Nath successfully completed his MS Thesis and will graduate in August. He will be continuing his studies at UC, San Diego in California. Congratulations Rajib!

ARRIVALS

Mitch Horton, a recent PhD recipient from EECS, has accepted a Post-Doc position with us and will be working with the Linear Algebra group.

Two new GRAs will begin working with us this month: **Blake Haugen** and **Tingxing (Tim) Dong**. In addition, grad student **Frank Lauer** will be working with the group while he studies to pass the TOEFL exam and hopefully enter UT's grad school spring semester 2011.

Jakub and his wife Adelajda welcomed their second son, Christopher Henry Kurzak, on July 11th. Congratulations Jakub!

REMINDERS

Be sure and lock your office doors when you step out. Don't make your office contents available to people who have nothing better to do than take things that don't belong to them.

AUG 10 Full and second summer sessions end
AUG 12-13 Retreat
AUG 18 Fall classes start
SEPT 4 UT Football (vs. UT Martin) 6:00 pm
SEPT 6 Labor Day (UT closed)

RECENT CONFERENCES CONTINUED

JUL 15 Knoxville, TN
SAAHPC'10 / MAGMA Tutorial by Stan, George, and Cédric Augonnet titled "Accelerating Linear Algebra on Heterogeneous Architectures of Multicore and GPUs using MAGMA and the DPLASMA and StarPU Schedulers" **PDF**

UPCOMING CONFERENCES

AUG 2 - 5 Snowbird, UT
CScADS: Performance Tools for Petascale Computing / Dan

AUG 9 - 11 Snowbird, UT
CScADS: Libraries and Autotuning for Petascale Applications / Jack, Shirley, Jakub, and Anthony

AUG 31 Ischia - Naples, Italy
Euro-Par 2010 / Jack

RECENT LUNCH TALKS

JUL 2 Piotr **CUDA Versus OpenCL: Profiling and Performance Analysis Perspective** **PDF**

JUL 9 Dulceneia Becker (visitor from Brazil) **An Object-Oriented Parallel Finite-Volume CFD Code** **PDF**

JUL 16 Anthony **On Probing the Architecture and Interpreting the Results** **PDF**

JUL 23 Vince **Can We Understand Performance Counter Results?** **PDF**

JUL 30 Cedric Augonnet (visitor from INRIA Bordeaux - LaBRI, France) **The StarPU Runtime System or How to Get Portable Performance on Accelerator-based Platforms Without the Agonizing Pain** **PDF**

UPCOMING LUNCH TALKS

AUG 6 Mike Berry (UT EECS)

AUG 13 No Lunch Talk (ICL Retreat)

AUG 20 TBA

AUG 27 TBA