C4G Projects Highlight Review Day

Jason Carter (left), founder of Democrats Work (and newly announced candidate for the Georgia State Senate), speaks at the Dec. 1 C4G Review Day. Held in the Klaus Building, the event highlighted projects from the Fall 2009 Computing 4 Good class and also featured a panel of distinguished speakers. Joining Carter were Protip Biswas, executive director of the Regional Commission on Homelessness, along with (not pictured) John Nkengasong, chief of the CDC Global AIDS Program’s International Laboratory Branch, and Jack Hardin, founding partner of Rogers & Hardin and former chair of the United Way of Metropolitan Atlanta.

Research News

YTD New Awards $5,484,179

| Proposed Contracts for October 2009 |
|-------------------------------|--------------------------------|
| Total | $ Amount | IC | CS | CSE |
| 9    | $3,964,006 | 24% | 59% | 17% |

Newly Awarded Contracts for October 2009

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Value</th>
<th>PI</th>
<th>Co-PIs</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSF</td>
<td>$12,000,000</td>
<td>Jeffrey Vetter</td>
<td>Karsten Schwan, Richard</td>
<td>Keeneland: National Institute for Experimental</td>
</tr>
</tbody>
</table>

Numbers & Stats

6 CoC employees now devoted full time to supporting graduate programs

230 Attendees at 7th Georgia Tech International Conference in Bioinformatics, held on campus Nov. 12-14

250 Approximate number of media articles/postings nationally about GT’s involvement at SC09

12 Projects highlighted in C4G Review Day, Dec. 1

This month various groups at CoC are pursuing partnerships with the following companies:
<table>
<thead>
<tr>
<th>Donor</th>
<th>Amount</th>
<th>PI</th>
<th>Co-PIs</th>
<th>Description of Gift/ Donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft</td>
<td>$10,000</td>
<td>Wenke Lee</td>
<td>None</td>
<td>General Research</td>
</tr>
<tr>
<td>Google</td>
<td>$50,000</td>
<td>Russell Clark</td>
<td>None</td>
<td>Efficient Data Structures</td>
</tr>
<tr>
<td>Intercontinental Exchange</td>
<td>$25,000</td>
<td>Calton Pu</td>
<td>None</td>
<td>Advanced Computing Research</td>
</tr>
<tr>
<td>Cisco Systems</td>
<td>$75,000</td>
<td>Constantine Dovrolis</td>
<td>None</td>
<td>Internet Econ Models &amp; Policy Impact</td>
</tr>
<tr>
<td>Yahoo</td>
<td>$5,000</td>
<td>Alexander Gray</td>
<td>None</td>
<td>Machine Learning and Data Mining Seminar</td>
</tr>
</tbody>
</table>

## Grants/ Gifts Received for October 2009

- **Fujimoto Computing**
  - **Semiconductor Research Corp**: $30,000 - Milos Prvulovic - None - Performance Debugging Support for Many-Core Processing
  - **BBN Systems and Technologies**: $37,000 - Nick Feamster - None - Military Networking Protocol
  - **NSF**: $99,306 - Nick Feamster - None - CT-T: Collaborative Research: Towards an Accountable Internet Architecture
  - **NSF**: $50,000 - Beki Grinter - Michael Best; Aaron Bobick; Keith Edwards; Elizabeth Mynatt - Creating a Research Agenda in Computing at the Margins
  - **NSF**: $250,000 - Tucker Balch - Jay Summet; Mark Guzdial; Daniel Walker - Personal Robots for CS1: Next Steps for an Engaging Pedagogical Framework
  - **Intel**: $50,000 - Rich Vuduc - None - Autotuning Applications for Emerging Multicore Platforms
  - **NSF**: $200,000 - Beki Grinter - Keith Edwards - Collaborative Research: Towards Human-Network Interaction

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**People@CoC**

Gray, Lebanon Co-Orgaizing Workshop at Machine Learning Conference

Assistant Professors Alex Gray and Guy Lebanon (both CSE) are coorganizing workshops at the 2009 Neural Information Processing Systems (NIPS) Conference, one of the world’s premier machine-learning conferences, to be held Dec. 7-10 in Vancouver, Canada. Gray’s workshop, titled “Large-Scale Machine Learning: Parallelism and Massive Datasets,” will focus on how large-scale machine-learning algorithms should be informed by future parallel architectures. Fellow Assistant Professor Rich Vuduc will attend the workshop and present a paper, “Tuning GPUs for Fast Multipole Methods.” Lebanon is co-chairing two workshops, “Learning With Orderings,” which will examine directly building statistical models and learning algorithms on discrete combinatorial spaces; and “Statistical Machine Learning for Visual Analytics,” which will study whether the advent of machine learning in visual analytics requires new theory and methodologies that bridge visualization, interaction and statistical learning. All
workshops will be held Dec. 11-12 in Whistler, Canada, following the conclusion of the NIPS conference.

**Supercomputing SIAG Elects Bader, Vuduc as Officers for 2010-11**

Professor David Bader and Assistant Professor Rich Vuduc (both CSE) have been elected officers by the SIAM Activity Group on Supercomputing (SIAG/SC). Bader was elected program director and Vuduc elected secretary by the group’s 126 members. Both will serve two-year terms, starting Jan. 1, 2010. The SIAG/SC runs the *SIAM Conference on Parallel Processing and Scientific Computing*, scheduled for Feb. 24-26, 2010, in Seattle.

**Vempala Wins Simons Foundation Fellowship**

Distinguished Professor Santosh Vempala (CS) has been awarded a two-year grant from the Simons Foundation to hire a postdoctoral fellow. The foundation will fund 31 postdoctoral fellowships to begin during Fall 2010 in mathematics, theoretical physics and theoretical computer science. According to Simons, the academic programs receiving the fellowships were selected “by a committee of distinguished scientists in [CS theory] as providing a particularly suitable environment for nurturing the talent of our best young researchers.”

**Mynatt at Discovery and Innovation in Health IT Workshop**

Professor Beth Mynatt (IC) helped organize the Discovery and Innovation in Health IT workshop, held in San Francisco, Oct 29-30. This invitation-only workshop—organized by the National Science Foundation, the Office of the National Coordinator for Health Information Technology, the National Institute of Standards and Technology (NIST), the National Library of Medicine, the Agency for Healthcare Research and Quality, the Computing Community Consortium, and the American Medical Informatics Association—pulled together researchers from academia, government and corporate labs to lay out the key health IT research challenges. The goals were to explore and define fundamental research challenges and opportunities in health care IT in both the near and long terms; provide opportunities for relevant academic and industrial researchers, health care practitioners and IT health care suppliers to identify mutual interests in health care IT; and identify a range of “model” proof-of-concept, integrative systems that might serve as motivating and unifying forces to drive fundamental research in health care IT and accelerate the transition of research outcomes into products and services. Mynatt will participate in a Dec. 15 briefing in Washington on the workshop’s outcomes for various agencies, including NIH, NSF and NIST.

**Balcan Wins CMU Dissertation of the Year Award**

Assistant Professor Nina Balcan’s (CS) doctoral thesis at Carnegie Mellon University, titled “New Theoretical Frameworks for Machine Learning,” was named CMU’s Dissertation of the Year. Balcan earned her Ph.D. from CMU in 2008 under advisor Avrim Blum. From the thesis: “We develop theoretical foundations and new algorithms for several important emerging learning paradigms of significant practical importance, including Semi Supervised Learning, Active Learning, Learning with Kernels and more general similarity functions.” In addition to machine learning, Balcan’s research interests include economics, game theory and algorithms.

**Vuduc Autotuning Work Contributes to R&D 100 Award**

A multi-institutional team that includes Assistant Professor Rich Vuduc (CSE) picked up an R&D 100 Award at the contest’s Nov. 12 ceremony, held in Orlando, Fla. Sponsored by R&D magazine, the annual awards are given to products which the magazine judges “the most technologically significant” of the year. Vuduc’s team, led by researchers at Lawrence Livermore National Laboratory, created the ROSE Compiler, a freely distributed open-source infrastructure for developing program analysis and source-to-source program transformation tools. Vuduc and his lab contributed to the portion of the project aimed at autotuning general programs for faster and/or parallel processors. Other universities involved in the ROSE project include the University of Texas at San Antonio, Vienna University of Technology and Indiana University.

**ARC Awards 5 Graduate Fellowships for Spring 2010**

The Algorithms & Randomness Center (ARC) and ThinkTank has announced its fellowship winners for Spring 2010. The winners, including their ARC mentors and proposed projects, include:

- **Da Kuang**, CSE (Mentor: Haesun Park): “Matrix Factorization for Clustering: NMF and Beyond”
- Ricardo Restrepo, Math (P. Tetali): “Convergence of Local Interactions in Catalan
Structures

• Xuefeng Gao, ISYE (T. Dieker): “Capacity Allocation in Queueing Networks”

Each fellowship covers half the cost of a GRA for the spring term. The fellowship winners were chosen by a committee comprising ARC faculty members Prasad Tetali (chair, CS), Bill Cook, Eric Vigoda (CS), Vladimir Koltchinskii, Milena Mihail (CS) and Ton Dieker. More information is available on the ARC website.

**Brubaker Wins CoC Ph.D. Dissertation Award**

Charlie Brubaker, an August 2009 Ph.D. graduate in Computer Science, has won the College of Computing Doctoral Dissertation Award for his thesis, “Extensions of Principal Component Analysis,” and the College has voted to recommend the work for the ACM Doctoral Dissertation Award, which each year recognizes the best CS dissertation in the country.

Brubaker was advised by Distinguished Professor Santosh Vempala (CS), and his thesis committee includes professors Haesun Park (CSE), Vladimir Koltchinskii (Math), Adam Kalai, senior researcher at Microsoft Research New England, and Ravi Kannan, principal researcher for Microsoft Research India. Principal Component Analysis (PCA) is one of the most widely used data-analysis techniques in science and engineering. PCA is notorious for its vulnerability to noise and for its lack of scale-invariance. The thesis addresses these outstanding issues and demonstrates how to make PCA more practical and reliable.

“Besides the sheer technical strength of his results, Charlie has put in a great deal of effort into clear exposition,” Vempala wrote. “His thesis is consistently insightful and a pleasure to read. It is hard for me to recall a more impressive thesis in algorithms in recent years.”

**Mynatt Gets Kavli Symposium Invite**

Professor Beth Mynatt (IC) was invited to the National Academy of Science's 21st Kavli Frontiers of Science Symposium at the Beckman Center, Calif., Nov. 12-14. The symposium brings together the very best scientists under 45 years of age to discuss exciting advances and opportunities in their fields. Participants include leading researchers from academic, industrial and federal laboratories in such disciplines as astronomy, astrophysics, atmospheric science, biology, biomedicine, chemistry, computer science, earth sciences, genetics, material sciences, mathematical sciences, neurosciences, pharmacology and physics.

**CoC Team Makes Finals in Google Android Developers Challenge**

A team of two College master's students and one undergraduate has made the finals of Google's second Android Developers Challenge. M.S. students Sven Blaese and Dhawal Shah (both CS), along with second-year Computational Media major Joy Buolamwini, are the minds behind MoVue, an Android application that integrates compass/orientation sensors, GPS and the on-board camera to enhance the user's vision by transforming an android phone into an augmented reality device. One of 20 finalists in the Travel category, MoVue is in the running for the ADC's $100,000 first prize for best in category, as well as the additional $150,000 prize for best overall application. Judging for ADC 2 was scheduled to be completed in November, with winners announced shortly thereafter.

**GT Hosts Biennial International Bioinformatics Conference**

For the seventh time since 1998, Georgia Tech hosted the International Conference in Bioinformatics, in partnership with Oak Ridge National Laboratory, Nov. 12-14. The Center for Bioinformatics and Computational Genomics organized the conference, which featured two National Academy of Sciences members (Jeff Bennetzen and David Lipman). Most of the conference took place in the Ferst Center for the Arts.

Regents' Professor Mark Borodovsky (CSE) served as co-program chair for the event. He said Georgia Tech, known globally as a hub in bioinformatics research and training, hosts the conference every other November. Georgia Tech launched the first M.S. program in bioinformatics in 1998, followed five years later by a Ph.D. program, and Borodovsky said gene-finding algorithms developed at Georgia Tech were of primary use in five out of the top 10 genome projects of all time, including the first completely sequenced genomes of bacteria and archaea at the J. Craig Venter Institute (former TIGR). More than 230 researchers attended the event, and for the first time, one plenary session was delivered remotely—from Imperial College, London.

**GT Makes Another Strong Showing at SC 2009**

Once again, not only the College of Computing but Georgia Tech as a whole was well represented at SC2009, the international conference on high-performance computing, networking, storage and analysis, held Nov. 14-20 in Portland, Ore. Highlights included a Best Paper nomination for work in computational biology, as well as expert presentations across a range of hardware, software and application domains. This year Georgia Tech featured its efforts in multidisciplinary, cross-industry research efforts focusing on computational scientific
discovery and sustainable high-performance computing. Faculty, researchers and graduate students from the College of Computing contributed to the conference through the following efforts:


• TECHNICAL PAPER: “Age Based Scheduling for Asymmetric Multiprocessors,” coauthored by Nagesh B. Lakshminarayana, Jaekyu Lee and Hyesoon Kim (all CS).

• PANEL: “Preparing the World for Ubiquitous Parallelism,” moderated by Matthew Wolf (CS).


• SC09 EDUCATION PROGRAM: “Think Parallel” broadcast, featuring Matthew Wolf.

CoC faculty also played leadership roles in SC09 planning. Those duties included:

• George Biros and Rich Vuduc were members of the Technical Papers Applications Area Committee.

• Ada Gavrilovska was a member of the Technical Papers Architecture/Network Area Committee.

• Jeffrey Vetter (CSE) was a member of the Technical Papers Storage Area Committee.

• David Bader was a member of the Posters Algorithms Committee.

Five Georgia Tech professors gave media interviews with top-tier outlets, and all told the Institute’s efforts resulted in 16 original stories published in media around the country (a fourfold increase from 2008), along with about 250 wire story and/or press release reprints.

Personnel Announcements

Jessica Celestine has joined CoC as an Academic Advisor I in IC effective Nov. 16. Her email address is jcelesti@cc, phone number is 5-7205 and she is located in TSRB 224. Welcome Jessica!

Kristen Doorn has joined CoC as a Tech Temp in International Programs effective Nov. 3. Her email address is kdoorn@cc, phone number is 4-9646 and she is located in CCB 138. Welcome Kristen!

General News

CoC Staff Earn Certificates Through OOD Training Classes

At a graduation ceremony held Nov. 16, several College staff members received certificates marking their successful completion of professional training programs offered by the Georgia Tech Office of Organizational Development. Those individuals and the programs they completed include:

• Office Professional Certificate: Alfreda Barrow (CS)
• Management & Supervisory Development Certificate: Julie Williams (CoC)
• GT Financial Fundamentals Certificate: Erica Edwards (CS), Connie Irish (IC), Preethi Reddy-Veluri (CoC)
• GT Financial Specialist Certificate: Preethi Reddy-Veluri (CoC)
• Emerging Leaders Certificate: Preethi Reddy-Veluri (CoC)

OOD Director Lanous Wright and Georgia Tech Executive Vice President Steve Swant both spoke at the ceremony to congratulate the year’s graduates.

Communications Office Picks Up the Hardware in 2009

The College’s Office of Communications netted several awards for its activities in November. First were two Gold Tower Awards, presented during Georgia Tech’s first-ever ceremony to recognize communications excellence on campus. In a ceremony held Nov. 12, President Bud Peterson presented Director Stefany Wilson with two Gold Towers: one for the “6 Reasons to Go” campaign, launched in late 2008 to increase participation in the College’s international study programs; and one for The Compiler, the College’s monthly electronic newsletter. Wilson also shared in a third Gold Tower, this one awarded to Georgia Tech Research News for its
press release announcing the College's FODAVA grant in Fall 2008. One day after the Gold Towers were awarded, the communications office learned it had won a 2009 MarCom Gold Award for Strategic Planning and Evaluation, given for its 2008-09 strategic communications plan, from the Association of Marketing & Communications Professionals.

College Reorganizes Graduate Programs Administration

To better support 800 master's and Ph.D. students spread across 12 degree programs, interim Dean Jim Foley announced in November a restructuring of two programs, as well as the professional staff who manage them. Given the integral role all College schools and divisions play in these degrees, the M.S. degree in computer science will be housed in the College itself and the Ph.D. degree will be joint across the schools; master's students' academic “home” will also be the College, while Ph.D. students' homes will be determined by the primary appointments of their advisors. All other graduate degrees will continue to be based in the school/division where they have appropriate intellectual foundations, and curricula will continue to be determined by faculty committees assigned to each degree.

Regarding personnel, David White was appointed director of graduate programs for the College. In the College, he will manage Lisa Guethlein and Kemonta Gray and coordinate with graduate program staff based in the units: Alan Glass (CS), Sheila Williams (CSE) and Jessica Celestine (IC). White reports to interim Associate Dean for Graduate Affairs Charles Isbell (IC), also associate dean for undergraduate affairs.

GT-Lorraine Accepting Applications for Summer 2010

Attention undergrads: At Georgia Tech-Lorraine, students from all around the world get the opportunity to study in the heart of Europe. Metz is conveniently located so students can spend long weekends exploring and experiencing different cultures. Summer undergraduate students will have more than 30 classes to choose from, and most scholarships apply (including HOPE). Additionally, Georgia Tech's Office of International Education offers scholarships specific to study abroad. Application deadline is Feb. 15, 2010. For more information, contact Catherine Bass at catherine.bass@gtl.gatech.edu

Courses Set for Summer 2010 Program in Barcelona

Students interested in studying next summer in Barcelona can now submit applications to the Office of International Education. Space is limited, so students are encouraged to apply soon. For summer 2010, the program fee has been reduced to $4,999, and out-of-state students can take their summer coursework in Barcelona at in-state tuition rates plus $250. During the summer 2010 program, students will choose four courses from:

- ARCH 4128 – Barcelona: Architecture and Design
- CS 3750 – Human-Computer Interface Design and Evaluation
- CS 4001 – Computing, Society and Professionalism
- CS 4475 – Computational Photography
- CS 4793 – Perspectives in Cognitive Science: The Intersection of Culture and Mind
- SPAN 1813/2813/3813 – Spanish-language courses at three proficiency levels

For more information, contact Dawn Rutherford at barcelona@cc.gatech.edu.

Correction

In the November Compiler, we erroneously reported the title of a grant to Assistant Professor Jonathon Giffin of Computer Science. The award, which totaled $405,000, is named “Local Remediation of Global Internet Epidemics.” The Compiler staff regrets the error.