click!

Siebel Center @ 10

ALSO IN THIS ISSUE:

Department of Computer Science

To me, programming is more than an important practical art. It is also a gigantic undertaking in the foundations of knowledge.

Grace Hopper

CS @ ILLINOIS

Department of Computer Science
College of Engineering, College of Liberal Arts & Sciences
University of Illinois at Urbana-Champaign

click!

MAGAZINE 2014, VOLUME I

> **The past is the heritage we celebrate, but the future is the adventure we embrace.**

CS @ ILLINOIS will celebrate two major milestones this year—the 50th anniversary of Computer Science as a University department, and the 10th anniversary of our home: the Thomas M. Siebel Center for Computer Science. We invite you join us on campus this year to reminisce and rekindle old acquaintances, and to meet our stellar new faculty hires and our über smart current students.

Our faculty continue to earn top academic accolades from the ACM, IEEE, INFORMS, and German National Academy of Sciences Leopoldina, just to name a few. Our students have followed suit, garnering highly competitive national fellowships and participating in opportunities like the NASA Microgravity Program.

I am especially pleased with the great strides we are making in getting both local and state attention—*and action*—on expanding computer science education in our elementary and secondary schools. We are not only training high school teachers to inspire interest in our field, but are also helping to catalyze real change in the State of Illinois curriculum—to count computer science courses as credit towards math and science requirements.

Lastly, I will say that I am often humbled by the philanthropy that our alumni share with us to support our faculty and students. But I am especially grateful to a young entrepreneur, Ram Gudavalli (BS ECE '00), who wanted to start giving back to help others in the spirit that he was helped as a student. His gift is the first for both CS and ECE in the new Engineering Visionary Scholarship campaign. We hope other alumni will follow his lead.

Though it is great fun to remember our history, every day our faculty, students and alumni move the field forward through research and discovery. The past is the heritage we celebrate, but the future is the adventure we embrace.

Rob A. Rutenbar, Head

Richardson Inducted into Engineering at Illinois Hall of Fame

BY TOM MOONE

For most people, when you find yourself sitting in the chair at the dentist, you're probably anticipating bad news. Having something good happen at such a moment would be a rather pleasant surprise.

So you can imagine how Fontaine Richardson (PhD CS '68) felt when he learned—while sitting in just such a dental chair—that he would be inducted into the Engineering at Illinois Hall of Fame.

"I was euphoric," said Richardson. "I don't have an accurate way to say what I felt. It took me by surprise."

He need not have been so surprised. Since leaving the University of Illinois, Richardson has been one of the dominant people in the area of research and development of computer-aided design tools.

When he graduated from the University of Illinois in 1968, Richardson held just the second PhD ever granted by the Department of Computer Science. His dissertation described a flowchart programming language that was used in the ILLIAC II computing system.

It was a time when a PhD in computer science in general was rare and was considered exotic. "I got some job interviews I think in part because people wanted to see what a PhD in computer science would look like," Richardson said.

But his skills were in demand. He landed a job at the Lincoln Laboratories at MIT working with a group that was using a computer to design electronic circuits. He and some colleagues believed that the technology could be developed into a marketable product. In 1969, Richardson and three colleagues founded Applicon, Inc., to commercialize the work that they had been doing at MIT. In 1971 the company released the first commercially available computer-aided design system. This was the first product in what has become a tremendously important manufacturing area.

"There really aren't any products designed today that aren't done with computer tools very similar to what we pioneered," Richardson said.

Richardson left Applicon to become an independent consultant and visiting scientist at MIT. In 1983 he joined Eastech Management Company, a venture capital firm. In 1992, he received the University of Illinois College of Engineering Alumni Award for Distinguished Service.

In his remarks at the Hall of Fame ceremony, Richardson stated, "I want to thank the University of Illinois for teaching me to be curious, to learn, and to grow—skills I have used all my life."

From Left: University of Illinois President Robert Easter, Chancellor Phyllis Wise, Fontaine Richardson, and Dean Andreas Cangellaris.

CS @ ILLINOIS
AWARDS
for ALUMNI & FACULTY

The CS @ ILLINOIS Awards recognize alumni and faculty members who have made professional, technical, educational, and service contributions that bring distinction to themselves, the department, and the university.

Honorees are invited to campus during Homecoming for a day-long celebration of their achievements, where they meet with faculty, present technical talks, and connect with current students to share their stories of success and offer helpful advice from their life and career experiences. Please meet the recipients acknowledged at the October 24, 2013 dinner and ceremony.

DISTINGUISHED ACHIEVEMENT AWARD

Sandra Rankin

Sandra Rankin (BS CS '74) joined IBM soon after receiving her undergraduate degree. She is a retired IBM executive with 33 years' experience in the field of information technology.

Along the way, she made a wide range of contributions, from improvements to IBM's mainframe software and hardware systems (including a US patent for the hardware encryption of customer data), to product improvements for OS/2 (which was IBM's operating system for the personal computer), to work on standards for Internet technologies like Java and XML. Finally, as Vice President, Rankin managed IBM's mainframe software and firmware development teams: over 3000 people worldwide and a budget of $250 million.

Today she is an active volunteer with United Way of Western Connecticut and the founder, board chair, and acting executive director of Technology Solutions for Non-Profits (TS4NP), which delivers low-cost private cloud services to small local nonprofit agencies. Rankin recently established The Sandra and John Rankin Engineering Scholarship, with a preference to support female CS undergraduates from Illinois.

DISTINGUISHED ACHIEVEMENT AWARD

Chris Lattner

Chris Lattner (MS CS '02, PhD '05) joined Apple, Inc., after completing his PhD. He is currently the Director and Architect of the Developer Tools Department, a position he has held since January 2013.

At Apple, Lattner is in charge of driving innovation in the programming tools space, as well as managing Apple's developer tools products for both OS X and iOS.

Most importantly, though, Lattner is the founder and chief architect of the open source LLVM Compiler Infrastructure project. LLVM is an umbrella project that has grown to include a broad range of compiler, debugger, and runtime library technologies. First released as an open source project in October 2003, LLVM is now the primary compiler used in many large and small technology companies. It is found in products such as iOS and Android mobile devices to Cray supercomputers.

LLVM's influence has been recognized with two major awards: the 2010 ACM SIGPLAN Programming Languages Software Award and the 2012 ACM Software System Award.

DISTINGUISHED EDUCATOR AWARD

Diane Cook

In her 22 years as an educator, Diane Cook (MS CS '87, PhD '90), the Huie-Rogers Chair Professor at Washington State University, has taught hundreds of students, mentored the research of 44 master's students and 24 doctoral students, has authored over 300 papers, and is the inventor of a US patent.

Cook's current research applies machine learning and pervasive computing research to the design of smart environments. By collecting data from sensor-filled homes and other environments, machine learning techniques can be used to discover and recognize patterns of human behavior. Strategies can then be learned to assess the well-being of the residents, to extend functional independence for older adults and those with disabilities, and to promote healthy, sustainable behaviors.

Cook is a Fellow of the IEEE and the Future Technology Research Association, and she is a recipient of both an NSF Research Initiation Award and an NSF CAREER Award.

DISTINGUISHED EDUCATOR AWARD

Miloš Ercegovac

Miloš Ercegovac (MS CS '72, PhD '75) is a Distinguished Professor of Computer Science in the Henry Samueli School of Engineering and Applied Science at the University of California at Los Angeles, where he has been on the faculty since 1975. He has held a variety of important roles, including leading UCLA's Department of Computer Science from 2000 to 2005, serving as the long-time vice chair of graduate programs, and serving as the current vice chair of industrial relations.

Ercegovac has specialized for over 40 years in research and teaching in digital arithmetic, digital and computer system design, and parallel architectures, advising dozens of graduate students. He has been extensively published in the leading journals and conferences, with nearly 250 research papers and four textbooks.

His teaching and his research have been recognized with a number of awards, including Foreign Membership in the Serbian Academy of Sciences and Arts, IEEE Fellow—"for contributions to the theory and practice of digital arithmetic," and the 2009 Lockheed-Martin Excellence in Teaching Award.

Shan Lu

Shan Lu (PhD CS '08) is a Clare Booth Luce Assistant Professor in the Computer Science Department at the University of Wisconsin, Madison. She teaches courses in distributed systems, introduction to operating systems, and advanced operating systems, and she has consistently received outstanding evaluations from her students.

She has won a number of awards and large NSF grants for her work, including an NSF CAREER Award in 2010.

Lu is committed to encouraging other women in the field of computer programming. She has been a committee member of Grace Hopper Celebration of Women in Computing panels, workshops, and presentations. She has been a volunteer, working with girls in grades 6-8, for Expanding Your Horizons—Young Women Exploring Math and Science Careers. And she has presented at the Computing Research Association for Women (CRA-W) workshops.

While at Illinois, she had received the W. J. Poppelbaum Memorial Award in 2007 as a top Illinois graduate student in computer hardware or architecture.

Channing Brown

After graduating from Illinois, Channing Brown (BS CS '80) went on to the University of California, Berkeley, where he received a master's degree in 1982. He then moved to New Jersey, where he worked for Telcordia Technologies (formerly known as Bellcore, now a part of Ericsson) as a senior software engineer.

Brown relocated to Champaign in February 2006. Since then he has remained very engaged with the department and the university. He gives of himself in a variety of ways, from regularly acting as a judge for the Engineering Open House, supporting and mentoring students in the Illinois Promise Program, becoming an active booster for women's volleyball, and volunteering at the Intensive English Institute. He has shown himself to be a strong supporter of the Women in Computer Science student organization. In 2010, he established the Channing Brown Scholarship, which supports Computer Science students.

Jed Taylor

Jed Taylor (MS CS '03, MBA '05) is the assistant director of the Technology Entrepreneur Center (TEC) on the Illinois campus and an Entrepreneur in Residence (EIR) at Enterprise Works.

Just prior to joining TEC in 2010, Taylor had spent several years at Pattern Insight, a startup founded by his former Illinois faculty advisor Yuanyuan Zhou. He now uses that experience to help members of the Illinois community become innovative entrepreneurs and launch new ventures. He provides mentoring, shares lessons learned, and connects them with alumni, investors, and other successful entrepreneurs.

Taylor has more than doubled the sponsorship dollars for the Cozad New Venture Competition, where students develop business proposals and compete for startup funding, and he has increased alumni involvement, providing even more value to our students.

In addition, he strives to help build a strong local tech community by serving on advisory boards of several startups in the Champaign-Urbana area.

DISTINGUISHED SERVICE AWARD

William Kubitz

William Kubitz (BS Physics '61, MS Physics '62, PhD EE '68) first came to the University of Illinois as an undergraduate in 1957. As a graduate student he worked in the research group of W. J. Poppelbaum, which was involved in digital and analog systems for the ILLIAC III computing system.

After receiving his doctorate, Kubitz stayed at the university, first as a postdoctoral assistant and then as a faculty member. His research focused on graphics, VLSI, and circuits.

In 1985 he became the first associate head of the department. Until his retirement in 2000, he was a leader for several key initiatives. He helped to spearhead the effort to network the campus and to continue to improve our computing infrastructure. He also helped establish the first personal computing labs.

Kubitz was instrumental in two major construction efforts: the expansion of DCL (completed in 1989), and the planning and construction of the Thomas M. Siebel Center for Computer Science, completed in 2004.

Dennis Mickunas

Dennis Mickunas joined the faculty of the University of Illinois in 1973. During his time in the department, he conducted research on programming languages, compilers, dynamic security policy architectures, and component-based operating systems.

Mickunas taught a variety of computer science courses, engaged in outreach to prospective students and parents, and provided academic counseling to engineering students. He was co-author of An Introduction to Computer Science Using Java (2nd ed., 2001), as well as two book chapters, 38 refereed papers, and 37 technical reports.

Mickunas served as associate department head from 2000 to 2004. He was instrumental in the successful commissioning and opening of the Siebel Center, ensuring that space was allocated properly and creating policies for use of the new building.

Upon his retirement in 2004, Mickunas attended law school at the University of Illinois and graduated cum laude in December 2006. Today he is licensed in both Florida and Illinois.

Mehdi Harandi

Mehdi Harandi joined the department in 1979. He established and directed the Knowledge-Based Programming Assistant project, a large-scale research project for studying and developing knowledge-based software development tools. He also co-directed the Advanced Collaborative Systems Laboratory and was the co-principal investigator and one of the founders of the Illinois Software Engineering Program (ISEP). He has done extensive research in distributed information systems, expert systems, knowledge representation and acquisition, software reuse, specification and design, reverse engineering, and intelligent programming tools.

Harandi served as the director of the graduate program from 1999 to 2005. In this position, he was a key to the establishment of the department's online professional master's program. He then became the associate head of the department, a position he held until his retirement in 2011.

Steven LaValle

Steven LaValle (BS EE '90, MS EE '93, PhD '95) joined the department in 2001 from Iowa State University.

From 2004 to 2007, Lavalle served as the coordinator of graduation admissions and advancement, in which capacity he directed the department's graduate program, supervised admissions policies, and coordinated recruitment efforts. He undertook a reform of the PhD program that moved it from a relatively rigid set of PhD requirements to a system that is more flexible and that provides a better roadmap and timeline for faculty and students.

Lavalle is author of two books: Planning Algorithms (2006) and Sensing and Filtering: A Fresh Perspective Based on Preimages and Information Spaces (2012). In 2003 he received the C. W. Gear Outstanding Junior Faculty Award from the department. In 2009 he received the Award for Excellence in Physical Sciences and Mathematics from the Association of American Publishers, and in 2012 he was named a University Scholar.

DISTINGUISHED SERVICE AWARD

H. George Friedman

H. George Friedman joined the department in 1965, and teaching and mentoring soon became his passions. He became involved in the development of the PLATO and NovaNet computer-aided instruction systems and courseware. These were both new ways to convey knowledge and new ways to interact with students.

Friedman served as the director of undergraduate programs from 1985 through 1998, where he supervised hundreds of students. In this role, he helped lead the department through challenging times and constant changes to the curriculum, reflected by the growth of personal computers, the growth of the Internet, and a large growth in student populations.

Friedman was key in the development of the university's first online course registration system, and CS was one of the new system's pilot departments.

Outside the department Friedman was a member of the Urbana-Champaign Senate from 1977 through 2000. He retired in 1998. He continues to serve on the Senate Committee on University Statutes and Senate Procedures, and as Senate Parliamentarian.

Sam Kamin

Sam Kamin joined the department in 1980. Kamin's main area of research was programming languages; he has also published in the areas of formal methods, high-performance computing, and educational technology. He is the author of Programming Languages: An Interpreter-Based Approach, a textbook on programming languages, and is co-author of introductory books on Mathematica, C ++, and Java.

In 1999, he succeeded H. George Friedman as director of undergraduate studies. He served as director until 2007 and led a reevaluation of the computer science curriculum. During his tenure in that position, Kamin was known for his talks with prospective students, for organizing freshmen scavenger hunts, and pushing for more student social events.

He also strongly encouraged the Women in Computer Science student organization. He secured NSF funding for recruiting and retaining women, including visits to high schools around the state through the ChicTech outreach program.

C. W. GEAR OUTSTANDING JUNIOR FACULTY AWARD

Svetlana Lazebnik

Svetlana Lazebnik (MS CS '02, PhD '06) joined the department in 2012 after several years as a faculty member at the University of North Carolina at Chapel Hill. There she received the UNC Junior Faculty Development Award and the UNC Computer Science Student Association Teaching Award.

At Illinois, her research interests include object recognition and scene interpretation; modeling and organizing large-scale photo collections; and machine learning techniques for visual recognition problems. Methods she developed are now widely used by researchers in computer vision. In 2013, she received the Dean's Award for Excellence in Research from the College of Engineering and a Sloan Research Fellowship.

She also has received an NSF CAREER Award, a Microsoft Research Faculty Fellowship, and became a member of the Defense Advanced Research Projects Computer Science Study Group.

DAVID J. KUCK OUTSTANDING THESIS AWARDS

Joshua Hailpern

Joshua Hailpern (MS CS '08, PhD '12) has focused on exploring the relationship between the design of computer interfaces and those individuals impaired by Autism Spectrum Disorder and aphasia. His work has opened up new research directions in human-computer interaction. He created the first coding guideline for visualization assisted speech metrics, and his video annotation tools have been downloaded over 17,000 times.

He was the recipient of a 2009 Autism Speaks Dennis Weatherstone Fellowship and a Dissertation Completion Fellowship in 2011.

Shin Hwei Tan

Shin Hwei Tan (BS CS '10, MS CS '12) made outstanding contributions to software testing through her master's thesis. Her thesis combines code comments and tests in a novel way that both improves automated testing and finds inconsistencies between comments and code.

Tan's work has been recognized by the Singapore International Graduate Award (2012-2015), the Malaysian Government Scholarship (2006-2010), the Rockwell Collins Scholarship (2009), and the Motorola Academic Scholarship (2008).

★ 50 YEARS ★
50 INNOVATORS

CS @ ILLINOIS is celebrating its 50th anniversary throughout 2014. During the last five decades, our department has produced **thousands of creative and driven graduates** who have made important contributions to the computing field and society at large.

Collectively, our alumni have birthed entirely new industries, generated **billions** of dollars in commerce, created **tens of thousands** of jobs, and revolutionized the way people communicate, shop, conduct business, and are entertained.

To mark this milestone, we've decided to introduce some of these remarkable people—**50 innovators from the last 50 years**. We're featuring 25 in this issue of *click! Magazine* and 25 in the fall issue. We're certainly proud of all our alumni, and we hope you enjoy learning more about some of the entrepreneurs, educators, and technical visionaries who have helped change the world.

SOHAIB Abbasi

Degrees: **BS CS '78, MS CS '80**   Affiliations: **Oracle, Informatica**

Technology pioneer and business leader; Early employee and innovator at Oracle Corporation; Chairman and Chief Executive Officer of Informatica Corporation, an enterprise software category leader.

DANIEL E. Atkins III

Degrees: **MS EE '67, PhD CS '70**   Affiliations: **University of Michigan, National Science Foundation**

Innovative leader in higher education, who founded the University of Michigan School of Information and who created the JSTOR digital library, used by millions for research, teaching and learning. Creative researcher who developed high-speed arithmetic algorithms widely used in processor chips.

SCOTT Banister

Degree: **Attended through 1994**   Affiliations: **IronPort Systems, Submit It!, Zivity**

Entrepreneur and angel investor. Founder of three companies: IronPort Systems, a provider of enterprise email routing and anti-spam solutions purchased by Cisco Systems; web advertising firm Submit It!, which he sold to Microsoft; and Zivity, an ad-free, adult social networking site.

ERIC J. Bina

Degrees: **BS CS '86, MS CS '88**   Affiliation: **Netscape**

Co-author of Mosaic, the first widely used web browser that transformed the exchange of information. One of the initial employees of Netscape Communications Corporation, which produced the Netscape Navigator web browser.

DAVID Blaauw

Degrees: **MS CS '89, PhD '92**   Affiliations: **University of Michigan, Motorola**

An expert on adaptive and low power processor design, he helped introduce the concepts of "energy optimal voltage" and "near threshold design." Co-founder of Ambiq Micro, a developer of energy-effecient microcontrollers.

LUIS Ceze

Degree: PhD CS '07   **Affiliation:** University of Washington

Successful educator, researcher, and entrepreneur whose work has enhanced the performance of multicore processors in notebook and tablet computers, while improving programmability, reliability and energy efficiency. Founder of two successful companies that advance parallelism.

STEVE S. Chen

Degree: PhD '75
Affiliations: Cray Research Inc., SuperComputer International, Galactic Computing Shenzhen Ltd.

Leading developer and designer of Cray Research's early supercomputers—the renowned Cray X-MP and Y-MP. Entrepreneur who founded SuperComputer International, which he sold to Sequent. Brought his expertise to China's Galactic Computing where he invented the Supercomputing Blade System and a cloud computing medical application platform for China's rural, poor areas.

STEVE Chen

Degree: Attended through 1999   **Affiliations:** YouTube, PayPal, AVOS Systems

Technology innovator and entrepreneur who co-founded YouTube, the popular video sharing web site. Co-founder of AVOS Systems, which builds a common technology platform to speed app development and whose products help people create, find, and share multimedia content.

RICHARD T. Cheng

Degrees: MS EE '69, PhD CS '71   **Affiliations:** Old Dominion University, Rochester Institute of Technology, ECI Systems and Engineering, Committee of 100

Gifted and influential educator who taught at several universities, where he led the founding of their computer science departments. Successful entrepreneur who built his company ECI Systems and Engineering into a leading information technology and integrated systems company.

# GREG Chesson

Degrees: MS CS '75, PhD '77   **Affiliations:** Bell Labs, SGI, Atheros Communications, Google

An accomplished musician, known to some as the godfather of networking who contributed to Silicon Graphics Inc.'s (SGI's) technology by inventing the Xpress Transfer Protocol (XTP) and the gigabyte system network (GSN), which set new standards for high-performance networking in 1998.
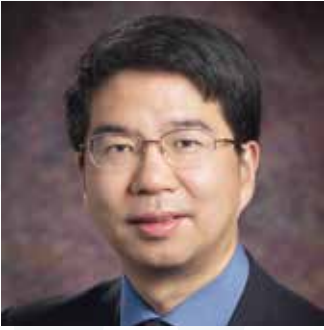
JASON **Cong**

Degrees: **MS CS '87, PhD '90**   Affiliations: **University of California, Los Angeles, Peking University, Aplus Design Technologies Inc., AutoESL Design Technologies**

Academic and entrepreneurial leader in electric design automation and for pioneering work on FPGA technology mapping and high-level synthesis. He has founded/co-founded three companies and trained over thirty doctoral students.

ROGER **Dickey**

Degree: **BS CS '05**
Affiliations: **Liquid Labs, Rocket Street Ventures, Zynga, Curiosoft, National Instruments**

Prolific software designer and entrepreneur, who launched a social gaming startup of Facebook apps and games, including the widely popular Dope Wars. Developed Mafia Wars and Fishville for Zynga, while helping the company grow its markets in Asia. Founder of two other companies, plus angel investor and advisor.

BRENDAN **Eich**

Degree: **MS CS '86**   Affiliations: **Mozilla Foundation, Netscape, Silicon Graphics**

Major contributor to the Internet revolution, including the invention of the widely used JavaScript programming language. He launched Mozilla's Firefox web browser and Thunderbird e-mail client and guides the company's overall technical work.

JERRY **Fiddler**

Degrees: **BA LAS '74, MS CS '77**
Affiliations: **Wind River, Zygote Ventures, Solazyme, University of California, Berkeley**

Entrepreneur, technologist, and corporate investor and advisor. Founded Wind River, a leading provider of embedded software found in digital cameras, routers, and the Mars Rover. Helped create new companies through Zygote Ventures. Chairman of Solazyme, which converts algae into renewable oils.

PING **Fu**

Degree: **MS CS '90**   Affiliations: **Geomagic/3D Systems, University of Illinois NCSA, Alcatel-Lucent**

Inventor, entrepreneur, and author. A pioneer in 3D data capture, she co-founded Geomagic (acquired by 3D Systems), whose innovative software is fundamentally changing how products are designed and manufactured. Wrote a New York Times best seller memoir, *Bend Not Break: A Life in Two Worlds.*

C. WILLIAM Gear

Degrees: **MS Math '57, PhD Math '60**   Affiliations: **University of Illinois, NEC Research Institute**

A pioneer in numerical analysis and scientific computing, as well as a leader in computer science education and industrial research. He created a groundbreaking method for solving stiff ordinary differential equations on digital computers and wrote a landmark computer program for the automatic integration of ordinary differential equations.
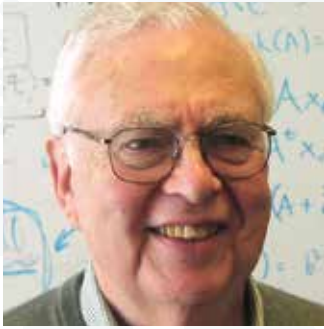
GENE Golub

Degrees: **BS Math '53, MA Stats '54, PhD Math '59, Hon. DSc '91**
Affiliations: **Stanford University, Lawrence Radiation Laboratory, Space Technology Laboratories**

Gifted researcher, educator, and mentor in numerical analysis and applied mathematics' fields. He created algorithms and software that allowed researchers to run large scientific calculations effectively ona computers. He helped develop an algorithm to compute the Singular Value Decomposition, which is an essential computational tool.

JEFF Holden

Degrees: **BS CS '91, MS '92**   Affiliations: **Uber, Groupon, Pelago, Amazon**

Entrepreneur, technology leader, and innovator. Co-founded Pelago, which created the popular location-based social discovery app, Whrrl. He sold Pelago to daily deals innovator Groupon, where he led the charge to create a worldwide local commerce platform. As SVP at Amazon, he led the worldwide consumer experience, including the creation and launch of Amazon Prime.

ROBERT Horst

Degrees: **MS EE '78, PhD CS '91**
Affiliations: **AlterG Inc./Tibion Corp., HT Consulting, Tandem/Compaq Computers**

Inventor of the Tibion Bionic Leg, the first wearable robotic device to help stroke victims and others regain mobility during rehab or physical therapy. The device strengthens a patient's stance, improves gait, and enhances motor learning. Early in his career, he designed fault-tolerant mainframes for banking, stock exchanges, and commerce.

MARY JANE Irwin

Degrees: **MS CS '75, PhD '77**   Affiliation: **Penn State University**

Distinguished researcher and educator who designed the first architecture for discrete wavelet transform, a process that decomposes a signal into a set of basic functions.
This advance provides optimal performance for signal processing and image compression used in computer-aided design. Strong advocate of women in computing.
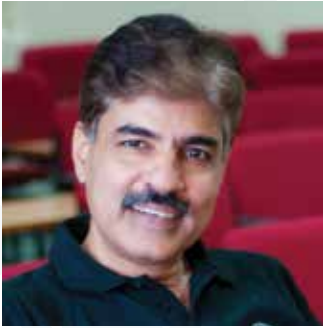
PANKAJ Jalote

Degree: **PhD CS '85**
Affiliations: **Indraprastha Institute of Information Technology Delhi (IIIT-Delhi), IIT Delhi, IIT Kanpur, Infosys, Microsoft**

An academic researcher who has made important contributions to fault tolerant systems and reliability and software engineering, and has written five textbooks on software engineering, project management, and fault tolerance. An able academic leader and administrator who, as founding Director, is credited for developing IIIT-Delhi as a strong research-focused institution.

JAWED Karim

Degrees: **BS CS '04**   Affiliations: **YouTube Inc., PayPal Inc., Y Ventures**

An entrepreneur and tech startup mentor who co-founded the popular video sharing website YouTube. Helped to develop the real-time anti-fraud systems for PayPal. Founded Y Ventures, which helps entrepreneurs to move their innovative products forward.

MARCIN Kleczynski

Degree: **BS CS '12**   Affiliation: **Malwarebytes**

Entrepreneur who founded Malwarebytes, a Silicon Valley security start-up that protects computers worldwide from malicious threats. Malwarebytes quickly grew to be the number one user-installed security software used by over 200 million people worldwide.

CHRIS Lattner

Degrees: **MS CS '02, PhD '05**   Affiliation: **Apple Inc.**

Technology innovator who developed the low-level virtual machine (LLVM) compiler infrastructure, which dozens of companies now use to build and execute software applications on PCs, smartphones, tablets, and other hardware.

ANDY Laursen

Degree: **MS CS '81**   Affiliations: **Oracle, Phone.com, FreeMonee**

While an employee at Oracle, wrote Oracle Real Application Clusters (RAC) and led teams responsible for the Network Computers and massively scalable video servers. Since then he has been on the senior management team of a number of tech startups. He is currently vice president development at FreeMonee, a digital media marketing company.

SIEBEL CENTER
AT **TEN** *years*

By Laura Schmitt

In 1998, CS alumnus Tom Siebel (BA History '75, MBA '83, MS CS '85) returned to campus to talk with students about entrepreneurism.

At the time, the company he had co-founded, Siebel Systems, dominated the customer relationship management software field. After walking around the Digital Computer Lab (DCL) building, Siebel met with then CS Department Head Dan Reed in his office. "He sat down and said, 'Boy, this place looks like a prison,'" Reed recalled. "I laughingly replied, 'It's true Tom, and you could probably do something about that.'" Less than two years later, Siebel donated $32 million to build a more suitable home for one of the world's best computer science departments.

"The challenge I put before this team was to design and build the finest CS research and education facility in the world. I believe they have accomplished that goal."

—Tom Siebel, AT THE BUILDING DEDICATION, 2004

The Thomas M. Siebel Center for Computer Science opened in 2004 and fundamentally changed the culture and trajectory of the department. "The building has had a profound effect on the atmosphere in the department," said CS Professor Emeritus Mike Heath, who served as interim CS department head 2007-2009. "Not just because we have more space, but we have better space that is suited to our needs."

Lead architect Peter Bohlin designed one of the most technologically advanced and beautiful buildings on any campus, combining natural light and open spaces that foster interaction quite literally around every corner. Each hallway has multiple collaborative spaces with comfortable seating and white boards. An entire wing of the first floor is dedicated to student groups like the Association for Computing Machinery (ACM), the Latino/a CS Club (LCSC) and Women in Computer Science (WCS).

According to former ACM chair Rob Pieta (BS CS '13), Siebel Center helps build community among students. "[In the fall semester] we had designers, business majors, and other engineers hang out regularly because it was an engaging environment," Pieta said, noting how students come to ACM's showcase office to do homework and pursue their computing interests.

Siebel Center is also an ideal place to host student-run events like ACM's HackIllinois competition and Reflections | Projections conference, WCS's alumni dinner and recruiting lunches, and CS demonstrations for the college's Engineering Open House (EOH).

"We all call Siebel Center our second home because we use the computers in the labs to get our work done, and when we need a break, we either visit with friends in the atrium or hang out in our office," said WCS president Lavanya Iyer.

Faculty like the building, too. "Siebel Center is a godsend," said CS Professor Roy Campbell, who—like many faculty—remembers how isolating DCL was. "We are a big department, and we were fragmented in that building. The corridors became barriers to interaction. Here we have many places—atrium, halls, and the coffee shop—where we can interact and talk."

under construction

today

For faculty, proximity to their labs and students is a huge plus. "My graduate students used to call DCL the dungeon," said CS Professor Sarita Adve. "They were far away from me, on a different floor from my office, which made spontaneous conversations difficult. Here they are across the hall, and when I go down to the coffee shop, I have serendipitous conversations with my colleagues, as well."

Another benefit of Siebel is the number and quality of classrooms—most of which are equipped with state-of-the-art video capture technology. "Siebel Center was intended as a place where technology would be prototyped," said Drew MacGregor, former CS education and multimedia technologies manager. "We worked out an automated system for recording classroom lectures within the first year or two of moving into the building and we were the prototype for the College of Business' new instructional facility on campus."

Initially, only faculty teaching a course as part of the department's online master's degree program recorded their lectures, but eventually other faculty recorded classes. "One of the main users of this technology wasn't our distance students, but it was our local students who missed a lecture or wanted to review the material," said CS Professor Marc Snir, who was department head from 2001 to 2007.

From a student's perspective Siebel was much more than just classrooms, though. "The building didn't empty at 5:00 when the last class dismissed," explained
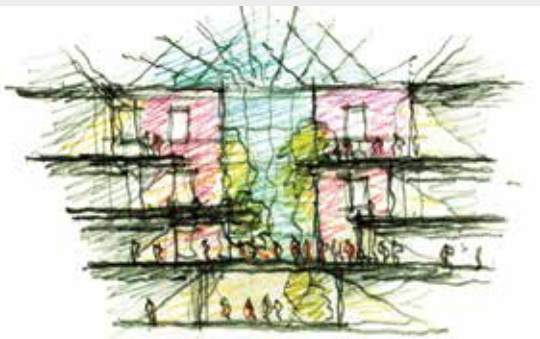
A Measure Of One Man's Gift And Vision

Made possible by a $32 million gift from alumnus Tom Siebel and matching state funds, the 225,000 square foot Thomas M. Siebel Center for Computer Science is an integrated research and education facility for one of the world's top CS departments. The building is home to 56 faculty, 1,200 undergraduates, 500 graduate students, and 40 staff.

Designed by Bohlin Cywinski Jackson, the building's southern exterior pays tribute to the university's traditional red brick architecture, while the glass façade on the north side introduces modern aesthetics. That façade overlooks a green space and two sculptures by renowned artist Howard Ben Tre—the House of Imagination and Bench of Opportunity—gifts to the university in Siebel's honor from the Siebel Systems board of directors.

The building's programmable electronic locks, building automation system, and occupancy sensors that control lighting, heating, and cooling were cutting edge when the building opened in 2004, said Rick Henderson, CS technical services manager. Over the years, the campus has begun adopting much of the technology.

"Bill Kubitz used to laugh and say: 'We weren't on the leading edge we were on the bleeding edge,'" Henderson said, referring to the department's former associate head, who played a huge role in nearly every facet of design detail.

A key feature of the facility's design is how well it anticipated future technology needs. In 2004, smart phones weren't ubiquitous, and the iPad had yet to be invented. Initially the building had 40 wireless access points, which was a lot compared to anywhere else on campus, said Chuck Thompson (BS CS '91, MS '01), former CS IT manager. "Right now the building has 90-some wireless access points and is scheduled to go to 170."

Students have contributed to Siebel Center's technology. For example, the touch panel directory software was originally developed by a team of students that included the creators of the popular Farmville game—Joel Poloney, Luke Rajlich (BS CS '05), and Zao Yang (BS CS '05).

Lead architect Peter Bohlin designed one of the most technologically advanced and beautiful buildings on any campus, combining natural light and open spaces that foster interaction quite literally around every corner.

alumnus Alex Lambert (BS CS '09), a software architect at Twitter. "The space was full of life throughout late nights and weekends. With apologies to Hemingway, if you were lucky enough to have lived in Siebel Center as a student, then wherever you go for the rest of your life it stays with you, for Siebel is a moveable feast."

Interestingly, Campbell noted, the building opened around the time there was a shift in society's perception of computer science and engineering. Companies like Google, Apple, Facebook, and others were creating products and services that had a certain hip and cool factor. This change broadened the graduate student application pool.

"There used to be a view that engineers and computer scientists were nerds that worked in terrible places," said Campbell, former CS director of graduate programs. "We're getting graduate students that we might not have seen in engineering because the discipline holds promise to humanity."

According to CS Department Head Rob Rutenbar, the building has played a vital role in faculty and graduate student recruiting efforts. "We get people on campus, we get them in the building, and there is this inevitable 'wow' reaction, which is a wonderful start to any conversation about why they should pick Illinois versus any of our competitors," said Rutenbar, who acknowledged that he was wowed when he was recruited in 2009 from Carnegie Mellon University. "We continue to be grateful to Tom for his vision and willingness to step up and make this amazing gift."

The building has helped attract stellar undergraduate students, too. "Siebel was one of the reasons I came to the University of Illinois," said Matthew Dierker, a CS senior from Sugar Land, Texas, who had narrowed his choices down to Illinois and University of Texas. "When I visited campus during high school, Siebel seemed like a place where you could make a lot of friends quickly."

In addition to the cultural impact, Siebel Center allowed the department to expand—strengthening existing research areas and moving into new and important fields of study. In the last 10 years, faculty numbers have increased from 39 to 56, and the department has doubled the size of its Human-Computer Interaction research program and started a program in Bioinformatics and

Watch Tom Siebel's remarks at the dedication ceremony in 2004:http://bit.ly/1hmXb3x.

Tom Siebel and Marc Snir at the 2004 dedication event.

Computational Biology. The research budget has grown from $21 million in 2004 to $35 million in 2013. "We couldn't have accommodated that growth in the old building," said Snir.

On April 3, 2014, CS will celebrate the 10th anniversary of the building's dedication, while also hosting a ceremony to invest Professor William Gropp as the first Thomas M. Siebel Chair in Computer Science. The chair is the result of a $2 million gift from the Thomas and Stacey Siebel Foundation.

"Tom Siebel made it possible for us to give a huge number of students the best possible education," said Campbell. "We produce the supreme workforce—the best, in fact—of any competing institution because of the quality and quantity of our students. It's a huge credit to him that lots of people are living their dreams because of the building."

A great deal of CS history is on display in the first floor atrium, but one item in particular demands attention: the LEGO model of Siebel Center, which was designed by CS graduate student Brett Daniel. Inspired by LEGO's release of a new Frank Lloyd Wright building set, Daniel was determined to create his own replica of Siebel Center. He and his team of fellow students finished their masterpiece in 2010; Daniel died of cancer on December 5, 2010, leaving an indelible mark on the department.

Illinois Symposium on Parallelism Celebrates Innovations in the Field

BY TOM MOONE

On September 10 and 11, more than 70 researchers came together in the Thomas M. Siebel Center for Computer Science to discuss innovations in the area of parallel computing.

The Illinois Symposium on Parallelism: Current State of the Field and the Future was in part a celebration of the research work that had been going on at the Illinois Parallelism Center since 2008. The Center was a partnership between the University of Illinois, Intel, and Microsoft during 2008-2010, and between the University of Illinois and Intel during 2011-2013.

> The partnership that the Illinois team has had with our colleagues at Intel and Microsoft has been a uniquely fruitful one.
>
> —Josep Torrellas

The attendees came from a variety of institutions, ranging from the computer industry to top academic departments and government. The workshop included talks, panels, and discussions on parallel applications, software systems, and hardware architectures. Students presented posters and demonstrations. A lively panel on The Future of Parallel Computing ended the workshop. The participants went away with many insights on the challenges facing the field in the next few years, and the tools that researchers possess to address them.

"The partnership that the Illinois team has had with our colleagues in Intel and Microsoft has been a uniquely fruitful one," said symposium organizer and CS Professor Josep Torrellas. "It shows the strength of this University in parallelism research, and the confidence that these research partners have in our technical work."

Professor Josep Torrellas

CS Professor Marc Snir added that the Center is far from just an academic exercise. "The work we have done has already impacted products, and has influenced future products that are still being developed," he said. Electrical and Computer Engineering Professor Wen-mei Hwu agreed: "A Center of this type presents unique opportunities for the students and faculty to work with our leading colleagues in industry."

Symposium participants also received a book called *Making Parallel Programming Easy: Research Contributions from Illinois*. This publication provides a written overview of the research accomplishments of the Center, and includes 22 prominent publications that came out of the Center.

Dong and Li's Innovative Proposal Captures Internet2 Award

BY HERBERT MORGAN

Qingxi Li and Mo Dong

Professor Brighten Godfrey

This past June, PhD students Mo Dong and Qingxi Li won a 2013 Internet2 Innovative Application Award for their software proposal "Black Box Congestion Control (BBCC)."

The award consists of a $10,000 prize and recognizes how much promise their research has for an increasing problem: achieving consistently high performance data transport.

"We think that BBCC is the most promising architecture for next-generation transport control," said CS Professor Brighten Godfrey, Dong and Li's advisor. "We're getting some good evidence that this is the right approach." The team's work addresses a long-term problem with the Internet's transmission control protocol (TCP).

Almost everything we do on networks—all the data, emails, movies, and web browsing—streams through this low-level protocol. TCP's original purpose was to transmit data without loss; its congestion-control algorithms regulate the rate that data are sent in order to be fair to different users sharing the same network links. But its performance frequently degrades on imperfect home wireless links, in modern data centers, and beyond. That translates to slow web browsing, poor-quality video and audio, or slow transfers of huge scientific data sets.

Over two decades, numerous projects have offered tweaks to the TCP protocol—like hundreds of fingers plugging myriad holes in a leaking dike. They all addressed narrow problems when what is needed is a fundamental shift of the architecture to produce a robust design.

"We are tackling the problem from a different angle," Dong said. The key insight of Dong and Li's project is that TCP's fragility is a result of its simplistic control decisions that are disconnected from performance. Instead, BBCC makes decisions directly based on observed performance outcomes: it treats the network as a "black box" where only inputs and outcomes can be observed, and then uses a dynamic learning algorithm to find the input data rate that optimizes performance. The result is that BBCC can achieve high performance across a wide range of challenging conditions.

One challenge in the design was to deal with the competition that ensues when two or more BBCC users both attempt to use the same network link. This situation, Dong realized, can be modeled using game theory. "We could then understand mathematically that a certain class of parameters will result in an outcome that is collectively efficient as opposed to a 'tragedy of the commons' situation," Godfrey said.

The team has released an early version of the software and is preparing for an upcoming publication.

The Cook, the Helper, the Professor & His Award

BY HERBERT MORGAN

A buffet of the Top Ten Papers of the year was presented at the 2013 RECOMB Regulatory Genomics Conference this past November in Toronto, Canada, and included a paper by CS Professor Saurabh Sinha. His paper, "Computational Identification of Diverse Mechanisms Underlying Transcription Factor–DNA Occupancy," takes regulatory genomics a step closer to predicting the location of helpers in the DNA.

If two siblings have the same copy of a gene—for example, the obesity gene—one sibling may be predisposed to obesity and the other may not, because of the regulatory function of cells. In the former sibling, the cells turn on the gene, and in the latter they are turned off.
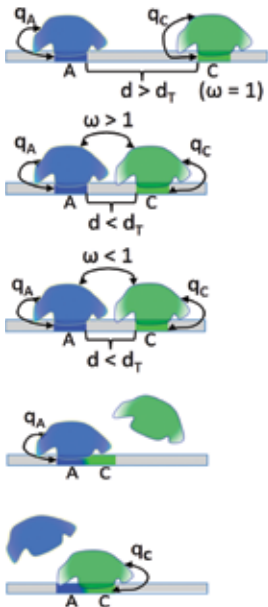
A gene is a recipe in the language of DNA. Whether a gene gets turned on or not depends on a mechanism (the "cook") reading the recipe and "cooking" the protein. A transcription factor (the "helper") sits near a gene, and its job is to enable the nearby gene to turn on by attracting the cook to the gene.

The regulation of genes, whether a gene is turned on or off, plays a prominent role in determining disease, behavior, and other outcomes.

That process can be regulated: in one cell it may be on, and in another cell it may be off; in one person it may be on in every cell, and in another person it may be off in every cell. The regulation of genes, whether a gene is turned on or off, plays a prominent role in determining disease, behavior, and other outcomes.

See the research that won the top-10 honor: http://bit.ly/IZgaFJ

Professor Saurabh Sinha

Modern technology can produce a snapshot of a long DNA string that records all the locations where this helper is sitting. With these locations identified, researchers can determine to which genes the cook will be attracted and, therefore, which genes will be turned on.

Scientists have been using this technology in recent years to locate helpers in the DNA, according to Sinha, who is also affiliated with the Institute for Genomic Biology. However, using this technology requires conducting an experiment that can take as long as two years and cost tens of thousands of dollars.

"We would like to have a poor man's version of that experiment using computational analysis to predict reliably where the helpers are. That's what this paper is about," said Sinha.

Sinha, a bioinformatics faculty member in the CS Department, served as the principal investigator of this paper, published August 2013 in PLOS Genetics. Qiong Cheng, a post-doctoral researcher in his group was the lead author. NIH and NSF provided funding for this research.

Students Win Prestigious Graduate Awards

BY COLIN ROBERTSON

By winning support for their research through nationally competitive awards and fellowships, students at CS @ ILLINOIS continue to show that they are among the best in the world.

NSF Graduate Research Fellowship

The prestigious NSF Graduate Research Fellowship supports a student's graduate studies for up to three years. First year doctoral students Ahmed El-Kishky and Read Sprabery, as well as continuing students Brandon Norick and P. Daphne Tsatsoulis, were among the nearly 2000 new fellowship recipients nationwide. El-Kishky completed a double major in CS and Math at the University of Tulsa, where he was a Presidential Scholar. At Illinois, he is working in the area of data mining. Sprabery graduated from Mississippi State University, where he conducted research on intrusion detection in the power grid. He plans to continue to do research in the field of computer security. A previous recipient of the department's Ray Ozzie Computer Science Fellowship, Norick works with Professor Jiawei Han on heterogeneous information network analysis. Tsatsoulis conducts research in computer vision with Professor David Forsyth, and she is a previous recipient of the department's Andrew and Shana Laursen Fellowship.

Qualcomm Innovation Fellowship

For the third consecutive year, CS students have won a Qualcomm Innovation Fellowship, which includes a $100,000 grant and opportunities to collaborate with Qualcomm researchers. Man-Ki Yoon and Fardin Abdi Taghi Abad were selected based on their research with CS Professors Lui Sha and Marco Caccamo, as well as the Information Trust Institute's Research Scientist Sibin Mohan. They are exploring how to make embedded real-time systems, which are present in devices ranging from automobiles and airplanes to cell phones, secure and safe.
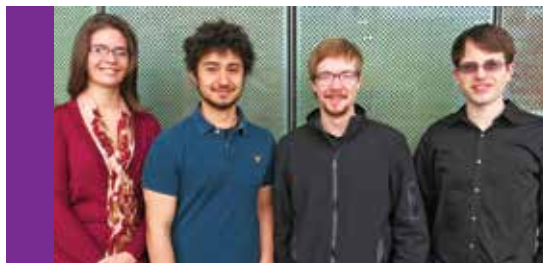
P. Daphne Tsatsoulis, Ahmed El-Kishky, Brandon Norick, and Read Sprabery
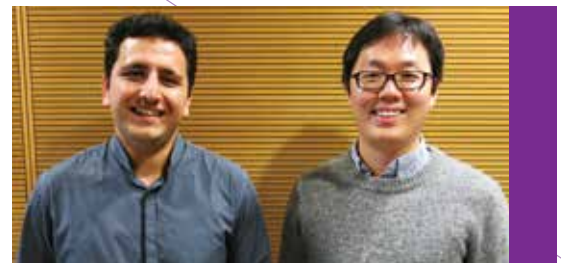
Fardin Abdi Taghi Abad and Man-Ki Yoon

Intel PhD Fellowship

Brett Jones

One of only fifteen Intel PhD Fellowship winners nationwide, Brett Jones conducts research at the intersection of computer vision, human computer interaction, and computer graphics. IllumiRoom, his collaboration with colleagues at Microsoft Research, has received wide media coverage.
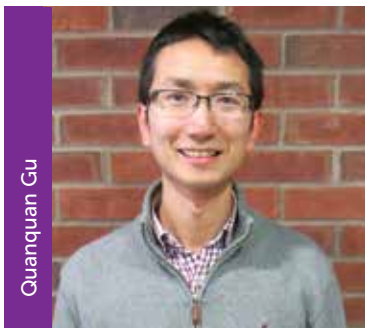
IBM PhD Fellowship

Quanquan Gu

Quanquan Gu was selected to receive a year-long IBM PhD Fellowship for his work with CS Professor Jiawei Han on how to better mine data from large-scale, high-dimensional information networks that contain different categories of objects, like bibliographic data.

Microsoft Graduate Women's Scholarship

Dongjing He

This year, Microsoft awarded ten Graduate Women's Scholarships to top first-year female graduate students across the country, including Dongjing He. Her work with CS Professors Carl Gunter and Klara Nahrstedt focuses on mobile healthcare security and privacy.

Chiang Chen Overseas Fellowship

Chao Zhang

First year doctoral student Chao Zhang was awarded the Chiang Chen Overseas Fellowship, which supports outstanding Chinese students in their studies at top universities around the world. Interested in data mining, Zhang received bachelor's and master's degrees from Zhejiang University.
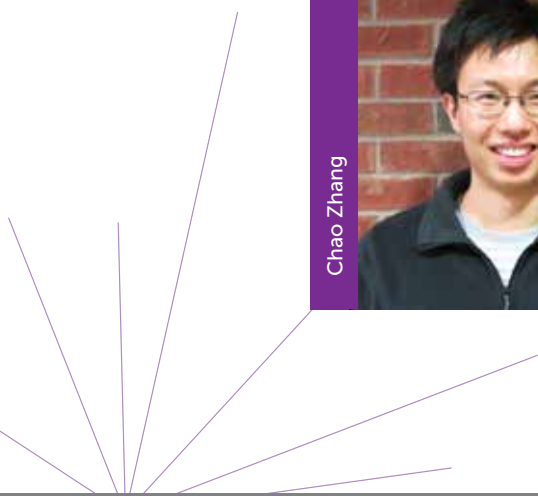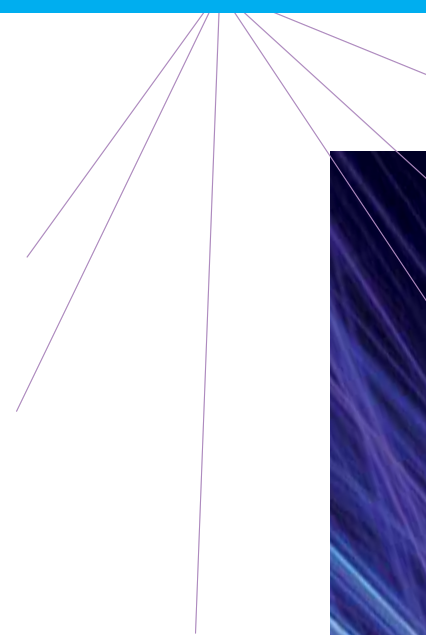
CS Graduate Students Excel at Conference Competitions

BY LEANNE LUCAS

Graduate students in the Department of Computer Science competed in a variety of conference competitions in 2013, and many came home with the highest awards. Following is a list of these competitions, and the students who received recognition for their outstanding work.

MEMOCODE 2013 Hardware/Software Co-Design Competition

Stereo matching was this year's design problem. Given a stereo image pair, the challenge was to infer the depth information for each pixel in the image. Maria Kotsifakou, Theodoros Kasampalis, and Hassan Eslami won in the accuracy-adjusted cost category. Jungwook Choi, an ECE student advised by CS Professor and Department Head Rob A. Rutenbar, won in the accuracy-adjusted performance category.

KDD Cup 2013

Author name ambiguity is a frequently encountered problem in digital publication libraries, and the KDD Cup task challenged participants to determine which authors in a given data set were duplicates. There were 275 participants in this track and CS students Jialu Liu, Chi Wang, and Tobias Lei came in second. A statistics student, Jeffrey Liu, was also a member of the team. They were advised by CS Professor Jiawei Han, who said, "This is a great achievement for our students who worked hard using their talents and collective wisdom."

ACM Multimedia 2013 Grand Challenge Huawei/3DLife

CS Students Shannon Chen and Pengye Xia won the Grand Challenge 3rd place award, with their paper "Activity-Aware Adaptive Compression: A Morphing-Based Frame Synthesis Application in 3DTI." Chen and Xia developed a 3D tele-immersion game engine which uses 3D cameras (Kinect) to capture geographically distributed users and brings them into the same virtual space for interactive activities, such as physical therapy and 3D games. They were advised by CS Professor Klara Nahrstedt.

SC13 Intel Parallel Universe Computing Challenge

This competition tested knowledge of parallel computing through 20 rapid-fire trivia questions and a live coding challenge. The Coding Illini (CS students Nikhil Jain and Xiang Ni, along with NCSA staff Andriy Kot, Omar Padron and Mike Showerman) advanced to the finals after defeating Ohio State and Rice University in the first two rounds. The final match pitted them against the German Gaussian Elimination Squad. The match was neck and neck until the end, when the Germans emerged victorious.

Sun Receives Dissertation Award

BY TOM MOONE

Yizhou Sun (PhD CS '12)

The 2013 ACM SIGKDD Dissertation Award was given to Yizhou Sun (PhD CS '12) for her dissertation "Mining Heterogeneous Information Networks." The SIGKDD website notes that this award "recognizes excellent research by doctoral candidates in the field of data mining and knowledge discovery."

networks represent a much more real world, which contains richer—yet mixed—information," Sun said. "Principles and methodologies that can mine knowledge directly from heterogeneous networks are in great demand."

> " I want to carry on the Illinois tradition of always conducting high-impact and high-quality research. "

"I feel very happy and honored to receive this award," Sun said. "At the same time, I feel so grateful to have had CS Professor Jiawei Han as my advisor and to have been part of such a wonderful group. I really feel this award belongs to the whole group."

"Yizhou is an exceptionally talented and brilliant young researcher," said Han. "Her research has worked out multiple milestone results that are shaping up a young subfield: data mining in heterogeneous information networks."

Sun's dissertation explored the effective analysis of and laid the groundwork for principles of mining large-scale heterogeneous information networks, which can include objects as nodes and relationships as links. These types of networks can make up healthcare networks or social networks like Facebook. Sun's model leveraged the semantics of typed nodes and links in a network to uncover rich knowledge from a network. "Heterogeneous information

Sun is currently an assistant professor of computer science at Northeastern University in Boston, where she is continuing work on semistructured heterogeneous information networks. "I want to carry on the Illinois tradition of always conducting high-impact and high-quality research," Sun said. "Also, I want to be an advisor just like my advisor. Professor Han always encouraged me in the right way and pointed me in the right direction. I had a wonderful time as a PhD student, and I hope my future students will also enjoy their PhD time while delivering high-quality and impactful research."

Sun is co-author (with Han) on the book *Mining Heterogeneous Information Networks: Principles and Methodologies* - Morgan & Claypool, 2012. She is the co-author of more than 40 conference and journal papers and three book chapters. In 2013 she received the Yahoo! DAIS Outstanding Research Award and the Yahoo! Academic Career Enhancement Award.

Debugging Code in **Zero Gravity**:

Illinois Students Participate in NASA Microgravity Program

BY LAWRENCE ANGRAVE

June 2013. At 30,000 feet over the Gulf of Mexico, the heavily customized Boeing 727 changes quickly from a body crunching 2-g climb, where everything is twice as heavy, to free-fall. Your stomach lurches as you float away from the flzr a few seconds the plane will still be gaining altitude, but it's now accelerating towards Earth with you inside. Inside the plane, you instinctively yelp with excitement—you're weightless and floating in the air. An unbelievable, out-of-this world sensation.

"You don't get tired of microgravity—it's just really cool every time," says engineering physics major Dan Hirnyj, team leader of the Moon Goons. The journey to this point has been an intense experience for the University of Illinois students: Alejandro Gomez, Danylo Hirnyj, Ehsan Keramat, Linas Sulas, Sam Liu, and Sunny Gautam. Each year NASA receives over 70 proposals for the Reduced Gravity program and invites around 15 of the best proposals to Houston's Johnson Space Center and to fly at Ellington field. The Moon Goons' hard work also earned them a week at NASA's base at Houston to learn about space, safe "0g" flying, and to prepare and then fly their quadrocopter experiment.

Thursday, the first of two 0-g flight days, includes team members Dan, Alejandro, Sunny, and myself, CS faculty member Lawrence Angrave, the photojournalist for the team.

It takes a couple of parabolas to gain enough experience to attempt the experiment.

On the third parabola, Alejandro is at the laptop ready to tell the quadrocopter to fly to the dock. The laptop is the brains behind the quadrocopter, translating the real-time camera images transmitted from the quadrocopter into power changes of each of the four motors. Thanks to electrical engineering major Sunny Gautum, it's reliably receiving a wireless

> ## The Moon Goons' experiment is inspired by the original lunar landing module.

video stream of 15 pictures per second from a camera mounted on the side of the quadrocopter.

The laptop is running a vision algorithm that searches for the red cloth background and quickly makes power adjustments to four propellers to turn the drone towards the red cloth. "Analyzing images is an active area of computer science research," explains computer science major Sam Liu,. "We simplified the processing required by using a large red cloth and a faster color-moment algorithm. It's fast and sufficient to tell us when the craft has rotated away from the desired docking angle so we can add extra thrust to some of the fans."

The Moon Goons' experiment is inspired by the original lunar landing module, but today they are testing two new docking systems: first using a vision system to control the quadrocopter, and second, using

Lorentz-force magnetic braking to slow the machine as it nears the target.

Due to the 30-second duration of each 0-g parabola, the drone's movements were purposely constrained to one linear and one rotational degree of freedom. These constraints are now the cause of the Moon Goons' very own problem at Houston. The fans whirr and pulse but are ineffective against the friction. The drone refuses to fly. Dan and Sunny open up the safety cage, designed by Linas, and attempt to free the quadrocopter while Alejandro debugs and recompiles the code, his long dreadlocks, unshackled from gravity's tug, explore and waft gently in every possible direction. This is first time I've seen Illinois students debug code at 30,000 ft in 0 g. But the quadrocopter refuses to cooperate.

Thursday night at the Moon Goons Mission HQ (hotel room 208). A last chance to make some final minor tweaks. Realizing that minor tweaks might be insufficient, they rewrite their control software and burn the midnight oil.

Friday 7 a.m. Clear skies–perfect flying conditions for the reduced gravity plane. With Ehsan and Sam flying, Dan, Sunny, and Alejandro must now wait two hours for news. This last flight represents two years of work. All but Sam are graduating seniors, so this is the last chance they have to be together as a student team. It also represents the Moon Goons' persevering team spirit and their ability to take their Illinois experience out of the classroom and into the sky. The triumphant rise of the quadrocopter on the second day is an appropriate finale.

The week at Houston has been more than just the reduced gravity flight. The team learned teamwork and technical skills, and had access to full-time NASA engineers."

From left: Ehsan Keramat, Sam Liu, Alejandro Gomez, Sunny Gautam, and Danylo Hirnyj

Shah Receives Ernst & Young Scholarship in Recognition of Innovation

See CS alumnus Max Levchin's interview at Chicago Ideas Week at http://bit.ly/1chdOyz.

In October, Akash Shah, a double major in CS and Aerospace Engineering, received a $5,000 scholarship from Ernst & Young that was presented at Chicago Ideas Week. According to its website, Chicago Ideas Week is intended to bring together hundreds of the world's leaders "to inspire, connect, and activate the city of Chicago and Beyond." The event brings in over 20,000 people to hear from leaders in a variety of subjects.

Shah was recognized for being a particularly innovative student. During his time at Illinois, Shah has received several recognitions for his leadership innovation, including the Edith and Harry Darby Leadership Award and the Dale S. Margerum Award. He is a member of the Chancellor's Honors Program and is a James Scholar. He has had internships at Goodrich Aerospace Europe, Rockwell Collins, and Microsoft. After graduation, he will be joining Microsoft as a Program Manager in the Windows User Experience team.

The Ernst & Young scholarship was given to Shah in conjunction with an award that Ernst & Young gave to Max Levchin (BS CS '97), who was being honored for his tech innovations as founder of PayPal, HVF, and Affirm. Shah's scholarship was presented in Levchin's name.

"I am honored to have received this award at Chicago Ideas Week," said Shah. "I was grateful to have been in the company of Max Levchin, whose innovations in the online world are an inspiration for me."

ThinkChicago: Lollapalooza

In August 2013, the City of Chicago hosted ThinkChicago: Lollapalooza, an event that brought 100 students from the top U.S. engineering schools together to experience some of technological innovations that are taking place in the city—and to attend the Lollapalooza music festival.

CS students Bri Chapman and Rob Pieta (BS CS '13) were two of the select group that attended this ThinkChicago event. Chapman is the president and founder of CocoaNuts, a student organization that encourages and facilitates iPhone and iPad app developers. Pieta was president of the University of Illinois student branch of ACM.

Along with the other attendees, Chapman and Pieta had the opportunity to enjoy the music festival; tours of local tech companies such as Groupon, Belly, GrubHub, and Accenture; and a series of panel discussions.

"The event was about bringing bright students to Chicago—to show them there is a vibrant tech community in Chicago, and how it's an option," said Pieta.

"I really enjoyed interacting with companies and founders who attended the events," said Chapman. "Of course, the music was great, too."

At ThinkChicago: Lollapalooza, CS students Rob Pieta (left) and Bri Chapman (right) met several entrepreneurs from the Chicago area, including Matt Maloney of Grubhub (center).

Lifflander Receives International Recognition for HPC Research

BY LEANNE LUCAS

CS graduate student Jonathan Lifflander is the recipient of the 2013 ACM/IEEE-CS George Michael Memorial HPC Fellowship in recognition of his research excellence. His research focuses on parallel computing, systems, and high-performance computing in the Parallel Programming Laboratory.

"In high-performance computing [HPC]," said Lifflander, "you take scientific simulations and make them run efficiently on a supercomputer." Lifflander said his work specifically targets very irregular problems. "When you look at a regular problem, you have an idea of how many resources it will take, or how to run it. But I focus on problems that are irregular; the structures are not obvious when you're starting. The system that's running the application under the hood needs to be aware of what's happening and needs to be able to dynamically adjust the resources to match the computational characteristics.

"Some of my work is on fault tolerance," he continued. "When you have a machine with hundreds of thousands of processors, the probability of one failing is pretty high. The question is, how do you run a scientific experiment for a long time and make it run past the fault?"

In a recent paper for ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'13) Lifflander showed how a specific algorithm used for scaling irregular problems could be made fault tolerant with very low overhead.

Lifflander began college at the age of 15 at Washington State and graduated with full honors. He came to the University of Illinois for his PhD because of the international reputation CS @ ILLINOIS maintains in the field. "Some of the first parallel computers were built here," he said, "and this institution has maintained a tradition for very strong research in the field."

Lifflander is passionate about holistic research in computer science, "going from theory all the way down to implementation. I'm very interested in applying it directly to science. Not to show off the technique, but to show how relevant it is," he concluded. "Because at the end of the day, computer science is here to enable so many other things."

Bringing Computer Science into local Schools

BY LEANNE LUCAS

The Department of Computer Science is working with educators in Champaign, Illinois, to bring computer science into elementary and secondary classrooms.

CS Professors Lenny Pitt and Cinda Heeren have worked together many years to train teachers and attract students to the field of computing. This year, they were joined by Professor Craig Zilles in designing a short computer science (CS) curriculum for high school teachers.

"Now we are doing significant work with the Champaign Unit 4 school district," said Pitt, the director of undergraduate programs. "We're hoping to have an impact on all students from elementary to high school."

At the elementary level, Pitt has been working with a group of local business leaders through Illini4Kids and the Office for Mathematics, Science, and Technology Education (MSTE) at the University of Illinois to offer workshops to elementary school teachers using the Etoys programming environment. Pitt said even children in kindergarten can begin the process of learning how

to program. "Of course, at that age, they are not programming so much as they are clicking and dragging. But they know they can make things move, and they're very eager to learn," he said. "It doesn't take long for them to understand that if they drag the third tile down into their program script, their object will move forward. The fourth tile down will be the one that makes it turn. . . . So they can really to start to experiment with a lot of geometric concepts at a very young age."

Last summer Pitt worked with 20 teachers from Kenwood Elementary School in Champaign. "As a result, there are nine teachers in the school who are actively teaching elementary children how to program," he said. "What's really exciting is that these teachers see it not as a 'Let's all learn to program' activity, but more of an opportunity to incorporate programming into as many subject areas as possible."

The project has been able to overcome numerous obstacles to bringing CS into elementary schools, such as the number of computers available, teachers' professional development, and the need for a curriculum that fits current education guidelines. But, as MSTE Director George Reese said, "This project has been a happy conspiracy of Unit 4, local business partners, the MSTE Office, professors from Computer Science and the College of Education who have come together to work on breaking down or jumping over these barriers to do something meaningful toward preparing students for the 21st century skills that they will need."

Pitt has also focused on high school CS education. For the last several years he has run a Computer Science for High School (CS4HS) workshop, funded by Google. This past summer, he ran a week-long workshop funded by the National Science Foundation to prepare Champaign high school teachers to provide almost all 9th grade students in the Champaign school district with a three-week unit on computer programming and computational thinking as part of their freshman seminar class. The curriculum for this unit was co-written by Professors Pitt, Heeren, and Zilles, together with Champaign high school teachers.

Without their expertise and guidance, the progress we've made in such a short time wouldn't have been possible.

Dr. Laura Taylor, the Assistant Superintendent of Achievement and Student Services for Unit 4, said five computer science courses at the high school level have been approved for implementation next year.

"Unit 4 is very grateful for the support that's been provided by Dr. Pitt and Dr. Reese, as we launch our K-12 computer science course of study initiative," Taylor said. "Without their expertise and guidance, the progress we've made in such a short time wouldn't have been possible."

In addition to working with local educators, Pitt said they are also talking with the Illinois State Board of Education and representatives in the Illinois legislature to have computer science recognized for math or science credit in the high schools.

"Recently, Illinois passed a law requiring schools that offer a computer science advanced placement (AP) class, to recognize it as a class that qualifies for the math or science requirement for graduation," said Pitt. "That's a big step forward, because it provides incentive for students to take those courses.

"But the number of AP exams that are taken in computer science is less than one percent," he continued. "We'd like to get the non-AP classes that are computer science-focused recognized for math and science credits as well. That's a conversation that's just starting."

In the meantime, Pitt said he is very encouraged by the interest and enthusiasm he sees from local administrators, teachers and students for computer science.

"This is a fantastic opportunity to grow, and build a computing pipeline from kindergarten through high school in this district, to make sure all the students receive some kind of computer science education," he concluded.
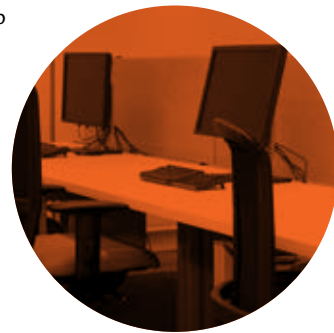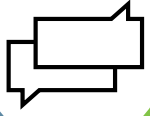
Forsyth Named ACM Fellow for 2014

BY TOM MOONE

CS Professor David Forsyth has been named a Fellow by the Association for Computing Machinery. He is one of 50 researchers honored for 2013, and he was recognized "for contributions to computer vision."

The ACM Fellows Program celebrates the exceptional contributions of the leading members in the computing field. These individuals have helped to enlighten researchers, developers, practitioners, and end-users of information technology throughout the world. These new ACM Fellows join a distinguished list of colleagues to whom ACM and its members look for guidance and leadership in computing and information technology. Forsyth is well-known for his research in geometric methods in object recognition, interpreting color images, the interaction of words and pictures in an image, shading and reconstruction, among other topics. "If it's got a picture in it, I'm interested in it," said Forsyth.

Some recent work Forsyth has done with his student Kevin Karsh has developed methods for embedding

See the work Forsyth and his students are doing in adding objects to legacy photographs: http://bit.ly/r1n6D7.

> One of the biggest mysteries about how people work is how they see, which is still extremely poorly understood.

computer-generated objects into legacy photographs. Forsyth sees applications for this work in such fields as real estate, in which potential home buyers can place images of furniture into photos of empty rooms, or for furniture companies to allow customers to see what a new piece of furniture would look like in a photo of their home.

Forsyth first became interested in computer vision as an undergraduate at the University of Witwatersrand in Johannesburg, South Africa. There he did an undergraduate final project on particle sized distribution analysis using photographs. This was an important project for local gold mining companies, and set Forsyth off on his career in computer vision. "I got involved in that, and I found it interesting," said Forsyth.

He then went to the UK to complete his graduate work. From there, he went on to positions at the University of Iowa and the University of California, Berkeley. Forsyth has been at the University of Illinois since 2004.

Forsyth finds the mystery of vision to be compelling. "One of the biggest mysteries about how people work is how they see, which is still extremely poorly understood," he said. "I think what I like the most about this work is we understand it so poorly and it's so fundamental a mystery."

Forsyth is co-author of *Computer Vision: A Modern Approach* (Prentice Hall), now in its second edition. In 1992 he received a both a Research Initiative Award and a Young Investigator Award from the National Science Foundation. He received the IEEE Technical Achievement Award in 2006 and was named an IEEE Fellow in 2009.

The 2013 class of ACM Fellows will be formally recognized in June at the association's annual awards banquet held in San Francisco.

Nahrstedt Named a Member of the German National Academy of Sciences Leopoldina

BY JENNY APPLEQUIST AND KIM GUDEMAN, COORDINATED SCIENCE LAB

CS Professor Klara Nahrstedt has been named a member of the German National Academy of Sciences Leopoldina, Germany's foremost academic society. Nahrstedt's selection to Leopoldina's membership is in recognition of her scientific achievements and impact on science. "It's incredible to be recognized," said Nahrstedt, the Ralph and Catherine Fisher Professor of Computer Science and acting director of the Coordinated Science Lab. "It was unexpected, and I'm honored to receive this award."

Nahrstedt has long been a leading researcher in multimedia systems, having made multiple seminal contributions in quality of service (QoS) management for distributed multimedia systems.

Her early work on QoS brokerage with QoS translation, negotiation, and adaptation services set between application and transport layers that enabled end-to-end QoS contracts, published as "QoS Broker" in 1995, changed the way multimedia end-system architectures are designed and built.

She later extended that work with a novel adaptation scheme that modeled the end-to-end QoS problem based on a control-theoretical approach— which was the first use of control theory in multimedia systems. She was also the first to address the issue of QoS-based routing in ad hoc networks.

In addition, she made important contributions in the area of multimedia scheduling for mobile devices. Her fundamental work on energy-efficient, dynamic, soft-real-time CPU scheduling for mobile multimedia devices, and her contributions to the development of "GRACE-OS," one of the early energy-efficient OS for mobile multimedia devices, have been widely recognized.

Nahrstedt is widely recognized as a pioneer in the 3D teleimmersive systems and networking field. Her research group developed the first multi-view 3D video adaptation framework for bandwidth management, and the first view-casting protocols for multi-view 3D video. Her group also created new metrics for 3D immersive video and the first comprehensive framework for multi-modal session management in teleimmersive environments based on sound theoretical underpinnings.

Nahrstedt received her bachelor's in mathematics and master's degree in numerical analysis from Humboldt University, Berlin, Germany. She was a research scientist in the Institute for Informatik in Berlin until 1990. After receiving her PhD from the Department of Computer and Information Science at University of Pennsylvania in 1995, she joined CS @ ILLINOIS. She is a Fellow of IEEE and ACM. She has enjoyed strong working relationships with German colleagues throughout her career, and in 2009 she was honored with the prestigious Humboldt Research Award, allowing her to deepen ties with German colleagues.

Jacobson Named an INFORMS Fellow

BY SNEHA SHUKLA

The Institute for Operations Research and the Management Sciences (INFORMS) recognized CS Professor Sheldon Jacobson as a fellow for his lifetime achievement in the field of operations management. This is the highest distinction within INFORMS and is awarded to only 12 members out of a network of 12,000 every year.

"It is a privilege to be recognized by my peers for this distinction," said Jacobson.

Jacobson's contributions to operations management are extensive. His most notable studies have shed light on how the growing rate of obesity in the US is correlated to higher fuel costs, the need to invest and position security devices at airports and even the odds a basketball seed has in winning the NCAA tournament.

Recently, Jacobson was selected as a member of a National Research Council Committee to evaluate the safety of advanced imaging technology used in airport screening. In particular, the committee is examining the safety of backscatter X-ray machines deployed at security checkpoints across the US. These machines were recently pulled out of service due to privacy concerns, though some have wondered if there were potential health risks due to minor levels of radiation.

"The charge of our committee is to look at what people have done to evaluate the safety of these devices and make a recommendation as to the validity of the studies that have been conducted and provide new potential insight on whether the devices are safe to the flying public," said Jacobson. "We have a charge that will last for the next fourteen months and we'll have a number of on-site and off-site meetings to discuss the literature and assess the safety of these devices."

Jacobson is also serving in his second year as program director at the National Science Foundation, where he is responsible for setting and guiding the national agenda for his field.

"As program director, I interact with the entire operations research community, providing guidelines and guidance. I assess and evaluate research proposals and recommend funding for some of these proposals," said Jacobson, "I interact with the community to help it move forward in a positive direction that will be for the greatest good and advance knowledge in the field."

This is the highest distinction within INFORMS and is awarded to only **12** members out of a network of **12,000** every year.

informs

See Sheldon Jacobson discuss his research on airport security: http://bit.ly/1gJdB95.

Snir Receives 2013 IEEE Computer Society Seymour Cray Award

Parallel computing expert and CS Professor Marc Snir, a major contributor to the Message Passing Interface, has been named the recipient of this year's IEEE Computer Society Seymour Cray Computer Engineering Award.

Snir is director of the Mathematics and Computer Science Division at Argonne National Laboratory and the Michael Faiman and Saburo Muroga Professor in the Department of Computer Science at Illinois, where he served as department head from 2001 to 2007. He is currently pursuing research in programming environments for high-performance computing.

One of IEEE Computer Society's highest awards, the Seymour Cray Computer Engineering Award is presented in recognition of innovative contributions to high-performance computing systems that best exemplify Cray's creative spirit.

The award consists of a crystal memento, a certificate, and a $10,000 honorarium.

Until 2001, Snir was a senior manager at the IBM T. J. Watson Research Center, where he led the Scalable Parallel Systems research group responsible for major contributions to the IBM SP scalable parallel system and to the IBM Blue Gene system.

He received a PhD in mathematics from the Hebrew University of Jerusalem in 1979, worked at New York University on the NYU Ultracomputer project in 1980-1982, and was at the Hebrew University of Jerusalem in 1982-1986, before joining IBM.

An Argonne Distinguished Fellow, AAAS Fellow, ACM Fellow, and IEEE Fellow, Snir has published numerous papers and given many presentations on computational complexity, parallel algorithms, parallel architectures, interconnection networks, parallel languages, libraries, and parallel programming environments.

Seymour Cray was a US electrical engineer and supercomputer architect who designed a series of computers that for decades were the fastest in the world. He founded Cray Research, which would build many of these machines. Called "the father of supercomputing," Cray has been credited with creating the supercomputer industry.

Kalé Part of Illinois Team Honored by HPCwire
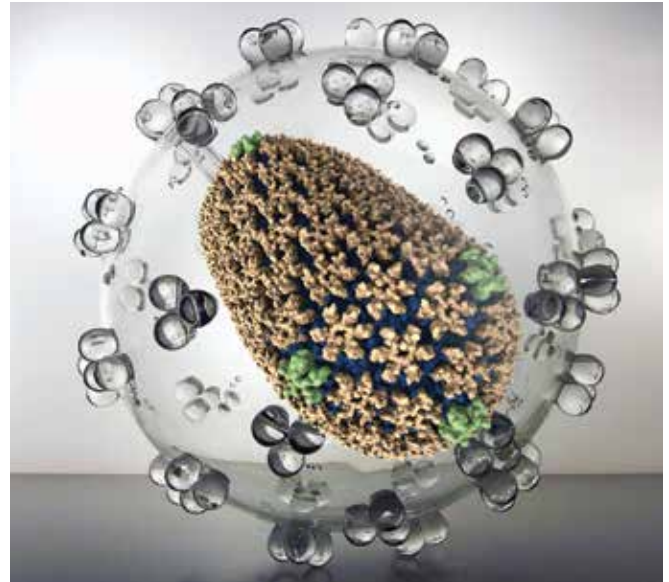
At the 2013 International Conference for High Performance Computing, Networking, Storage and Analysis (SC13), an Illinois team of researchers received the HPCwire Editors' Choice Award for Best Use of HPC in Life Sciences for the use of the Blue Waters supercomputer to achieve a significant breakthrough in the understanding of HIV.

The 2013 HPCwire Readers' and Editors' Choice Awards were announced at the start of the Opening Reception at SC13 in Denver, Colorado.

The award recognizes research conducted by Physics Professor Klaus Schulten and his collaborators, including CS Professor Sanjay Kalé. Using the NAMD molecular dynamics code developed at by Kalé and his research group, Schulten and his team used Blue Waters to determine the precise chemical structure of the HIV capsid, a protein shell that protects the virus's genetic material and is a key to its virulence. The capsid has become an attractive target for the development of new antiretroviral drugs. The results of the team's unprecedented 64-million-atom simulation were published earlier this year in the journal *Nature*.

The HPCwire Readers' Choice and Editors' Choice Awards winners are selected by a polling of HPCwire's global audience for the Readers' Choice, combined with winners selected by a panel of editors, staff executives and HPC luminaries for the Editors' Choice.

Widely recognized as one of the most prestigious awards presented during the annual Supercomputing Conference, the awards honor demonstrated excellence and outstanding technological advancements achieved by the HPC community.

Recipients of the HPCwire Editor's Choice Award. Kneeling (from left): Bill Kramer, director of Blue Waters; and John Stone, senior programmer with Beckman Institute. Standing: Tom Tabor, CEO of Tabor Communications, publisher of HPCwire; Klaus Schulten; and Sanjay Kalé.

3M Funds CS Fellowships

BY COLIN ROBERTSON
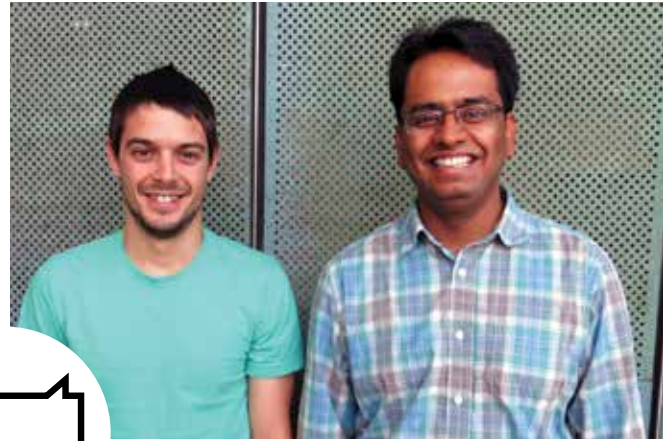
Joe DeGol and Saurabh Singh

Proud of its reputation as an innovative company, 3M's research has resulted in products like improved sandpaper, Scotch Tape, and Post-it Notes. But those prominent consumer products represent only a fraction of what the company does and, for some time now, that has included CS research. That's a reason why 3M is funding fellowships for CS doctoral students at Illinois.

> **The 3M Fellowships have been crucial for supporting the best students and developing algorithms to visually analyze materials and objects.**

"We believe that the unique skill sets of our recent hires, which were built in top universities like Illinois, coupled with our 3M CS technologies, will help drive the next generation of advanced products," said Liu Qiao, Technical Director for the 3M Software, Electronics, and Mechanical Systems Laboratory. "Our team thrives on the exciting challenge of combining traditional 3M products with CS technologies. For example, 3M software systems that incorporate my lab's CS algorithm developments are being deployed into business units in areas such as health care reimbursement systems, safety and security (issuing license plates and driver's licenses, reading passports), optical films, and, yes, even Post-it Notes."

This year, Joe DeGol was the second student selected to receive a 3M Fellowship, joining lab-mate Saurabh Singh. Both are second year computer vision students. A third fellow will be chosen for fall 2014, and each student will receive three years of funding.

Advised by Professors David Forsyth and Derek Hoiem, Saurabh is researching how to better predict the location, orientation, and extent of objects within an image. Such information is necessary to gain a better understanding of a scene and the interactions of its constituent parts. This has applications in several areas such as home robotics, where the effectiveness of a robot depends heavily on its understanding of its environment.

According to Saurabh, "the 3M Fellowship has been crucial in providing the necessary support and encouragement for focusing on important things. Interaction with visitors from 3M has further educated me on various potential applications of my research and missing pieces that will make it applicable to real-world problems."

Joe is investigating ways to automatically create 3D models and inspect infrastructure—like bridges, roads, tunnels, and buildings—using autonomous flying robots. Such systems need to be able to visually recognize a variety of building materials as well as the signs of a potential fault—which can vary by material. Joe is working with Professors Hoiem, Timothy Bretl (Aerospace Engineering), and Mani Golparvar-Fard (Civil and Environmental Engineering). He recently presented his research at a symposium hosted in St. Paul, Minnesota for 3M Fellows across the Midwest.

"The 3M Fellowships have been crucial for supporting the best students and developing algorithms to visually analyze materials and objects. Discussions with 3M's researchers also help illuminate potential impacts of our algorithms and guide further research," says Hoiem.

2014 Siebel Scholars

BY TOM MOONE

Five exceptional Computer Science graduate students have been named to the Siebel Scholars Class of 2014.

"The Siebel Scholars Program gives recognition to some of the top students in the top graduate programs in the world," said Illinois College of Engineering Dean Andreas Cangellaris. "We salute these students whose hard work, dedication, and creativity have brought distinction upon themselves and the University of Illinois."

DONGJING HE is a research assistant in both the Illinois Security Lab and the Multimedia Operating System and Networking Group, advised by CS Professors Carl Gunter and Klara Nahrstedt. Her research focuses on improving security and protecting privacy in healthcare systems, with emphasis on Android mobile sensing. She is a recipient of the 2013 Microsoft Research Graduate Women's Scholarship, one of only ten recipients in North America.

She received her bachelor's degree in information security engineering from Shanghai Jiao Tong University in 2011. While an undergraduate, she was an exchange student at the Lund University, Sweden, and she worked as an SRE intern for eBay Inc., Shanghai. She worked as a full-time SDE for Marvell Technology Group, Shanghai in 2012, and worked at Google Inc. as an SDE intern in the summer of 2013.

GAURAV LAHOTI is working with CS Professor Carl Gunter. His interests lie in the field of computer security and privacy, and he is currently researching a secure and privacy-preserving Vehicle Miles Travelled tax mechanism for battery vehicles. He is a CS graduate ambassador and a board member of the Indian Graduate Student Association. This summer he was an intern at Fujitsu Laboratories of America.

Lahoti has bachelor's and master's degrees in civil engineering from Indian Institute of Technology Bombay. While there, he worked on machine learning algorithms and researched how to extract building footprint area from satellite imagery to assess seismic risk of various parts of India. As an undergraduate, he was actively involved in theatre and short film making.

ARUN MALLYA is working on the application of machine learning techniques to object recognition and detection. He is currently working with CS Professor Svetlana Lazebnik on creating scalable and robust object detectors from an indefinite number of training examples. His previous work includes research in data mining, human mobility models, and complex networks.
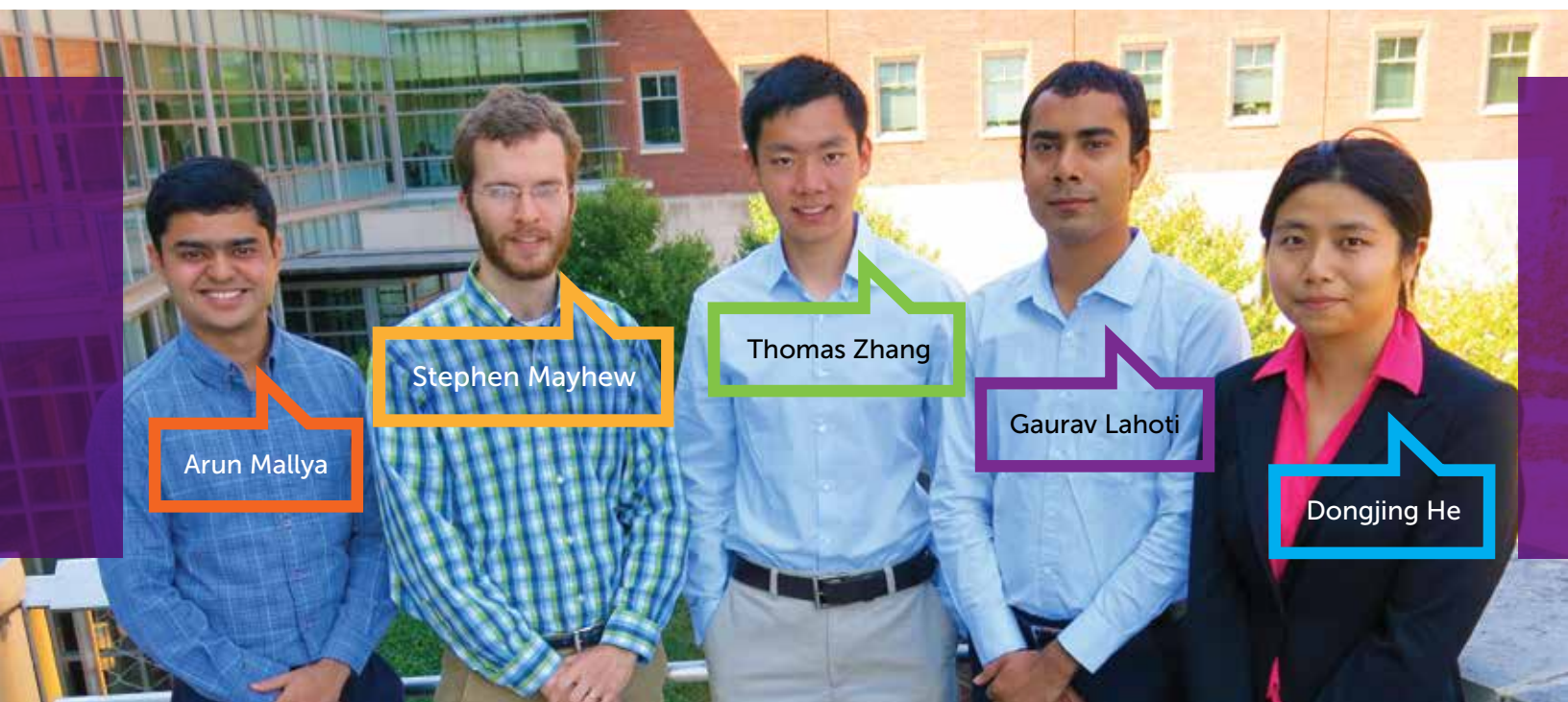
Arun Mallya

Stephen Mayhew

Thomas Zhang

Gaurav Lahoti

Dongjing He

Prior to joining Illinois, Mallya graduated with honors from the Indian Institute of Technology at Kharagpur with a bachelor's degree in computer science and engineering. As an undergraduate, he interned at the École Polytechnique Fédérale de Lausanne in Switzerland where he worked on privacy of mobile phone users under Dr. Murtuza Jadliwala.

STEPHEN MAYHEW is studying natural language processing and machine learning under CS Professor Dan Roth. His research is on the use of trustworthiness algorithms for improving information extraction.

Mayhew holds an undergraduate degree in computer science, with a minor in music, from Rose-Hulman Institute of Technology. He has worked at MIT Lincoln Laboratories and has participated in the SCALE2013 workshop at Johns Hopkins University's Human Language Technology Center of Excellence. He also has a great aptitude for music. An accomplished violinist, he was a member of the Indiana University pre-college string program during high school, and played with the Violin Virtuosi. Throughout high school and college, he was a violinist in the Terre Haute Symphony Orchestra.

He has performed with the Indianapolis Symphony Orchestra as a part of their Side-by-Side program.

THOMAS ZHANG recently completed his fourth year in the five-year BS/MS program in computer science. His research focuses on the exploitation of textual information in social networking contexts. With CS Professor ChengXiang Zhai, he is working on developing a novel software system to enable users to flexibly navigate a multiple forum landscape. Previously, he worked on designing and modeling a scheduler to solve the problem of congestion on servers with temporal dependent workloads.

Zhang has helped teach several CS classes, held internship positions in both the finance and technology industries, and was named a Jump Trading Scholar. As a senior, he was awarded the Michael S. Hughes Award for Software Engineering for SnapMeds, an Android application that simplifies the tracking of prescription medications. In his spare time, Zhang engages in local community service initiatives and maintains an active role as a member in the Phi Kappa Phi Honor Society.

Celebration of Excellence
Student Awards

CS @ ILLINOIS honored many students who have received scholarships and fellowships this academic year. We extend congratulations to these individuals whose hard work is a credit to themselves and a source of pride for the department.

Ray Ozzie Computer Science Fellowship

AUGUST SHI graduated in May 2013 from the University of Texas at Austin, where he received bachelor's degrees in both computer science and electrical engineering. He obtained his degree in computer science through the Turing Scholars Honors program. At Illinois he works with CS Professor Darko Marinov in the area of software engineering.

GRADUATE FELLOWSHIPS & AWARDS

3M FOUNDATION FELLOWSHIP
Joseph DeGol
Saurabh Singh

ANDREW AND SHANA LAURSEN FELLOWSHIP
Konstantinos Koiliaris
Cecilia Mauceri
Yi Zhang

CHIANG CHEN OVERSEAS FELLOWSHIP
Chao Zhang

CHIRAG FOUNDATION GRADUATE FELLOWSHIP IN COMPUTER SCIENCE
Shan Jiang

COMPUTER SCIENCE EXCELLENCE FELLOWSHIP
Cristina Abad
Peter Dinges
Paul Eller
Ting-Yu Wang

DEBRA AND IRA COHEN GRADUATE FELLOWSHIP IN COMPUTER SCIENCE
Charles Blatti

DISSERTATION COMPLETION FELLOWSHIP
Kyle Fox
Roshanak Zilouchian

GOOGLE ANITA BORG MEMORIAL SCHOLAR, FINALIST
Harshitha Menon

IBM PHD FELLOWSHIP
Quanquan Gu

INTEL PHD FELLOWSHIP
Brett Jones

MAVIS FUTURE FACULTY FELLOW
William Mansky

MICROSOFT GRADUATE WOMEN'S SCHOLARSHIP
Dongjing He

NSF GRADUATE RESEARCH FELLOWSHIP
Ahmed El-Kishky
Brandon Norick
Read Sprabery
P. Daphne Tsatsoulis

NSF GRADUATE RESEARCH FELLOWSHIP, HONORABLE MENTION
Joseph DeGol
Frederick Douglas

NSF IGERT FELLOWSHIP
Erin Molloy

OUTSTANDING TEACHING ASSISTANT, SPRING 2013
Ming Ji
John Lee
Mehwish Riaz
Nisha Somnath
Xiaolong Wang

QUALCOMM INNOVATION FELLOWSHIP
Fardin Abdi Taghi Abad
Man-Ki Yoon

RAY OZZIE COMPUTER SCIENCE FELLOWSHIP
August Shi

RICHARD T. CHENG ENDOWED FELLOWSHIP
Yu Wu
Honglei Zhuang

SABURO MUROGA ENDOWED FELLOWSHIP
Apollo Ellis
Farah Hariri
Jiajun Lu
Yusuf Cem Subakan
Yu-Chun Yen

SIEBEL SCHOLAR
Dongjing He
Gaurav Lahoti
Arun Mallya
Stephen Mayhew
Thoms Zhang

SOHAIB AND SARA ABBASI COMPUTER SCIENCE FELLOWSHIP
Muhammad Huzaifa
Mariyam Khalid
Muhammad Naveed
Shayan Saeed
Rashid Tahir

STATE FARM COMPANIES FOUNDATION DOCTORAL SCHOLAR
Yonatan Bisk
Dennis Griffith
Erin Molloy

SURGE FELLOWSHIP
Jessica Mullins
Imani Palmer

WING KAI CHENG FELLOWSHIP
Ritwika Ghosh
Kent Quanrud

UNDERGRADUATE AWARDS & SCHOLARSHIPS

CHANNING BROWN SCHOLARSHIP
Matthew Rasmussen

CISCO WOMEN'S UNDERGRADUATE SCHOLARSHIP
Hanna Koh
Annie Rong

CRA OUTSTANDING UNDERGRADUATE RESEARCHER AWARD, FINALIST
Rohan Sharma

FRIMA LUKATSKAYA SCHOLARSHIP
Alexander Chiang

JUMP TRADING SCHOLAR
Son Nguyen
Jiangchuan Zhou
Thomas Zhang

ROWE FAMILY SCHOLARSHIP
Muyiwa Adelabu

SANDRA L. AND JOHN P. RANKIN ENGINEERING SCHOLARSHIP
Madeline Psenka

SARA AND LOUIS COHEN SCHOLARSHIP
Cristian Ayala

SPYGLASS ENDOWED SCHOLARSHIP
Karolina Rys
Claire Sheong

STATE FARM COMPUTER SCIENCE SCHOLARSHIP
Corly Leung
Tyler Traywick
Victorial Vanderbach
Megan Wu

WILLIAM AND RUTH WITT SCHOLARSHIP
Lin Ding

GRACE HOPPER CELEBRATION AWARDS

CS GRACE HOPPER CELEBRATION SCHOLARSHIP
Bilge Acun
Tanvi Jindal
Maxie Schmidt
Xiaodan Zhang

NEUSTAR GRACE HOPPER SCHOLARSHIP
Katelyn Chrzanowski
Kavya Gundavaram

YAHOO! GRACE HOPPER CELEBRATION SCHOLARSHIP
Alice Lai
Lily Sellers
Emily Tran
P. Daphne Tsatsoulis

RAY OZZIE (BS CS '79) spent a lot of his time as a CS student programming PLATO, the first computer-based education system. He was a lead programmer for Lotus Symphony before co-founding his own company, Iris Associates, which created Lotus Notes. Later, Ray co-founded Groove Networks, which was purchased by Microsoft in 2005, where he followed Bill Gates as Chief Software Architect. Today, he is working on a new stealth startup, Talko. He established the Ray Ozzie Fellowship in 1996 to support CS @ ILLINOIS graduate students. He received an honorary doctor of engineering degree from the University of Illinois in 2012.

Support CS Students

Many of these awards and scholarships are made possible by generous donations from alumni and corporate partners. If you would like to establish a scholarship or sponsor an award, please contact Director of Advancement Michelle Wellens at mwellens@illinois.edu for more information. Gifts are always welcome to support the CS Engineering Visionary Scholarship Fund, which helps us give more and larger scholarships to deserving students. To give online, visit http://cs.illinois.edu/giving/give-now

Ram Gudavalli and the Impact of Scholarships

BY TOM MOONE

Ram Gudavalli (BS ECE '00) is someone who knows firsthand the impact that scholarships can have on a student. Scholarships proved important during his own education. "Illinois gave me different opportunities for scholarships," he said. "Those helped me out quite a bit from a financial perspective."

Following his graduation in 2000, Gudavalli moved to San Francisco to work at a web consulting company. Over the following years, he went to a series of other

> **I got a great education at Illinois. I wanted to start to understand philanthropy and how I could support the school while I was younger.**

companies and startups, moving as he did so more and more into the gaming field. It culminated in his co-founding Funzio, a game development company, in 2010. The company quickly grew to 125 employees and was acquired by GREE International in 2012. Gudavalli now serves as vice president of engineering in GREE's U.S. gaming division.

At GREE, Gudavalli said, "I oversee the engineering development process and manage the engineering teams not only in the creation of games, but also the middle ware services that are needed to support the games and the data analytics platforms that are used to mine the information of team performance and player insights."

Gudavalli enjoys the gaming industry. "The technical challenges are really interesting," he said. "A lot of the time, gaming can be a lot of more forward

looking. These types of applications push the envelope for the devices and the computers that are available, both on the client side and the server side."

Now Gudavalli sees the opportunity for him to give back to the university and help provide scholarships to future Illinois students. "I got a great education at Illinois," he said. "I wanted to start to understand philanthropy and how I could support the school while I was younger."

So he was quite excited to be able to contribute to the new Engineering Visionary Scholarship campaign in the College of Engineering. "Ram's gift was special," said Michelle Wellens, Director for Advancement for CS. "It enabled ECE and CS to establish department-level funds for the scholarship initiative, and we believe that Ram's generosity will inspire his fellow alumni to support student scholarships, too."

Though an ECE graduate, Gudavalli contributed to CS because throughout his educational and business career he was interested in both aspects of computing. "I felt that the education I wanted to get spanned the hardware side of the fence and the software side of the fence," he said. "I feel that this continues even today. I see a lot very interesting things happening in computing that draw upon new hardware innovations in a software world that's more connected."

For more information on how you can support current students, contact Michelle Wellens at mwellens@illinois.edu. You can give online to the CS @ ILLINOIS Engineering Visionary Scholarship fund at http://cs.illinois.edu/giving/give-now

the #lastword
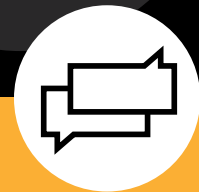
CS @ ILLINOIS is using its social networks to enhance its connection to students, faculty and alumni. Are YOU **Linked, Liking, and Following?** Here are some excerpts of notable posts:

University of Illinois Computer Science

Marc Andreessen provided some insight into the founding of Netscape in some recent Twitter posts.

Champaign-Urbana named one of "Techie.com's Most Promising Tech Hubs to Watch in 2014."

Congratulations to CS student Eric Rosen and the other members of the Illini Chess Club who placed third at the 2013 Pan-American Championship. One of Eric's games was featured in a chess story in the New York Times.

20 years ago, the Mosaic browser developed at Illinois by CS alumni Marc Andreessen and Eric Bina was mentioned for the first time in the New York Times. [December 6, 2013]

@IllinoisCS

An NSF grant will help CS Prof. Roy Campbell and others to train Illinois students in cyber security.

Congrats to Adrenaline Mobility, the startup by CS Prof. Sam King, on the launch of Keys for Android!

Co-founded by Illinois alumni Roshan Choxi and Dave Paola, Bloc provides a 12-week apprenticeship to teach coding.

New CS faculty member Aditya Parameswaran has developed a search engine using crowdsourcing.

CS @ ILLINOIS

CS alumna Linda Mills (MS CS '73) made the Fortune's list of the "50 Most Powerful Women in Business." She is Corporate Vice President of Operations at Northrop Grumman.

CS alumnus Jeff Holden (BS CS '91, MCS '92) was featured as one of Crain's Tech 50 by Crain's Chicago Business.

CS Professor Lawrence Angrave has designed the first MOOC on creating apps for the Android platform.

Vilas Dhar (BS CS '04) was profiled in Forbes for his socially conscious law firm and the launch of his nonprofit incubator, the Next Mile Project.

Department of Computer Science
College of Engineering, College of Liberal Arts & Sciences
University of Illinois at Urbana-Champaign
Thomas M. Siebel Center for Computer Science
201 N. Goodwin Avenue
Urbana, IL 61801

COMPUTER SCIENCE | SIEBEL CENTER

50 10

1964–2014 | 2004–2014

CS @ ILLINOIS

CS @ ILLINOIS will celebrate two major milestones this year—the 50th anniversary of Computer Science as a University department, and the 10th anniversary of our home: the Thomas M. Siebel Center for Computer Science.

We invite you to join us on campus this year to reminisce and rekindle old acquaintances, and to meet our new faculty and current students.

For complete event information, please visit
go.cs.illinois.edu/50_10

cs.illinois.edu