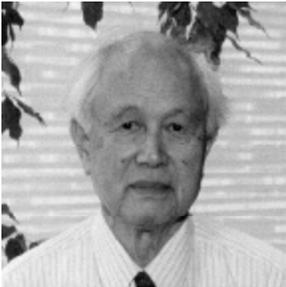# DEPARTMENT OF COMPUTER SCIENCE

The end of an era: Prof. Saburo Muroga retires

Saburo Muroga

Saburo Muroga grew up in Namazu, Japan, the son of a career military officer. As a teenager who played the violin, he aspired to be a diplomat, a fiction writer, or a musician. What he became was a giant in the field of logic design.

He earned his under-graduate degree in electrical engineering from University of Tokyo during the turbulent days right after World War II. He graduated in 1947 with the desire to do research.

Jobs were extremely scarce, and Muroga was lucky to land a job in a small laboratory owned by an enormous government-supported national railroad, which used to test electrical instruments. "Every strange character in the company, which employed about 442,000, was gathered there," he laughingly recalled. "People who had difficulty with others were sent there." When he joined the laboratory, it was converted into a research laboratory devoted to bullet train technology, and many of the researchers had come from the country's top naval and army research labs, which were being dissolved. "At that time," he said, "people at Bell Labs had published a book on visible speech, analyzed by electrical signals. The book was a compilation of research, and I thought this could be used to develop a speech typewriter." He applied for a patent and began basic research on voice recognition. Due to lack of support, he was forced to give up work on the project.

Muroga's manager left the company to join a government agency similar to the American F.C.C., and Muroga followed him there. "But it was a miserable place," he said. "We had to make laws and prepare data

Retires after 32 years

Zigrida Arbatsky has seen a lot of changes since her arrival in CS in 1970 as Professor Muroga's secretary. This was before the arrival of the personal computer; she typed manuscripts and student's theses, including that of Professor David Padua. A terminal hooked to the mainframe computer was soon to appear on her desk and with it's arrival she learned Troff, LaTeX, ED, EX, and Unix. Later when the department switched to PCs, she switched to the latest software evolving as it did. She still maintains her pre-PC skills as various professors still use the "classics."

She also helped Prof. Muroga with the department's library. For students the library was a great place to study and had the best source of CS books, journals, and technical reports not available

Zigrida Arbatsky

Thank you, Judy!

After nine years of dedicated service to the department, alumni, and students, Judy Tolliver has taken a new position as Program Manager with the National Center for Supercomputing Applications. She became the conduit between the three groups, connecting people, creating the highly successful Mentor Program, and being a valuable resource. And there was Cyberfest!

While Tolliver was here, the department has received a 56 percent increase in annual fund gifts—a tremendous sign of your support. The department's endowment has grown from $351,000 to more than $8 M, and its first endowed positions were established with gifts by private individuals: three scholarships, four fellowships, two professorships, and two chairs. And in 2001, we received a $32 M gift for a new building.

Judy Tolliver

Dear Alumni and Friends,

Working to raise money for the Department of Computer Science has been the best job I've ever had. Over the nine years that I've been coordinator of alumni relations and development, I've met many wonderful people who share a common interest—to provide the best educational experience for the next generation of students. Alumni and friends across the country have expressed their loyalty, commitment, and generosity to the department by openly sharing their personal experiences at the university and offering their opinions about our programs, as well as their thoughts on how we can improve.

I sincerely thank all of you who have made contributions to the department, financially and in other ways. Your support is vital to the faculty and students who currently walk the halls of DCL and who will occupy our new building, Siebel Center. I especially thank those of you who have started new traditions by endowing funds to ensure that we thrive for generations to come.

It has been a privilege to work for the best computer science department in the world, and although I'm moving on as a program director for NCSA, I am happy knowing that many of our paths will cross again.

Again, thank you.

Sincerely,
Judy Tolliver

Judy Tolliver with Doug Hilmes, BS 85, and Prof. Roy Campbell during Illini Reception (1995).

Zigrida, continued from page 1
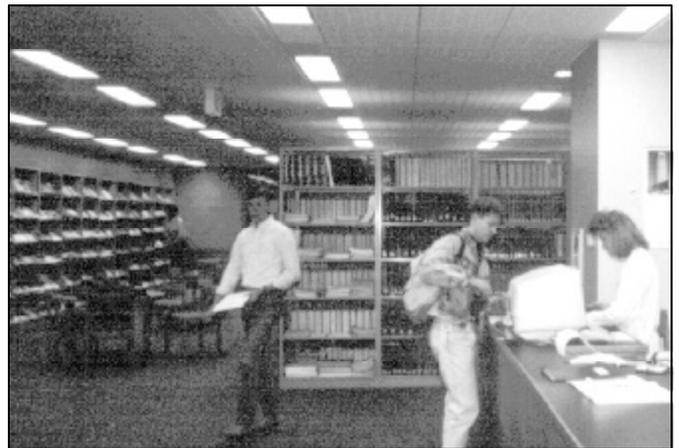
Zigrida Arbatsky

anywhere else on campus. Zigrida said that on a number of occasions she found signs of after hours partying.

During the mid-1980s, the depart-ment library became part of the university library system. She had to renumber and reorder the entire collection. In 1990 when the latest addition to DCL was opened, she helped move the collection to its new home. Her happiest memories are of working with students and helping them locate material. They in turn brought her many books, including science fiction, books by Stephen King and the Lord of the Rings series, to "lighten" her reading. She recollects that her saddest day was in 1996 when the collection was moved to the Grainger Library. "Everyone, especially faculty, enjoyed having materials close at hand," said Zigrida.

"Zigrida was easy to work with. I learned a lot from her and she was a good source of information for the department. She had a great historical memory and of course she knew exactly what was going on in the department," according to Rick Henderson, DCL building supervisor.

She plans to continue skiing, which she began when she moved here in 1965. Last year she went with the Ski Club to the French Alps, and one of her favorite places is Jackson Hole, Wyoming. "Exercise makes me feel good," she commented.

She is moving to New York in July to be near her son. She will not stray too far from computers because she will bring a recently acquired laptop computer with her. But first, she said, she must learn how to use it.

DCS Library (1990)

From the corner office . . .

Marc Snir

A year has quickly passed since I started as department head. The summer is here; time to slow down a little and to reflect on what was achieved this year and where we go from here.

We have had an exceptional recruiting season this spring, with a large number of top candidates interested in our department. Eight outstanding new faculty members will join us this fall (see p. 11). They will strengthen our department in established research area and push us into new areas such as information retrieval and human computer interfaces. Many of the candidates that turned us down did so because of the lack of a suitable position for the candidate's spouse. This is a serious problem for a small place, as two career couples become the norm. The university has programs in place to help with spousal hiring, but we must do more and learn from the private sector how to handle this issue using job placement services or other mechanisms.

Hiring is likely to be more modest next year because of reduced budgets. The University faces a $40 million reduction in the state budget, which will be partly offset by a 10% tuition increase. Academic units have seen their budgets decrease by an average of 6%. Lower cuts have been applied to units like ours "where priorities of research excellence and major instructional responsibilities intersect…" However, tight budgets are likely to be with us for the next few years, and the long-term trend of continued reductions in state support is unlikely to be reversed.

This shortfall has been compensated by an increase in alternative sources of funding: federal and industrial research funding, tuition, and gifts. I expect this trend to continue. A virtuous cycle is at work: our commitment to excellence enables us to receive funding that supports our commitment to excellence.

We are doing very well with federal research funding – last year has seen a marked increase in our income from such funds. While many of our faculty members have fruitful collaborations with industry, I believe that with your help we can do better in attracting industrial funding. Collaborations are important not only because of the potential revenue; but they also ensure that our research stays relevant and that we deal with real problems and provide practical solutions.

Although tuition has increased, our education is still a good bargain. There are sound social and economic reasons to make high quality education widely available and affordable, and I wish we could avoid the current inflation in the cost of education. Unfortunately, this is a broad policy issue over which we have little control.

Our distance learning program continues to be quite successful and provides us with a modest, but steady, income. The support of our alumni and friends continues to be essential in maintaining our excellence (see p.7).

The recent rankings from *US News and World Report* have brought us good news: we were ranked (again) fifth in the country along with the College of Engineering. Our peers continue to recognize the high quality of our programs. I always take such rankings with a grain of salt because of the many biases that are built into them. However, there are some useful lessons to be learned.

The first lesson is that size matters: there is a clear correlation between size and rank. The department plans to continue growing to more than sixty faculty members. This growth will improve our education with smaller student/faculty ratios and improve our research with critical mass in all key research areas.

Another lesson is that leveraging computer science research and education activities across the campus is essential. Computer Science at the UI is excellent not only because we have an excellent department, but we also have great CS-related research and education in other units: first and foremost is ECE, but also in Library and Information Sciences or Commerce and Business Administration.

Similarly the relationship between academic departments and research centers must also be nurtured. The research centers, such as the CSL, Beckman, or NCSA, fulfill an important role at the university in supporting interdisciplinary and applied research. Such centers promote research excellence but they have no educational mission and do not contribute directly to the disciplinary strength of the departments. There is the risk of an increased separation between the research mission of the university, which is the focus of the research centers, and the educational mission of the university, which is the focus of the academic departments. I believe that a stronger interaction between academic departments and research centers will benefit both.

I plan to spend significant time next year on improving our interactions with other departments and research centers. I expect that I shall spend much time on the Siebel Center, as we are approaching the "climax" of its opening in Fall 03. We are committed to making this center a unique environment for IT research and education – with up-to-date pervasive computing technology and with heavy involvement of students, faculty, and staff in ensuring that this technology becomes fully integrated in the daily texture of our life.

I hope for and expect your help on many of these endeavors. I look forward to meeting many of you during my trips, at alumni gatherings, or when you visit the campus. I shall have the opportunity to interact more closely with those of you who serve on our advisory council. I would like to hear your opinions and get your help in setting future directions for the department; improving our education and better preparing our students for their future careers; improving our interaction with industry; ensuring that the Siebel Center will provide a unique experience to our students; and finally, ensuring that our department will continue and improve on its proud tradition of excellence.

— Marc Snir

Academy Award winner speaks on computer vision

Steve Sullivan

Steve Sullivan, PhD 96 in ECE, was on campus in April to give a Distinguished Lecture entitled "Computer Vision and the Art of Special Effects." His talk focused on how computer vision techniques are impacting production of feature films such as "Star Wars," "Pearl Harbor," A.I.," and most recently "Minority Report." While a student here at U of I, he studied under CS Prof. Jean Ponce, focusing on automatic object modeling, recognition, and surface representations.

In 2002, he received an Academy Award for Technical Achievement for his team's first project, the ILM Motion and Structure Recovery System (MARS). The system uses sophisticated algorithms and user-interface tools to provide analysis of the motion of the camera and the motion and dimensions of the object in a scene.

Computer vision is the process of recognizing and interpreting objects through the analysis of their images. Sullivan and his computer vision team of five focus on interpreting objects and getting the most information out of their images. Instead of using elaborate models, the team finds better ways to achieve the same effect by building virtual models that are inserted into the scene. They figure out the angles of the shot, make changes in lighting so the model looks natural within the frame, and also keep track of other objects within the scene. They also work with motion capture using the performance of someone as a basis for their graphics character. This process adds finer detail, and the graphics character appears more realistic in the film.

With each film the process becomes better. "In some ways its bad because people sort of believe now that you can just do anything. The shock value is gone," says Sullivan with a laugh. "They won't go see a movie just because of the effects. We now have to work harder and have different criteria. There is some interesting stuff in 'Minority Report.' It's not a featured piece of the film, but it was interesting from our standpoint and sort of a new look. There are some potentially big, groundbreaking things coming up in the future I can't talk about. Some movies we are just trying to improve the process and in others we are trying to do some very central thing."

So how did he become interested in computer vision? He had a few really good teachers in junior high who were excited about computers and brought their own PCs into school. They encouraged interested students to play around with them. He was immediately attracted to the graphics and the programming behind them. He received his first computer in 1981, a TRS 80 color computer. "Computers back then were far more accessible to someone. You walk up, turn it on, it's immediately there and you can start programming right away," commented Sullivan. He later bought a working TRS 80 at a garage sale.

He never studied graphics in the art sense and but was a TA for a CS graphics class. He and his group use science and technology, not pen and ink, to produce their rendered images. For example, they used vision algorithms to generate the Hall of Containment prisoners in "Minority Report."

Nearing the end of his thesis work, he was still undecided about what type of job to look for. He was watching a documentary on how they created the scenes in "Jurassic Park." Sullivan recognized that they could be using computer vision instead of manually doing the effects. He approached Industrial Light and Magic (ILM) with his ideas. They were interested but said that they could achieve their end goals with their present techniques; using 20 people to manually create the images. He then approached Rhythm and Hues Studios, which had just won a special effects Academy Award for "Babe," and they were very excited about his ideas. He worked there for two years developing 3D animation and tracking software. In 1998 he was recruited by ILM and would later work on "Jurassic Park III" using his computer vision technology.

He and Prof. Ponce are interested in a collaboration that would be mutually beneficial. ILM would supply the real-world problems or interesting topics for research that come up during their projects and Ponce's group would work on the theory and robust solutions. Sullivan said that their group does not have the time to develop long-term solutions to their problems but find problem-specific solutions.

Sullivan commented that since winning the Academy Award he has more freedom and greater input on which problems need to be worked on. It is difficult to "convince people who have no technical backgrounds that it is worth the risk on their very expensive high-profile movie on your technology," he said. "A lot of the work we see now is more about making something appear real than appear spectacular or unreal. The next big frontier that everyone is waiting for is digital."

His advice to students is to take as much math as possible. He wishes he had taken more. He can teach new staff the details, but they need a solid base of theory to draw from when working in this area. He said he was very pleased that the graphics group is growing and that it is a critical component to the work being done in many areas of industry.

Classnotes

2000s

Richard Bernotas, BS 01, was married to Emily Smith last October. He is employed by Strata Design Technologies in Champaign as a software designer.

Brian Bohl, BS 00, was married last September to Kym McCarty. He is employed at Unified Development, Inc., in St. Louis as a systems consultant.

1990s

Adam Boyko, BS 99, was married last October to Kelly Kieft. He is pursuing a PhD in biology at Purdue University.

Stuart Kienlen, BS 99, married Laurie Thacker last February. He is a computer analyst with Southwestern Bell in St. Louis, Mo.

David Wellinghoff, BS 97, has been working at Intel for five years as a software engineer designing microprocessors. He recently moved to the broadband products group and is designing applications and drivers for DSL modems

Earl Bonovich, BS 96, and his wife Anne (Estandarte) Bonovich, BS Geology 96, had a baby boy in July 2001. They live in Orland Park, Ill.

Chad Phillips, BS 95, married Jane Geier last November. He is employed by CommWorks, a 3Com Company in Rolling Meadows, Ill.

Theron Tock, MS 94, is founder and CTO of Neoteris. Before that, he was chief engineer with WebMD, and before that he held positions at Sun, MITRE, and Boeing. Neoteris produces instant virtual extranet products.

Kevin Wiggen, BS 94, is chairman of Xythos, a company he cofounded in 1999. Xythos develops standards-based file access, sharing, and management software. Before that, he was with Oracle and founded its application's Internet product group.

Kris Powers, PhD 93, is now assistant professor at Berry College, Mount Berry, Ga. She had been at UI Springfield.

Scott Corley, BS 92, and his wife Melissa welcomed their new daughter Catie Clare Corley in December 2001. Catie is now famous worldwide, because her picture is being used in promotional screen shots of his latest product, AcidImage. You can see AcidImage, and Catie, at http://www.red-mercury.com.

Kelvin Sung, PhD 92, is an associate professor in the Department of Computing and Software Systems at University of Washington at Botham.

1980s

Kevin McFall, BS 89, completed a MBA from the John Sperling School of Business at the University of Phoenix in March. He is currently director of enterprise application development for the Tribune Company's Media Services group and an events correspondent for the Tribune's BlackVoices.com.

Kent Steffen, BS 89, is president and CEO of Telution, a company he cofounded in 1998 after ten years with Andersen Consulting. Telution provides software for communications companies and is based in Chicago.

Steven Ashby, MS 85, PhD 88, has been named deputy associate director for computing applications and research at Lawrence Livermore National Laboratory. He is responsible for overseeing R&D activities of nearly 500 computer scientists and mathematicians working on a variety of applications in the defense, energy, and life sciences. He lives in Livermore with his wife, Maria Elizabeth Ong, and their two children, Hunter and Hannah.

Wu-Tung Cheng, PhD 85, was named a Fellow by the IEEE for his outstanding contributions to design-for-test (DFT) methodologies for system-on-chip designs. He is currently chief scientist and unit manager for Mentor Graphics Corporation's DFT Division.

Thomas M. Siebel, MS 85, was presented with the UI Presidential Award and Medallion in recognition of his "commitment to excellence in software engineering, computer science research, and graduate education and to his continuing commitment and generosity to his alma mater." He received the award during the fall meeting of the Silicon Valley Roundtable.

Marc Gallo, BS 83, serves as vice president, Global Digital Strategy and Development Practice at Unisys. He is working with clients to bring their businesses to a collaborative-commerce model using e-business strategy and design services. Previously he was CEO of Sierra Atlantic and a lead consulting partner at Pricewaterhouse Coopers.

Mark Tebbe, BS 83, stepped down in January as chairman of Lante, the Chicago-based consulting firm he founded, but will remain with the company.

Mark Mahowald, BS 81, is VP, multicast and networking technologies, for Talarian. Before that, he was president and CEO of WhiteBarn, a software

development and networking company that was acquired by Talarian. He has held senior management positions at Lachman Technology Group, Rich Inc., and Reuters. He was also a member of the technical staff at Bell Labs.

Jeffrey A. Miller, BS 78, is VP of development for PCTEL, a provider of soft modems and Internet access technology, based in Milpitas, Calif. He led SAFCO Technologies's test and measurement group for three years before its acquisition by Agilent. Before that, he was with Motorola.

1970s

Michael Borman, BS 77, is president and COO for Blue Martini Software, an eCRM provider based in San Mateo, Calif. He assumed this position in October 2001 after a long career at IBM, most recently as VP for worldwide Unix sales.

Daniel Pitt, MS 73, PhD 79, will become the dean of the engineering school at Santa Clara University beginning this July. He was formerly a VP with Nortel Networks.

1960s

Tomlinson Holman, BS Communications 68, won a Tech Oscar for 2001 for "research and systems integration resulting in the improvement of motion picture loudspeaker systems. For over 20 years, Tomlinson Holman has been involved in the research and integration of the constant-directivity, direct radiator bass type of cinema loudspeaker systems." Holman, known as the creator of the THX sound system, gave a talk in CS in 1998.

Traps to avoid

Max Levchin

Max Levchin, BS 97, cofounder and CTO of PayPal Inc., gave the department's Distinguished Entrepreneur Lecture in April entitled "Why So Many Cool Tech Companies Fail: Ten Traps to Avoid When Taking a Neat Idea to Market."

Levchin gave reasons for many tech company failures, identified traps to avoid when growing a tech company, and explained how PayPal learned from early mistakes, overcame missteps, and avoided big pitfalls to become one of the few successful IPOs of 2002. All of our Entrepreneur lectures are archived on our Web site.

He was recently selected as one world's top 100 innovators under age 35 by "Technology Review." EBay announced that it would buy PayPal in a stock swap worth $1.5 billion.

In Memoriam

John Mullen, BS 73, died at his home in San Jose, Calif. last June. After graduation, John worked CAC and then attended graduate school at UIUC. After leaving Champaign, he worked in the areas of network protocols and high-speed communication at Communication Machinery Corporation, Hitachi, and 3Com. Contributions may be made to the American Heart Association.

Matthew Sinise, BS 00, died in April. He graduated with honors and had been an employee of Bridge Transaction Services in Creve Coeur, Mo., and of Reuters. Memorials may be made to St. Timothy's Episcopal Church in Creve Coeur.

241 new alums

Campus was a buzz with graduates and their family and friends attending the 131st commencement ceremony held May 12 at the Assembly Hall. Altogether there were 241 CS graduates: 175 bachelor's degrees, 59 master's degrees (including 15 from the Internet program), and seven PhDs.

As those new alums are walking out our doors to begin their next endeavor, new students will be arriving this fall to begin the cycle over again. There will be about 280 freshman and transfer students and 120 graduate students this fall.

Fall alum events

The department will be co-hosting receptions this fall for area alums at Motorola in Schaumberg, Ill. and IBM in Yorktown Heights, N.Y. Department representatives will give updates on CS news and happenings. Invitations will be going out this fall.

October 14, IBM
TBA (October/November), Motorola

Mark your calendars for upcoming on-campus fall events:
October 18-20, ACM Reflections/ Projections 2002
October 26, Homecoming (Illinois vs. Indiana)

UNIVERSITY OF ILLINOIS
HOMECOMING 2002
OCTOBER 20-27

Thank you!

The following graduates and friends of the department have made generous gifts and donations during the period September 1, 2000 to July 13, 2002.

Dean's Club ($500 or more)

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Channing B. Brown III*
Debra Jo and Ira R. Cohen*
Ronald L. and Elena S. Danielson
Ross M. Erlebacher and Susan B. Silver
Michael and Lia Faiman*
Scott H. Fisher
Marc A. Gallo
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Barbera E. and James M. Stern
John R. and Martha N. Thompson
Kai-Wen and Carolyn M. Tu

Innovation Fund established

The Computer Science Innovation Fund was recently established by Matt Markus, BS 97, and Ramesh Haridas, BS 96. Each made cash contributions independently and at practically the same time. It is quite a coincidence because the two happened to have been in business together, as founders of PrivacyBank.com, now part of InfoSpace. We are heartened and encouraged that our alumni are as enthusiastic about our new building as we are.

The Computer Science Innovation Fund was established to insure that the Siebel Center will be more than a structure to house people and things. It will be a dynamic environment offering the very best computing and educational resources available. The fund will go toward its infrastructure, hardware, software, support, and all the vital components necessary to propel us through the future.

Please join us, Matt Markus, Ramesh Haridas, and others who are committed to computer science education at the U of I, in supporting this monumental endeavor. Contact us at alumni@cs.uiuc.edu, or fill out the form on the back of this newsletter, with your gift, to make an immediate contribution.

2001– 2002 Awards

Student Awards

Sohaib and Sara Abbasi Fellowship: **Mumtaz Ahmad**

Bronze Tablet: **Michael D. Bond, Joanna M. Francis, Neal K. Groothuis, Mark A. Miller, Jeffrey A. Stoller,** and **David L. Zanter**

Roy J. Carver Fellowships: **Lee Baugh, Kirill Mechitov, Jason O'Kane, Donald Schmidt,** and **Sameer Sundresh**

Sara & Louis Cohen Scholarship: **Alan Perez-Rathke**

Crow, Chizek & Co. LLP Outstanding Student Scholarship: **John Thomas Piller**

John Deere Scholarship: **Mary E. Pacold**

Dunn Systems Scholarships: **Michael A. Munie** and **Nicole J. Pakiz**

Henry Ford II Scholar Award: **Svetlana Lazebnik**

4.0 Senior: **Michael A. Gorczowski**

C.W. Gear Award — Outstanding Graduate Award: **Xue Liu**

Outstanding Undergraduate Award: **Joseph M. Kelley**

Graduate College Fellowship for Underrepresented Minority Students: **Kenton McHenry**

Franz Hohn & J.P. Nash Scholarships: **Matthew Ahrens** and **Hormozd Gahvari**

Michael Hughes Software Engineering Awards: **Alan Bailey, Freidrich Carillo, Joshua M. Michaels, Charlie Pikscher, Paul Stankus, Edmund White,** and **Sean Liu Xu**

ILLIAC Fellowships: **Lee Baugh, Kirill Mechitov,** and **Jungmin So**

Illinois Distinguished Fellowship: **Jungmin So**

Knights of St. Pat: **Irene Fusman** and **Nicole J. Pakiz**

David J. Kuck Outstanding Thesis Awards: **Vanish Talwar** (MS) and **Xiangmin M. Jiao** (PhD)

Duncan H. Lawrie Award: **Irene Fusman**

C. L. & Jane W-S. Liu Award: **Svetlana Lazebnik**

Joshua Michaels
Hughes Award

Nicole Pakiz with Bill Dunn
Dunn Scholarship

Mary Pacold
Deere & Spyglass Scholarships

Mavis Memorial Fund Scholarship: **Kai Chen**

Outstanding Teaching Assistant: **Anthony Hursh**

John R. Pasta Awards: **Benjamin A. Miller** and **Joseph L. Orndorff**

W. J. Poppelbaum Memorial Award: **Christopher J. Hughes**

Siebel Scholars: **Bhaskar Borthakur, Albert Chu, Hui Fang, James W. Jackson,** and **Ryan Szypowski**

Daniel L. Slotnick Award: **John Lloyd Wright**

James N. Snyder Awards: **Matt W. Hansen** and **Geoffrey Levine**

Spyglass Scholarships: **Mary E. Pacold, Jessica Schoen, Gergana S. Slavova, Qihua (Lily) Yang,** and **Kelly W. Yeh**

SURGE Fellowships: **Naomi Caldwell** and **Kenton McHenry**

Verizon Fellowship: **Can Zheng**

William & Ruth Witt Scholarship: **Martha N. Teklu**

Warren William Young Award: **Shawn T. Lindberg**

James Jackson
Siebel Scholar

Martha Teklu
Witt Scholarship

Jungmin So
ILLIAC Fellowship

Faculty and Staff Awards

Department Staff Awards: **Barbara Armstrong** and **Chuck Thompson**

C. W. Gear Award for Faculty: **Vikram Adve**

Chancellor's Distinguished Staff (Finalist): **Barb Cicone**

Campus Award for Excellence in Guiding Under-graduate Research (Honorable Mention): **Dan Roth**

Four receive Willets

Professors Jeff Erickson, David Kriegman, Dan Roth, and Josep Torrellas were chosen by the College of Engineering to received a Willett Faculty Scholar Award. The award is for faculty members who are in a relatively early stages of their careers and are excelling in their contributions to the university. Each will receive money that can be used to help support their research for at least the next three years. In addition, they will each receive a salary supplement of $2,000 per year. Twenty awards were given to college faculty members for the first time this year.

Ong wins alumni honors

Peng T. Ong, MS 88, received the College of Engineering's Alumni Award for Distinguished Service at their convocation held in April. He received the award for his vision and leadership in building Interwoven into the world's leading provider of enterprise-class content infrastructure software. He is founder of the company, which he started in 1995 and took public in 1999.

After successfully launching Interwoven's TeamSite, he stepped down as CEO, served as chairman of the board until January 2002, and is now chairman emeritus. When he finds the time, Ong is an angel investor in new enterprises. His advice is sought by many aspiring technology entrepreneurs. He currently splits his time between Asia and the United States to help nurture technology start-ups and to foster collaborative business opportunities between the two regions. He is also working on his next company.

A previous article on Peng Ong appeared in the winter 1999 issue. It is also available at: www.cs.uiuc.edu/news/alumni/w99/ong.html.

Pair receive major campus awards

Mike Heath

Professor Michael Heath was presented with the Campus Award for Excellence in Graduate and Professional Teaching. He was nominated for the commitment to education and enthusiasm that he carries with him throughout his day. Prof. Heath teaches classes in numerical analysis, a rather unexciting subject for many, but for his students he brings a dry sense of humor and the ability to explain difficult material in an understandable way. His expectations of himself and his students are very high. He is always prepared and undertakes his teaching responsibilities seriously. His students remarked that he has an animated and lively lecture style, is an excellent speaker, and highly motivating. His commitment to education extends beyond the classroom to his roles as a graduate research mentor, as an author, as the director of the Computational Science and Engineering program, and as the director of the Center for Simulation of Advanced Rockets.

Jason Zych

Jason Zych, lecturer in computer science, received the 2002 Campus Award for Excellence in Undergraduate Teaching for his dedication, empathy, talented teaching and development and revision of course materials. Zych has received numerous department and college awards. He has been named to the *Incomplete List of Teachers Rated Excellent by their Students*. Students have commented that he encourages them to make connections between the class material and their work experiences; his lectures are quick, clear, and to the point; he has the ability through his questions to lead students to discover answers; and he regularly uses real-world problems as part of his materials. Zych consistently incorporates the latest in teaching technologies to his lectures, experimenting and redefining them to fit his purpose and to enhance the student experience.

Faculty notes

Kevin C. Chang, Sariel Har-Peled, and Yizhou Yu received NSF CAREER Awards designed to recognize the most outstanding and promising young scientists and engineers.

John Hart became editor-in-chief of *ACM Transactions of Computer Graphics*. He is also editor-in-chief of *ACM Computing Surveys*.

Dan Reed gave the NSF CISE distinguished lecture, "Advanced Computational Infrastructure and Research Computing Infrastructure for the 21st Century: Time to Go Long and Go Deep."

Dan Roth was made a Fellow at the UI Center of Advanced Studies.

Josep Torrellas received the Best Paper Award in the Fifth Workshop on Multithreaded Execution, Architecture, and Compilation, December 2001, for the paper "Prefetching in an Intelligent Memory Architecture Using a Helper Thread" coauthored by Y. Solihin and J. Lee. He was also reappointed as Vice-Chairman of the Institute of Electrical and Electronics Engineers (IEEE) Technical Committee on Computer Architecture (TCCA), where he is also a member of its Advisory Board.

CS website's designer pens new book

The new CS website, www.cs.uiuc.edu, owes its look and feel to designer Luke Wroblewski, BFA Graphic Design 98, BFA Art History 99, MFA Interface Design.

CS website design

Wroblewski heads interface and new media design in NCSA's communications group as well as runs his own company, LukeW Interface Designs (lukew.com). He can now add "Author" to his business card. His book, *Site-Seeing: A Visual Approach to Web Usability* (John Wiley & Sons, 2002), is now available nationwide. Unlike most books about Web usability, it emphasizes the visual communication techniques that contribute to Web usability, including visual organization principles, and creating a unified look and feel or personality for a website. CS alums will recognize some of the screenshots used as examples in the book, from the CS website.

DCL historical marker

ILLIAC Marker

"Early Computers

Combining the administrative and computer experience of Louis N. Ridenour, the mathematical ability of Abraham H. Taub, and the electrical engineering background of Ralph E. Meagher, in 1952 the Digital Computer Laboratory developed ILLIAC I. The first digital computer built and owned entirely by an educational institution. It weighed five tons and contained 2,800 vacuum tubes. The ILLIAC series continued with ILLIAC II, a transistorized computer, and culminated in the mid-1960s with the ILLIAC IV supercomputer, the largest and fastest in the world."

The marker is located at the west doors of DCL. The 57 bronze markers, each weighing 75 pounds and mounted on an 8-foot pole sunk several feet into concrete, have been appearing throughout campus since last summer. These initial markers honor faculty members for whom buildings are named and others whose achievements have changed their discipline.

Security Center launched

In February 2001, the Center for Advanced Research in Information Security (CARIS) was formed in the Department of Computer Science and is headed by Professor Roy Campbell. Already designated by the NSA as a Center of Excellence in Information Assurance, the department will team up with Savoy-based Argus Systems Group, a producer of Internet security applications best known for its PitBull software. The focus of the interdisciplinary center's research will be on next generation infrastructure security technologies.

Initial research efforts will focus on operating system security, wireless security, and products relating to PKI and Smart Card systems. CARIS will operate on existing funding for security research and bootstrap itself from there. It is hoped that working with the private sector will enable faster transition of products from the research lab to the market. Said Campbell, "CARIS is a locus for people to get together and discuss how to approach security. The government's producing a lot of different programs in security and usually the funding is in specific areas and attached to trying to develop research to the point where it's actually transferred into industry. By having a center, we can affect that."

For more information see www.caris.uiuc.edu.

New faculty for fall

Eight new faculty members will join the department this fall, bringing the total number to 43; 14 professors, 11 associates, and 18 assistants. Their research areas include real-time, OS and storage, and formal methods and new areas including information retrieval and human computer interfaces.

Brian P. Bailey, assistant professor, received his PhD from University of Minnesota in 2002. His research is in the areas of multimedia design tools, authoring, systems; user interface design, human-computer interaction; ubiquitous computing, social interfaces, and application of Internet technology. He developed DEMAIS, a multimedia design tool, that enables a designer to rapidly sketch behavioral design ideas and then transform them into a working example for clients and team members.

Brian Bailey

Marco Caccamo, assistant professor, received his PhD in 1998 from Scuola Superiore S. Anna in Pisa, Italy. Since his graduation, he worked for Retis Lab at his alma mater and has been a visiting scholar at CS several times. His major research areas are in real-time and embedded systems, dynamic scheduling, and real-time support for multimedia. He has been working with Lui Sha on a project focusing on wireless sensor networking.

Marco Caccomo

AnHai Doan, assistant professor, received his PhD from the University of Washington in 2002. His research centers on databases and artificial intelligence, with an emphasis on applying and extending machine learning techniques to address data integration over the Internet and across enterprises. This includes scheme matching, object identification across multiple sources, schema evolution, user interaction, learning with structured data, and text mining.

AnHai Doan

Edgar A. Ramos, assistant professor, received his PhD from UIUC in 1995. He has been a research associate at the Max-Planck-Institute fur Informatic since 1998. His research interests include combinatorial and computational geometry, randomized algorithms

Edgar Ramos

and derandomization, optimization, and approximation algorithms.

Grigore Rosu, assistant professor, received his PhD from University of California at San Diego in 2000. His research interests are in the areas of software: design, semantics and implementation of programming and specification languages; automated software engineering and formal methods; automated reasoning about computer systems, applications of logics, theorem proving; and algorithms, (co)algebra, category theory.

Grigore Rosu

Chengxiang Zhai, assistant professor, received his PhD from Carnegie Mellon University in 2002. His research interests are in developing algorithms for text information management, including retrieval, filtering, classification, summarization, and mining of text. He is also interested in statistical natural language processing and its application in text classification and text mining.

Changxiang Zhai

Yuanyuan Zhou, assistant professor, received her PhD from Princeton University in 2000. She was scientist with NEC Research Institute and is currently director of StorageNetworks, a NEC spin-off. Her research interests include operating systems, file systems, and storage systems, computer architecture, system support for databases, architecture support for systems, distributed systems, and parallel systems.

Yuanyuan Zhou

Craig B. Zillies, assistant professor, received his PhD from University of Wisconsin at Madison in 2002. His research interests include computer architecture, micro-architecture, optimizing compilers, profiling mechanisms, and dynamic optimization systems.

Craig Zilles

e-Fuzion: Reinventing education

Picture yourself in a large classroom where the instructor is lecturing, slides are projected onto a screen, and you are taking copious notes. Sound familiar? How about if the lecturer is adding notes and graphics to the slides as she roams the room holding a wireless tablet? Meanwhile, you are adding your own comments to these annotated slides on your computer to be saved for later. Two undergraduates, David Pan (CS) and Patrick Bristow (ECE), are making this scenario a reality with their e-Fuzion software application.

It all began last fall when the pair were freshmen taking CS 225. They both had come from a South Carolina magnet school where exceptionally small classes were the norm. They wondered how they could make 225 into a small-class experience for students. In September they began developing the application using C++ that would allow the instructor to use custom graphics tools and to cut and paste material from slide to slide, taking less classroom time. By November they had switched to C#, based on Microsoft's .NET initiative, with platform independence in mind.

Meanwhile, CS lecturer Chad Peiper was looking for a better way to communicate and interact with students. He had been using a graphics tablet to allow pen-based, projected drawing. The three joined forces and piloted the software in CS 300 last spring semester and CS 311 this summer. The most notable change in the classroom scenario was offering Peiper the freedom to move about the room using a wireless tablet, allowing him to more directly engage his students.

One of the features of the program allows the teaching assistant (TA) to answer questions posted in the chat space during class. Questions come from students who might be reticent about speaking up in class or who don't want to interrupt the flow with a small question. If a number of students ask the same question, the TA sends a note to the instructor indicating the problem and the lecture flow can be immediately modified to take this into account. Another feature is the ability to poll students during class, which helps the instructor to immediately gauge if the material is hitting the mark.

"Students are more encouraged to participate. The technology helps break the ice because there is already communication going on. With so many learning styles, e-Fuzion allows all students to participate in class, whether it be raising their hand or using the chat space for a question," noted Peiper.

Most applications of this type are aimed at the corporate environment and are too large and complex for the classroom. e-Fuzion, on the other hand, is a streamlined program that has been kept small, simple, and can be scaled to work with an individual, small group, or a class of 200. The power in the program is the
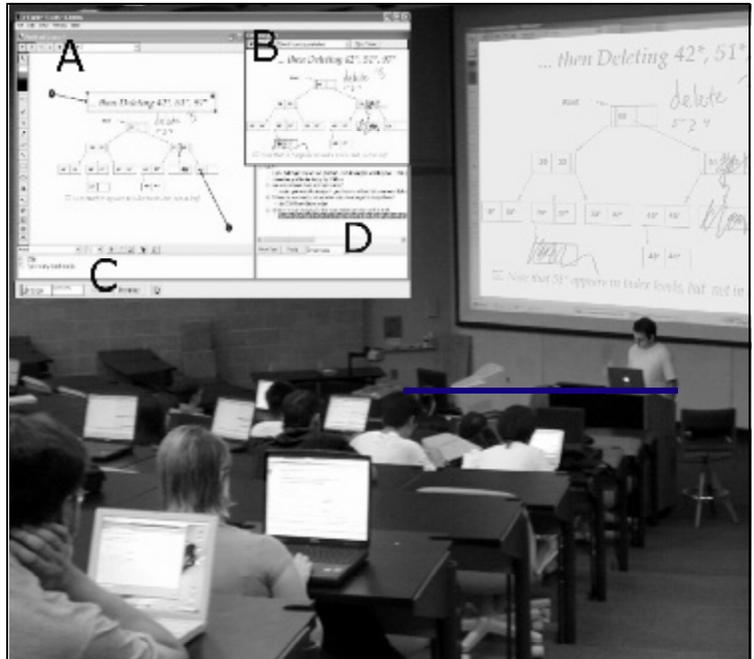
Student's view of e-Fuzion. Areas include: instructor's slides and notes (B), student's clipboard (A), student notes (C), and class chat space (D).

use of vector graphics rather than raster graphics, which has been known to reduce file sizes by as much as 99% from previous semesters which used NetMeeting Whiteboard. The smaller size means quick loading during class and that each student can archive the lecture along with their notes for later reference. Thirty of the students are using pen-based Fujitsu LifeBook computers.

Pan and Bristow are now experimenting with 802.11a wireless networking, which gives them greater bandwidth capability than the 802.11b standard. The trio are also working with NCSA to use the software on the Access Grid, which supports large-scale synchronous distributed training on over 100 nodes worldwide. e-Fuzion will be the first pedagogical technology to ever be cohesively designed and tailored for use on the Access Grid. For more information, see: www.e-fuzion.com.
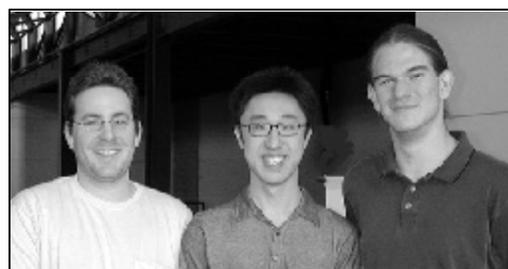
Chad Peiper, David Pan, and Patrick Bristow

Crowds take CS challenge at EOH

The 82nd annual Engineering Open House provided computer science students with an opportunity to showcase projects displaying originality, humor, and high-tech know how. This year's theme, Free Your Mind, encouraged participants to think outside the box. Student projects drew grade, high school and college students as well as visitors from the community and across the state eager to participate in the experience or to view and ask questions about the technology displayed within DCL.

1st Place, Just for Fun Sounds and Visions, blended the best of SIGGraph and SIGMusic through computer-generated animations with original music and sound effects. For one visually stunning entry, "Velouria," the student used subdivision surface modeling and hours of rendering to create a futuristic animated story. The music sets the dark, rich tones of the storyline.

1st Place, Original Undergraduate Research, SIGArt, uses the resources of artificial intelligence to create Semanta, which interacts with users through natural English language, learns from conversations and visual input, and manipulates its environment through a robotic arm.

1st Place, The Programmers Liberation Organization, created Campus Rumble, a video game that presented the classic battle between engineering and liberal arts students. The two groups battled it out on a 3D version of campus.

2nd Place, Free Your Mind MacWarriers' 3DOSX, is a file system browser that utilizes three dimensions to view directory hierarchies. It supports a full range of file system actions, such as copying, creating new folders, and ejecting disks. The group provides a free copy of their browser for downloading from their home page.

Apprentice MacWarrior

3rd Place, Original Undergraduate Research — High Dynamic Range Image Editing/Capture. The dynamic range of an image is the contrast of all represented intensities in an image. The SIGGraph image editor will work with the low dynamic range of the image while preserving the high dynamic range.

How can an engineer learn to dance? The answer could be found at the Digital Dancer exhibit courtesy of SIGArch. Using advanced digital signal processing technology, the Digital Dancer takes arbitrary music and

These feet are made for dancing

creates dance steps for it in real time. Players dance on a stage following the steps and are scored on how well they match the steps and music. The exhibit won the unofficial audience award and was often cited as a favorite.

Visitors could test all their skills first-hand at many of the exhibits. They could play with SIGMobile's LaserBots, which used a PDA with a wireless link to move a robot around an arena and fire on the opponent, or they could use all their gaming skills on the souped-up ACM's Gamecube or try their hand at SIGSoft's Guns and Butter, an Internet-based multiplayer economic and military strategy using a BOA framework.

Other exhibits included SIGMil's Directed Electromagnetic Pulse Cannon, which was designed to test the feasibility of executing an attack to cripple electronic devices; SIGNet's Emersion, a networked presentation program for the UNIX family of operating systems, which presented a series of slides from current photos of EOH; SIGOps's SOS '02, which is an educational operating system that presents examples of operating system functions and implementations. WinDevils' Advanced SmartHome uses a home's existing AC power circuitry to provide a networked system for such functions as lighting and climate control and monitoring.

For more information on ACM and their activities, see: www.acm.uiuc.edu. Join us for EOH 2003, March 14-15.

PLO group readies for campus rumble

for making laws. We bought a lot of different radio receivers on the market and compared their reception. This was boring work and could have been done by anyone." So he left to join NTT, a communications colossus, which employed about 169,000 people. With a research lab of about 1,000 researchers, it was the largest in Asia at that time. It was at NTT that Muroga, influenced by Claude E. Shannon's landmark book, began his work in information theory. It did not go unnoticed by Muroga that this particular book, *The Mathematical Theory of Communication*, was published by the University of Illinois Press.

Having reread Shannon's work several times, Muroga sensed that something was seriously wrong. At the core of Shannon's theory was the concept of channel capacity and that this capacity was difficult if not impossible to calculate. Muroga thought

Saburo Muroga, as a visiting researcher from NTT in 1954, with Dave Muller and ILLIAC I.

otherwise, solving the problem and publishing his ideas in the *Physical Society Journal* in Japan. This immediately garnered Muroga some measure of fame.

Muroga decided to spend a summer, supported by a Fulbright grant, at the famous MIT, so he left Yokohama on a 13-day voyage by cargo ship to San Francisco and a 3-day train trip to Boston, drinking Coca Cola for the first time. He was hired as a research assistant by Robert M. Fano, who was renowned for his work in information theory and was the first director of Project MAC (now the Laboratory of Computer Science).

Muroga visited Illinois for the first time to meet with Professor Dave Muller, who had developed a new error correcting code which ran during transmission. "I noticed then," said Muroga, "a big difference between Illinois and MIT in terms of professors' attitudes toward students. Illinois professors were nicer, they spent more time with students, and advisers were more accessible." Because of his visa restrictions, Muroga had to return to Japan in the fall. This time he took a passenger ship, but it still took 13 days.

When Muroga arrived back in Japan, he was a computer celebrity—the first Japanese scientist ever to use a big computer, the ILLIAC. "At that time," he noted, "there were only a half dozen computers in the U.S., and only the ILLIAC was available for education. Illinois was on the frontier of education with the latest technology."

Japan, on the other hand, had only three or four computers, all built by older Japanese people who based their designs on what they read in technical journals. They built them, but they didn't use them, Muroga pointed out, because no one knew how to write programs. He was a hero in the sense of having been an actual user of a computer. "Every week, I went to NEC to teach the basic concepts of computer science," he said, "starting with binary numbers. I had a small class, attended by the best young engineers, one of whom later became vice president of NEC in charge of software." That was Yukio Mizuno. Muroga's popularity grew. His phone was ringing every five minutes. He was asked to give lectures and write articles. He was becoming too busy, and by that time he had a young family to tend.

A Japanese invention called the Parametron, a new type of logic gate consisting of an inductor, capacitor, and resistor, had just begun appearing in Japanese computers. An alternative to the unreliable early transistors, many people were excited about the Parametron, including Muroga's manager at NTT. But Muroga found the Parametron to be too slow and declared the technology was hopeless. This led to friction, corporate politics were insurmountable, so he decided to take a break by leaving Japan for a few years.

In 1960, Muroga joined IBM Research in Yorktown Heights, N.Y. Labeled as unpatriotic, he was the first of a perceived Japanese brain drain. During the same year, Leo Esaki, the 1973 physics Nobel Prize laureate, left Sony to join IBM. After several years at IBM, Muroga embarked on a career in academia where he could teach and conduct research in logic design; finding his true calling.

By this time, in 1964, Muroga had gotten to know many people at Illinois, so it was a natural place to come. He intended to stay for three years and return to Japan. "I wasn't sure I could survive in this country," he recalled. "But this place was really nice and comfortable, like a paradise. I ended out staying 38 years. Because of the strong support of the department, I had really good research partners, students, and visiting scholars." Many of these visiting scholars came from Japan, and Muroga became a sort of ambassador between Japanese and American computer scientists.
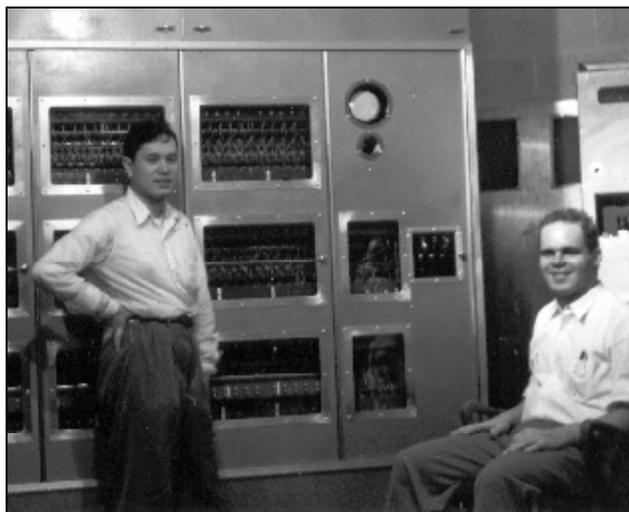
Muroga's research flourished at Illinois. In Japan, he had developed a new type of design theory called threshold logic, which formed the basis of his landmark book, published in 1971 by John Wiley. The book, long out-of-print and fetching high prices in the used book market, is currently enjoying resurgence among neural network researchers whose ideas essentially extend the notion of threshold logic. A threshold logic circuit, which is characterized by inequalities, is a departure from traditional logic design theory, i.e., switching theory. In threshold logic, traditional Boolean-algebraic gates, such as AND gate, and different types of gates, such as NAND gate, are treated as unified by inequalities. Muroga devised a way to minimize the number of logic gates in a threshold logic network and came up with the important concept of integer programming logic design. This introduced, for the first time, the concept of an absolute minimization of the number of gates or connections in a logic network into switching theory. Extending this notion, with his student, Hung-Chi Lai, parallel adders were designed with a minimum number of NOR gates, no matter how many bit positions the adders have, thus solving a problem known to be difficult. Another logic minimization method that Muroga and visiting scholar Yahiko Kambayashi developed is the transduction method, which was adopted as the de facto industry standard by major CAD companies including IBM, Synopsis, Cadence, and Mentor Graphics.

In addition to his research, Muroga is known for the mentoring of his graduate students, many who have gone on to extremely successful careers in industry and academia. "The success of my students has been most rewarding," he said, referring to them as his brainchildren. His weekly lunches with his graduate students and visitors are a thirty-year tradition. A workaholic, Muroga once read a dissertation while standing in line at Disneyland. He keeps current with the latest technologies by reading countless articles, which has been good for both his teaching and his investments.

Muroga's name will live on in the department in the form of two endowed positions named in his honor. Former Dell executive Doug MacGregor, MS 80, established the Faiman and Muroga Professorship, now held by Professor Marc Snir, and former Toshiba executive Shigenori Matsushita, MS 63, established the Muroga Fellowship, which will be awarded for the first time next fall.

During his retirement, Muroga plans to finish supervising his remaining PhD students and to revise his VLSI system design book, which was published twenty years ago. Opera and Japanese history occupy his leisure time. Anyone who has been in his office in DCL knows that he likes to collect things, in this case, mountains of technical papers and journals. At home, he collects items of a different sort: Japanese antiques, art glass, engravings, and glass paperweights. Muroga has two sons and two daughters. (One son, Eisuke Muroga, is also an Illinois educated computer scientist, BS 80, PhD 90.) His wife, Yoko, has put in countless hours of volunteer work in the local schools and taught calligraphy at the university. They live in Urbana.

It seemed like forever that there was a hole in the ground. Now the building is taking shape with beams rapidly filling the sky and a roof over head. It is being filled in with floors, ductwork, and concrete blocks. What will we fill it with?

Watch the timelapse construction video at:
www.cs.uiuc.edu

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