Marc Snir becomes eighth head of department

Marc Snir

Marc Snir became head of the computer science department on August 21, 2001. He comes from IBM's T. J. Watson Research Center in Yorktown Heights, N.Y., where he has been since 1986. A senior scientist, Snir was most recently leader of the Scalable Parallel Systems Group. Before IBM, he has held academic positions with Hebrew University of Jerusalem and New York University. His BS (1972) and PhD (1979) are from The Hebrew University of Jerusalem.

Snir began his career at New York University in 1981 during the Ultracomputer project, an early exploration of large-scale, shared-memory parallel computers. The project was led by Jacob "Jack" Schwartz, a parallel computing pioneer and distinguished mathematician whom Snir greatly admires. This was about the same time Illinois was building Cedar, the hierarchical shared-memory supercomputer project led by David Kuck. Frequent exchange between researchers at Illinois and NYU gave Snir a good look at computing at U of I. After two years at NYU, he returned to Israel and spent four

Our new Web pages are up!
www.cs.uiuc.edu

Siebel receives Presidential Award and Medallion

Tom Siebel received the Presidential Award and Medallion from University of Illinois president James Stukel on October 30, 2001, for his "commitment to excellence in software engineering, computer science research, and graduate education, and to his continuing commitment and generosity to his alma mater."

Siebel, who founded Siebel Systems in 1993, has three degrees from the university: a BS in history (1975), MBA (1983), and MS in CS (1985). In 1999, he donated $32 million to help construct the Thomas M. Siebel Center for Computer Science. A corporate gift from Siebel Systems in 2000 established the Siebel Scholars Fellowship Program.

"The U of I is recognized as a global leader in information technology," Siebel said. "I am honored to receive this recognition. As someone who has benefited greatly from the leadership of the university, it is my pleasure to play a continued role in the success of this institution.

Ten people have received the honor since it was established in 1984 by Stanley Ikenberry, who was then president. Siebel was presented the award in Palo Alto, Calif., during the fall 2001 meeting of the Silicon Valley Roundtable, a group of alumni business leaders working on the West Coast who advise Stukel and the UI Foundation on technology, business, and alumni issues. The Roundtable was established in 1997. n

Tom Siebel, with his MS advisor Geneva Belford and the Presidential medallion

New faculty

Jiawai Han

Jiawai Han, professor, received his PhD from U of Wisconsin in 1985. He was professor of computer science for 14 years at Simon Fraser U in Vancouver, B.C., Canada, and has been research director at DBMiner Technology since 1997. His research interests include spatial data mining, data mining and warehousing on the Web, bioinformatics, DNA, multimedia, and deductive and object-oriented databases.

Jennifer Hou

Jennifer Hou, associate professor, received her PhD from U of Michigan in 1993. Her research focuses on protocol design and implementation for multicast routing and multicast, network modeling and simulation, wireless QoS, coordinated congestion and error control for Internet servers, real-time communications, and real-time task management. She joins the department from Ohio State U.

Steven LaValle

Steven LaValle, assistant professor, received his PhD from UI in 1995 and held positions at Stanford and Iowa State after that. His current research interests are in robotics, motion planning, computational geometry, artifical intelligence, computational biology, computer vision, computer graphics, and control theory.

José Meseguer, professor, received his PhD from U of Zaragoza, Spain, in 1975. His research interests include formal executable specification and verification, software composition, reflection and metaprogramming, object-oriented specification and software architecture, concurrent, distributed, and mobile computing, logical frameworks and formal interoperability, and logical and semantic foundations. He has been principal scientist at SRI's Computer Science Laboratory since 1984.

José Meseguer

Edgar Ramos, assistant professor, received his PhD from UI in 1995. His research areas are combinatorial and computational geometry, randomized algorithms and derandomization, optimization and appoximation algorithms, mesh generation, topological methods and algorithms, and parallel algorithms. He will join the department in January 2002 from the Max-Planck Institut für Informatic. *(no picture)*

Mahesh Viswanathan, assistant professor, received his PhD from Penn in 2000. His research interests are in analysis and validation of software systems, including design of efficient algorithms, characterization of computational limitations, development of formal models for system specification, and implementation of software tools for program analysis. n

Mahesh Viswanathan

NCSA wins grant

In August 2001, NCSA was named a corecipient of a $53 million federal grant to create the fastest and most powerful computer system ever built for general scientific research. Called the Distributed Terascale Facility, the system will be able to perform 13.5 trillion calculations a second.

Argonne National Lab, Cal Tech, and the San Diego Supercomputer Center shared the award. There will be four groups of computers at each facility linked by a Qwest fiberoptic cable network sixteen times faster than any existing high-speed research network. The system, which will use 3,300 Intel processors, will go online in 2002 and be ready for peak performance in 2003.

"This award reflects the National Science Foundation's confidence in the long and distinguished history of computer at Illinois," said UI Chancellor Nancy Cantor. NCSA is under the direction of Dan Reed, who was instrumental in the success of NCSA's bid. n

From the corner office . . .

Marc Snir

I write my first column for the alumni newsletter as I complete my third month as head of computer science. This has been an exhilarating experience. I knew that I was joining a superb department, with a long and proud tradition. However, I did not expect the breadth and depth of research and education that I found, the professionalism and dedication of the staff, the wealth of student activities, and the friendliness of midwestern society. I am also impressed by the dedication of many of our emeritus professors, who continue to contribute their skills and experience to the department. Finally, I was not aware how large the family that I joined was. I realize now that in addition to 39 faculty, 90 staff, 1,150 undergraduate students and 420 graduate students, I joined a family of 6,370 alumni, all proud of the achievements of the department and many helping it to continue and improve its long tradition of excellence.

The department has gone through a remarkable evolution under Dan Reed, my predecessor. Close to a half of the faculty has changed, as old-timers have retired or followed other opportunities, and new professors have joined. This includes myself and five other faculty members who joined this fall (see p. 2). They open and strengthen important research directions for the department.

Siebel Center was endowed and planned. New and exciting research projects, such as the active spaces project, were started (see p. 9). The department now has a young, dynamic faculty and has significantly increased its strengths in computer vision and graphics, networking, and computer learning. I am lucky to inherit a stronger and more dynamic department from Professor Reed. I am sure that the National Center for Supercomputing Applications is headed for exciting times as he is now fully dedicated to heading NCSA.

I can hear from my office the din of construction coming from the site of the Siebel Center, as the foundations for the new building are sunk into the ground and work is progressing on schedule. You can follow the progress with your own eyes by linking from our new home page to a Webcam pointed at the construction site.

As we approach fall 2003, when we plan to occupy the new building, we are turning our attention to the con-

tents of the building: the furnishings, artwork, and equipment that will fill its public spaces. The move to Siebel Center will marke the close of nearly forty years of association of computer science with the current Digital Computer Laboratory building. It is important that history not be forgotten in this transition. With your help, we hope to ensure that the new building commemorate the history of computer research and education at Illinois with suitable exhibits and displays.

Siebel Center also represents an excellent opportunity to explore ways we can improve our education and day-to-day operation with a modern digital environment. The building has been designed to promote interaction in small classes and small public spaces, as well as interaction remotely through digital audio and video communication. It will provide exciting opportunities to explore new collaborative environments and new approaches to teaching. Much thinking has already gone into making Siebel Center an exciting living laboratory. I expect in the coming months to solicit advice and help from you, our alumni and friends, on how to best realize this vision.

I would like to close this column by briefly discussing the September 11 attack and its impact on our department. Together with the entire nation, we are mourning the deaths of the thousands of victims. Since September 11, many people in the College of Engineering have looked for ways to apply the expertise we have at the university to the fight against terrorism. In our department, there are significant research and education activities relating to digital security and privacy. We have been designated as Center of Academic Excellence in Information Assurance Education by the NSA and have recently established, with Argus Systems Group, a Center for Advanced Research in Information Security to provide a focus for collaborations with industry and other universities on issues related to information assurance and computer security. You can expect to see more initiatives in this area in coming months.

—Marc Snir

Did you know?

Tuition and fees for a 2001–02 engineering undergraduate are $4,986 for in-state and $13,806 for out-of-state. Estimated expenses for an academic year (textbooks, supplies, meals, housing, travel allowance, and personal expenses) are $9,124.

The end of an era for three of our finest

With a combined century in the CS department, Professors Kubitz, Ray, and Saylor retire

Bill Kubitz

BILL KUBITZ, BS 61, MS 62, PhD 68, first came to Illinois in 1957, and except for two brief years, he has never left. Even after retiring in August 2000, he is still with us as he represents the department in the design and construction of Siebel Center, the new home for the computer science department. When the building is completed, in 2003, he can finally really retire. But it's hard to imagine the department without him.

Kubitz grew up in Freeport, Ill., and decided to study engineering physics at Illinois, where his uncle, Oskar Kubitz, MA 26, PhD 31, was a philosophy professor and LAS dean. He and Carol Hay, BS Education 60, were married his senior year, and he stayed on for a masters degree in physics.

Kubitz went to work for General Electric in Milwaukee, but returned after two years to Illinois for a PhD in electrical engineering. He joined W. J. Poppelbaum's research group, comprised of electrical engineers, mathematicians, and physicists who were doing novel research on both digital and analog systems at a time when the ILLIAC III project was underway.

After finishing his PhD, Kubitz remained at DCL, first as a *de facto* postdoctoral assistant with Poppelbaum and then as a tenure-track faculty member. Kubitz's research focused on graphics, VLSI, and circuits. He helped build perhaps the world's first color painting system by cobbling together an analog/digital system from a color monitor and a magnetic video disk on which the user could outline a shape and then color it in.

Over time, Kubitz found himself spending an increasing amount of time discussing administrative issues with department head Jim Snyder. Kubitz had grown to be such an adept administrator that in 1985, when Bill Gear became head, he was asked to officially become the department's first associate head. He has held this position ever since. Professor Denny Mickunas is now associate head.

Kubitz was instrumental in affecting many important changes not only in the department but across the university, either directly or in his self-described role as "cattle prod." With help from Roy Campbell and IBM, Kubitz established the department's first PC labs, in unlikely places like the Woodshop and trailors on Springfield Avenue. He oversaw the major addition of a third floor to DCL, and three new sides, which wrapped around the old building. It was completed in 1989. Kubitz was an early champion of ACM and rallied the department's support of this student organization, in the form of space, equipment, and money. As the department matured, he recognized the need for the department to connect with its alumni as well as to raise funds from private sources. With his assistance, the department hired its first alumni relations and development staff member and started the alumni newsletter. When PCs became ubiquitous, Kubitz transformed the Computer Research Laboratory, initially a government-funded operation, into a fee-based research and administrative support group for the department. He has served on numerous campus committees, some of which had a major impact on technology used by the university. He, George Badger, and others spearheaded the contentious but eventually successful effort to network the entire Urbana campus. "If computing academics hadn't gotten involved," Kubitz recalled, "it'd be a real mess, and they might not have even networked anything south of Green Street." Kubitz worked tirelessly with engineering associate dean Tony Graziano to provide the computing infrastructure that has maintained Illinois's lead among engineering colleges in the country.
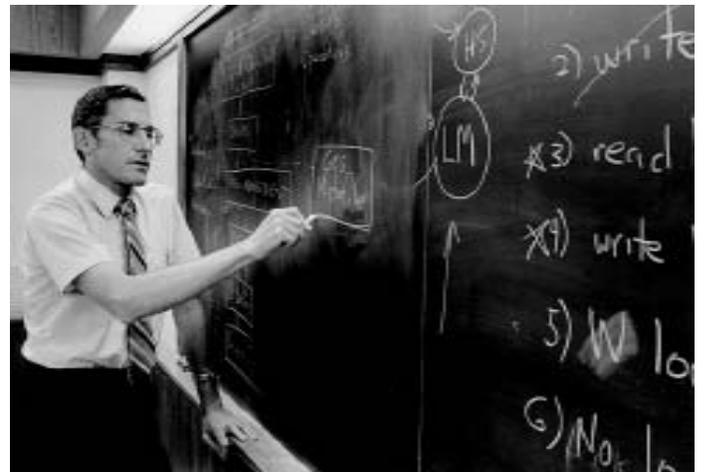
Bill Kubitz in his teaching days

Kubitz has been directly involved in keeping the curriculum in step with advancing technology. As software began to play a more important role in computing technology, he helped revamp the undergraduate program. More recently, Kubitz and Mehdi Harandi established the department's software engineering program, which currently offers a certification option. Kubitz started the department's Internet course delivery, the most advanced on campus and one of the leading programs in the country.

When Kubitz completely retires, he can add another huge achievement to the list: the construction of Siebel Center, home to the computer science department for the next millennium. Kubitz is intimately involved with every aspect of the building, from planning to construction to what will ultimately go inside.

Reflecting on his tenure as associate head, when asked about a comment he made long ago about being a zookeeper, he had this to say: "That's the nature of the place. It's a zoo, and we have lots of different kinds of animals that need different kinds of care and feeding and different environments. That's just the way faculty are. They are all people who for some reason or another decide to become faculty. Some of them love teaching, and some of them love research, but they all love being their own boss and doing their own thing. And there's a huge variety of people from different backgrounds and different countries. It's a menagerie. It's not exactly an ark because we don't really have two of everything, but sometimes you think so."

During retirement, Kubitz plans to travel and spend more time with family. Daughter Emily, BS LAS 86, lives in Kirkland, Wa., with her husband Mike Hoffman, BS Aero 86, and their two sons. Son Jim, manager of procurement systems and processes for Kroger in Cincinnatti, and his wife are expecting their second child in January.

"The greatest things about being at a university," he concluded, "are working with bright students at all levels, being surrounded by brilliant colleagues, being immersed in a highly diverse multicultural, intellectual environment, having ready access to the arts, and the assurance that you can make a positive difference for future generations."

S YLVIAN RAY, MS 57, PhD 61, retired in August 2001, after four decades at DCL. Ray is perhaps best known for his work on ILLIAC II, and he has served as ACM's faculty adviser for the past 20 years. His current research, which he will continue as professor emeritus, involves artificial intelligence and neuroscience.

Ray is from Louisiana, and after completing his BS in

electrical engineering at U Louisiana-Lafayette, he joined the Naval Research Lab in Washington, D.C., doing electronics research on undersea warfare devices, and was later drafted. Because of his EE degree and defense experience, he was stationed at the Aberdeen Provi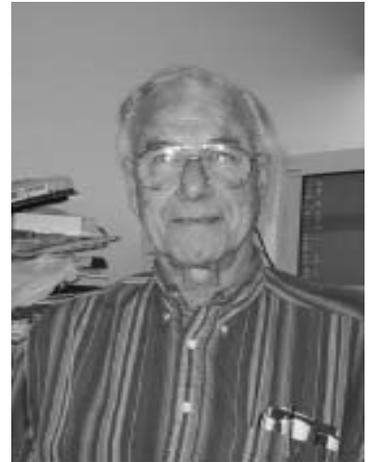ng Grounds, Maryland, and assigned to the ORDVAC group. ORDVAC and ILLIAC were two of the world's earliest digital computers,

Sylvian Ray

both built by U of I. One was for the Army and one was to keep. Completed in 1951, ORDVAC was one of the fastest computers in existence. Its main purpose was to perform ballistics computations, and ILLIAC's was for scientific research across campus.

"My first task was to learn everything there was to know about the ORDVAC," he said, "which only took about two months. Computers were so simple then that you could literally learn the value of every resistor in the machine, believe it or not. With 2,500 vacuum tubes, most of the circuits were very repetitive. All I really had to learn were the multiply and divide algorithms, some arithmetic, and how the control units worked. It was so logical that it really didn't take much time to learn it at that level. I was assigned to help with maintenance, as necessary, and to figure out how to make improvements. So I did a little research project on how to speed up register shifting and wrote a paper on it."

Ray had seen a proposal for a second generation machine written by researchers at Illinois, so when his army service was reaching its end, he decided to apply there for graduate school. "In those days," he recalled, "you didn't have to take a GRE exam or anything. There was so little demand for grad school, it was ridiculous compared to today." Ray had saved some money, visited the university, and in several days landed a research assistantship. It was 1956.

Ray was part of the group working on the preliminary design of ILLIAC II. His particular job was to design one of the logic circuits with transistors, a new technology that would increase the machine's speed 100-fold. ILLIAC II was funded by the Atomic Energy Commission to calculate nuclear blasts.

This marked the first time a computer (ILLIAC I) was used to design circuits for another computer (ILLIAC II). "These were special case programs," Ray said. "We wrote a program for each logic circuit. It was in machine lan-

guage, the most primitive thing you could imagine, like making a three-way double-crostic puzzle. It had to be simple. You understand now how much it means to have a good compiler because you were so limited. It could take you two weeks just to get a little simultaneous linear equation program finished. It was so hard to get all the numbers exactly right. It was very rigid. You couldn't edit it easily. So life was slow then in terms of programming."

Construction of ILLIAC II was especially challenging because the instrumentation wasn't fast enough to detect the speed of its circuits. Ray and his colleagues were forced to modify oscilloscopes that produced signals only 1 cm high and were fast enough to just barely deal with the circuits. The traces on the scopes were extremely dim, so they installed black shields on them and turned them up to absolute maximum speed. They were looking for a transition and measuring its switching time. "You had to sit there at least ten seconds to get your eyes adjusted," recalled Ray. "Then we would resolder a wire to make an adjustment. You didn't want to take your head away from the screen, so when you anticipated a change, you would tend to start reaching for your soldering iron. Every two or three hours in this room over in ERL [Electronics Research Laboratory], someone would yell, Ouch!"

Memory systems had been the Achilles' heel for the first generation of digital computers, due to the physics of the materials used. The ILLIAC II team intended to use magnetic core memory, and Ray, who was still a research assistant, headed the effort. "It was a bear," he said. "Everything was speed, speed, speed." There is a myth that Ray's wife strung the wires of the core memories in

Sylvian Ray behind a magnetic core plane for ILLIAC II

the ILLIAC II, but this was untrue. They were made by RCA and General Ceramics, although the bootstrapping wires were installed by Ray himself. Ray also designed all the memory circuits and registers as well as the power supply.

"During the time we tested the machine," said Ray, "Don Gillies wrote this Mersenne prime number program. That was the final test for us. It just pounded the heck out of everything, especially the memory. Every week or two, while it was computing, some solder joint would come loose, and I'd have to go down and trace it, find the problem, resolder it, and rap on the machine frame to discover loose components. It took a couple months to compute the two next unknown largest primes." The first record-setting number was 2^{11213}-1, a number more than 3,500 digits long, and it was reached in 1963. By then Ray had finished his PhD, gotten married, and had his first child.

Bruce McCormick had arrived at DCL in 1960, and he was strongly interested in building a pattern recognition computer. One idea was to create a DNA-reader—a good 30 years ahead of its time—but eventually he settled on a special-purpose machine, ILLIAC III, whose initial task was image processing of bubble chamber experiments used to detect nuclear particles. "We gradually shifted to biological images," said Ray, "which is how I got interested in biological computing. We were interested in things like locating cancer cells in microphotographs." Ray worked on ILLIAC III's memory system for several years until a fire, caused by a Variac shorting on one of the wooden-top benches, destroyed the machine in 1968.

After ILLIAC III, Ray began work in artificial intelligence. During the 1980s, he worked on a symbolic AI project on sleep disorders, using biosignals from sleeping humans to assist doctors in their diagnoses. Around this time, he turned toward neural networks.

"Neural networks looked fun—half engineering and half AI," he said. "There are AI things that you can actually construct theoretically, and you can theoretically make an actual physical device. I think understanding the brain and what it does and to take things from neuroscience and bring them into AI is a good and valid approach. I do mostly neuroscience—learning from neuroscience and bringing it over into engineering and then bringing engineering into neuroscience in the form of modeling." He also taught CS 442, a course called Artificial Neural Networks, which he introduced in fall 1990.

Ray and his wife, Emily, live in Urbana and have two sons. One is a physics professor at the University of the West Indies in Barbados, and the other is director of development support at Arsdigita, software company in Boston.

Paul Saylor

Affter 34 years with the department, Paul Saylor has retired and assumed a position at NSF. Saylor has done pioneering work in numerical analysis over the years, solving large-scale scientific problems in areas ranging from geophysics to medical imaging. He will continue his current research in astrophysics.

Saylor has always been interested in how mathematics relates to the physical sciences, and most of his life's work has revolved around partial differential equations and linear algebra. He earned his BS at Stanford, his MS at UT-Austin, and his PhD at Rice, all in math, and aimed toward an academic career. By the time he was recruited by Illinois professors John Pasta and Jim Snyder, the ILLIAC IV project was in its early stages. ILLIAC IV, which was headed by Professor Dan Slotnick, was unsurpassed in its capacity to solve huge scientific problems, and Slotnick felt strongly that the department hire a numerical analyst.

Saylor's research at Illinois has never strayed far from computational science and solving linear systems of equations. He also taught numerical analysis classes.

Saylor retired in November 2001 and moved to Washington to begin a two-year position as a program officer in the mathematical science division at NSF. Why did he accept such a position? "The desire for a quiet life," he said,

Paul Saylor on his first day at DCL

with a chuckle. He anticipates the work to be both interesting and enjoyable. "I'll be meeting a lot of people, learning new things, sort of what I've always done," he said. A bonus with the job is that he will be able to maintain his own research agenda as time allows. He is co-PI on a DOE project, combining software and astrophysics to simulate core collapse supernovae. He also has a NASA grant to study X-ray bursters, a phenomenon requiring immense computational algorithms and involving collaborators all over the country. Saylor is also gathering material on the history of computational and applied math for SIAM's 50th anniversary.

"Everyone here has been so nice and easy to work with," Saylor said. "It's been a wonderful place since day one, filled with the most remarkable people, like Don Gillies and Jim Snyder, with illustrious achievements. It was clear when I started that these were high caliber people and that Illinois was a top notch place. It's just an honor to be here, and a pleasure."

Paul lives in Alexandria, Va., with his wife, Cynthia, a nurse. Son, Gerard, MS 96 LIS, is a librarian in Phoenix, and son Gerritt, MS 95, is a computer scientist for Intel, based at Microsoft, in Seattle. n

CSL celebrates 50th

The Symposium on Information Technology was held on October 26, 2001, as part of the Coordinated Science Laboratory's 50th year anniversary celebration—a day of panels, talks, and an open house that brought back many alumni. Established in 1951 as the Control Systems Laboratory, CSL was the first major campus interdisciplinary institution.

It has been the site of many groundbreaking innovations, including advances in radar technology, a supercompass for nuclear submarine navigation, the theory that became the basis of CDMA technology, the plasma screen, and the PLATO system. CSL's research now revolves around computing, communications, and control, with a focus on information infrastructure. When CSL became a declassified facility in 1959, it kept its initials by changing its name to the Coordinated Science Lab. Originally located on the corner of Springfield and Goodwin Avenues, it is now located just southeast of the Beckman Institute, in a building that opened in 1993. CSL is directed by Ravi Iyer. n

www.csl.uiuc.edu

Mary McDowell leads Compaq server group

Mary McDowell, BS 86, is senior vice-president and general manager for the industry-standard server group of Compaq Computer Corp. She is number 28 on *BusinessWeek*'s most recent list of the highest-paid women in America. And she is a graduate of the CS department at Illinois.

No doubt, McDowell's father, William P. McDowell, BS EE 63, played a role in her decision to attend U of I. As a CS student, she was editor-in-chief of the *Technograph*, Illinois' student engineering magazine, and a Knight of St. Pat, the honorary society for outstanding juniors and seniors in engineering. She also did internships at Argonne and IBM.

When she graduated in 1986, McDowell was one of the first wave of college hires at Compaq, which was only four years old. She was recruited on campus by Charles Lee, BS EE 78, and she started out as systems engineer, working on the first Intel 386 microprocessor-based desktop in the industry. "At that time, working at Compaq was like still being in college," McDowell recalled. "It was a small company—everyone was pretty young and really focused on the mission. The 386 project was Compaq's first chance to break ahead of the competition, and everyone was dedicated to making that happen. It was an effort that inspired passion among everyone in the company," she said.

Although her original plan was to move back to the Midwest and go to law school, McDowell kept finding new opportunities that would keep her at Compaq. In mid-1998, she was assigned to the team planning the industry's first Intel-based server, the Compaq Systempro. "It was extremely exhilarating," she said. "We put in 80- to 100-hour weeks planning every aspect of the machine and supporting infrastructure within the company like sales, service, and manufacturing. It was almost like a startup, and we had *carte blanche* to develop whatever capabilities we needed to make the product a success." Unfortunately, while a technology *tour de force*, the product was a business failure. In early 1992, the server team was given an ultimatum to make money or be disbanded.

McDowell led the efforts on a new low-cost server that put the group in the black and propelled Compaq to number one market share. From that point on, the business exploded and McDowell's responsibilities grew with the server business. After serving in leadership roles in product marketing and strategic planning, McDowell was appointed to lead the industry-standard server group in 1998. Revenues for her group exceeded $9B in 2000. In spite of increased competition, Compaq remains the top Intel-based server producer in the world, and, due to a substantial R&D investment, it plays a key role in driving technology standards for servers.

"What attracted me to this job," she said, "was the rapid rate of change. Every day you're learning and re-learning how to be effective." Especially during these challenging times IT is facing, McDowell feels that customers are no longer going to be driven by the "metronome of technology," and that computer companies will have to better demonstrate how their technology will help customers meet their business objectives.

The impending merger between HP and Compaq will undoubtedly have a tremendous impact on McDowell's future. Her boss, Michael Capellas, is slated to be the company's president. But right now, she said when asked about it, "I'm staying focused on business execution as we go through the merger process."

McDowell and her husband Kevin Longino, a former Compaq executive, live in Houston, Tex., where she is a huge consumer of murder mystery novels, sings in a church choir, and likes to travel. She continues to think highly of Illinois. "Everything your parents told you about the midwestern work ethic is true," she said. "This is something highly sought after in business." n

www.compaq.com

Mary McDowell

Let us know . . .

what has been happening with you. Not only do people in the department want to hear about your career and life, but your fellow alumni are also interested in your activities. Send info to alumni@cs.uiuc.edu.

Active spaces on bleeding edge

Active Spaces is an exciting project percolating deep within the recesses of DCL, involving a large cross-section of the department. Researchers are creating an advanced prototype of an interactive environment, called an active space, which attempts to bridge the gap between virtual and physical spaces. The active space concept integrates physical spaces that contain ubiquitous computers with a computational environment that supports human activity and applications. The users' view of the environment extends beyond the physical limits of a computer to the surrounding physical space, which is augmented by computers that sense and affect that space. For example, applications are mapped not just to views associated with windows on a monitor but to the physical environment. This environment is a *de facto* distributed computing system.

An active space system is similar to a traditional computing system. In the traditional system, the computer is one object, composed of input and output devices, resources, and peripherals. The traditional operating system manages the tasks common to all applications on the computer. But because of the heterogeneity, mobility, and number of devices in an active space, the active space system is far more complex, and a new operating system is needed.

Roy Campbell, who heads the project, has developed an active space operating system called Gaia, an OS which exploits standards for interoperation and cooperation. The system must track, authenticate, and support mobile users with reconfigurable graphics, multimedia, and active space applications. Campbell has used a distributed object bus (that runs over wires, wireless, and optical fibers), component model, and adaptive stream model to extend plug-and-play to distributed mobile ubiquitous computers operating within the active space. The Gaia OS must be able to locate the most appropriate device, detect when new devices are spontaneously added to the system, keep track of dependencies between codes, and adapt content when data formats are not compatible with output devices.

The variance between systems causes tremendous problems. For example, what do you do when a user wants to view on a cell phone a video off a supercomputer, playing at 1.5 gigabits/sec? Do you adapt the data to the cell phone, or do you completely change it and provide an interface so that it can be scaled down to a postage-stamp-sized display? "A big part of the problem," said senior research programmer David Raila, "is determining what to do and what would be useful to the user." Raila, BS CompE 88, MS 92, handles the streaming media portion of the Active Spaces project.

By merging physical and informational realities, changes made in one that affect the other are best manifested by graphics and displays. Active space researchers are developing principles about how physical and computational activities are related. This work is an outgrowth of the Model-View-Controller work done at XeroxPARC, which led to the Smalltalk-80 user interface. The MVC paradigm involves user input, modeling of the external world, and visual feedback. Campbell's research carries this notion further. "We are writing everything on top of what looks like a distributed object system," he said. "We are using IDL from CORBA to provide the interfaces, and for implementation, we can use a number of things, like CORBA, Genie, Windows, or DCOM. The key thing is to have the tools to link in new implementations very quickly."

This new technology occupies an active space demon-

Roy Campbell in the active spaces demonstration room

stration room on the second floor of DCL, which is becoming more compelling as everything becomes increasingly dependent on the infrastructure. After getting the devices to work (no small task), researchers can now switch them on and off from the infrastructure and can integrate them with plasma display panels. Sharing the room with four 60-in plasma panels from NEC are 16 1.2 GHz Pentium processors from Intel, audio equipment from C.V. Lloyde, and a video wall for HDTV from Philips, all connected by a Gigabit switch from Foundry Networks.

In the HDTV studio down the hall are a Sony HDTV camera and Avid DS HD editing suite, where researchers can render images on one of NCSA's supercomputers. EchoStar Communications has granted a license to route IP HDTV within DCL. In other words, Campbell's group has a full, end-to-end, high-definition TV system consisting of every link in the chain, from the information source to your eyeball.

The Active Spaces project arose from exploring ways to make the new computer science building, Siebel Center, a "smart" building. Campbell, Denny Mickunas, and Dan Reed are focusing on the infrastructure

David Raila

part of the project. Klara Nahrstedt is focusing on multimedia and quality of service issues, Robin Kravets is handling networking, David Kriegman is addressing recognition, and Michael Garland is overseeing graphics issues. Altogether, more than 50 researchers are concentrating on Active Spaces, and the project is funded mostly by NSF.

"Siebel Center will be a prototype or precursor to what will eventually become ubiquitous," said Campbell. "It's got to start from small beginnings—specific projects, rooms, buildings. You really don't want to be carrying around a lot of electronics. You want to be able to walk into rooms and have them configure the way you want them to. You want to be able to put up whatever you want on the walls. In the long term you should be able to wander around without any PDAs or electronics on you at all and have the machines know that you're there and be able to interact with you." ∎

devius.cs.uiuc.edu/gaia.

Illinois Internet Computer Science Program (I2CS)

The Illinois Internet Computer Science Program (I2CS), formerly known as the IMCS program, offers graduate-level computer science courses via the Internet to professionals from within the United States and around the world. The program delivers the same lectures, class assignments, exams, and projects as the on-campus students. Both groups have the same standards for grading and assessment and receive the same credits. Students have the option of applying to the MCS degree program to complete their MCS degree or registering as a non-degree student to either complete an individual course for professional development or to complete a sequence of three courses for a specialized certificate.

On-campus class lectures are captured live and are available for Internet viewing within an hour of the lecture. Class slides are synchronized with the lecture to recreate the environment of the classroom. Each course uses threaded discussion boards, video conferencing, and email to communicate. Instructors and teaching assistants correspond with students on a daily basis through email, class discussion group, phone, or via Net Meeting.

Currently, there are about 90 students in the MCS degree program and about 150 non-degree students. As of summer 2001, 44 students have graduated from the program with their MCS degree. Students in this program are usually part-time students who work full-time and take one to two courses per semester.

The I2CS program offers students:

- **Flexibility** Take one course or several or take a class every summer or every semester; it is up to you and your schedule.
- **Choice** Enroll in a course for professional development or complete the Master of Computer Science.
- **Comfort** Stay where you are, travel only on the Internet. No residency required.
- **Excellence** Since the on-campus courses are delivered over the Internet, you can depend on the same level of excellence.
- **Opportunities** Interact with other program students through asynchronous discussion groups.

For more information on the courses we offer through this program or for information on admissions requirements to the MCS degree program, please visit our Web site or send email to i2cs@cs.uiuc.edu. ∎

www.cs.uiuc.edu/i2cs

How McCool are these guys?

Rob and Mike McCool, both BS 95, are noted for being part of the original Mosaic team at NCSA and the server team for Netscape. Now each is heading a new startup—Rob with Alpiri, a software company, and Mike with Slightly Subtle Technology, a game company. With outstanding track records, they are destined to find success once again.

Twins Rob and Mike grew up in suburban Westchester, Ill., with an Apple 2e and Atari 2600 in their room. When they came to U of I, Rob immediately began working at NCSA as a systems administrator, and Mike did database work in a vice chancellor's office and staffed CCSO's general help desk. Eventually, he too landed a job at NCSA. "We were a bunch of geeks sitting around in the darkened basement of OCB," he recalled. The Oil Chemistry Building (OCB) on Wright St. was the NCSA site that housed the Mosaic project. They also did work for Brian A. Rice, a small game company.

When the Mosaic browser was born, co-creator Marc Andreessen, BS 94, wanted to do a Web server that would actually

Rob McCool

create documents (one of the earliest forms of dynamic content). He recruited Rob, who did the HTTP development. Mike joined later and worked with Aleks Totic, MCS 94, on Mosaic for the Macintosh. When Mosaic Communications, which would become Netscape, was formed in May 1994 in Mountain View, Calif., Rob and Mike remained on campus to finish their degrees. Both ended out telecommuting before moving to California.

Mike joined Rob at Netscape, and together they made up the entire server team. "When we first released the server in September," Mike recalled, "No one had ever opened and closed that many connections to a server before. The kernels for most operating systems had so many bugs you couldn't scale it. The hit rates on the main server were so high, it'd freeze up in kernel panic every hour or so. We'd have to work around these problems, with windows in the background. We'd have to kill the server, fix it, and bring it up again. We were on 24-hour watch for about a month. We staggered our schedules so we could get some sleep. It was pure insanity." The virtual memory systems for most of the operating systems at the time were also the source of many headaches, not only because of the bugs but also because of bottlenecks.

Four years after joining the company, and after producing nine server products, the McCools left Netscape. While Mike was in Illinois helping his father recover from a broken shoulder, he began work on a game based on the 1910 C. M. Coolidge painting "Looks Like Four of a Kind," better known as Dogs Playing Poker. First, he wrote a Java version for the Web. When his father recovered, Mike returned to California, where he and Rob both did some work with Geocast, a short-lived startup that was building a device to receive cached multimedia files from digital broadcast sources by taking advantage of unused spaces in the compressed data from digital television data transmissions. It was at Geocast that Rob met Epinions co-founder R. V. Guha. In February 2001, Geocast ran out of money and closed.

Mike McCool

Mike resumed work on his poker project and did some contract work with Intrinsic Graphics, writing a 3D game development tool called the Finalizer. The poker game on the Web became a prototype for a commercial product for the PC, featuring realistic, 3D dogs and more sophisticated poker playing algorithms. He is also working on a Bughouse chess game for the computer.

Rob and Guha started a company called Alpiri, based in Mountain View, and named after a town in southern India. The idea was to simplify Web transactions by improving the Web's infrastructure-level software. "The current Web is a human-to-machine Web," Rob explained. "There is a lot of movement toward Web services in which machines ask machines for data over the Web. It would be nice to exchange the data the way humans exchange documents, but when you start doing that, you run into problems. Different companies have their own names for things. For instance, a Nokia cell phone at Amazon has one product code and another retailer has another. What we want to do is enable communication. Right now I have to maintain a mapping of my name for something with Amazon's name for something. Instead, we are applying techniques of knowledge descriptions and relationships. Instead of sending around a number, we send around a description. The basic idea is that for all of these Web sites to become integrated, they have to agree on a core vocabulary." For instance, someone who plays music will be called a "musician." When Alpiri's server sends out a description of a particular musician, it

Janet Chin: From graphics to Taiko

Janet Chin

Janet Chin, MS 73, has become something of a celebrity on Bay area television lately, having appeared in a recent PBS series on death and dying, an episode of an ABC news show on hidden allergies, and a film on women of color in martial arts. But she has been first and foremost a computer scientist.

Chin was born in Hong Kong, moved to Connecticut from Taiwan, and then moved to Chinatown in Chicago. Her father was a bartender at Chiam Restaurant while her mother went to programming school. As a child with small hands, Chin helped with her mother's homework wiring circuit boards. Her parents were devoted to her education, and Chin took the long bus ride from Chinatown to Providence High School, where she excelled in mathematics. An accomplished pianist, her parents convinced her to study something more practical than music, so she enrolled at UI-Chicago Circle.

Chin earned her BS in 1970 with honors in mathematics and was one of only two women who minored in physics. Chin went to graduate school in computer science at Urbana, where she worked for C. W. Gear, Tom Murrell, and David Kuck.   Her first job was at Lawrence Livermore National Laboratory in California, where she did research in secure operating systems and graphics.

Chin left the lab to join a company called Tymeshare. One of the pioneers of networking, Tymeshare owned and operated a worldwide system of huge servers that were networked together, and they provided computer times as well as various software packages for users. While at Tymeshare, she became a member of the ANSI committee for computer graphics software.

Several years later, Chin moved to a short-lived company called Fortune Systems, where she led the computer graphics team. She then went to Impell, an engineering firm expanding into CAD systems. The company was purchased by Combustion Engineering, which decided to scrap the CAD effort, so Chin took a break from being on a corporate payroll and tried consulting on her own.

Consulting for Sun Microsystems led to a full-time job at Sun in 1988, where she was department manager of their graphics software area and later a business development manager. In 1992, she returned to CAD, working for Cadence Design Systems and then for Avant!, which was founded by former Cadence people. All the while, she had continued her work on graphics standards, and she cowrote *The Computer Graphics Interface*, a book published by Butterworth-Heinemann in 1991.

After Chin's father passed away and her mother developed stomach cancer, she left the workforce to devote full attention to her mother's care.

Chin is now retired and enjoying life in the Montclair area of the Oakland hills with her partner, Lin, a cellist who works for Acuson. Chin has returned to her artistic side, playing piano (she and Lin are preparing to perform the Kol Nidrei by Max Bruch), practicing martial arts (she holds a black belt and specializes in kata and iaido), and performing with Emeryville Taiko, a Japanese drumming group. n

---

McCools, continued from page 11

will return a set of properties about that musician, for instance, biographical information, related items for auction or sale, and concert dates. Rob explained, "The advantage of the vocabulary is that they only have to agree on the general vocabulary, not on the specific product numbers. Mapping product numbers among thousands of sites wouldn't work, but if they agree on a small set of general terms, such as 'cell phone, a communications device' or 'Nokia, a company,' then they can negotiate to something more specific."

Alpiri's software is based on XML and has a fairly sophisticated caching architecture. The company caught the attention of *Red Herring* magazine, when its beta version went live in September, and the result was an article in the September 15, 2001, issue, which catapulted Alpiri into the public eye.

Rob is doing a deft job balancing his work with his personal life, which he shares with his wife Lydia, a pianist. And although immersed in a world of virtual dogs, Mike lives with two real cats, Pip and Squeak. n

www.alpiri.com
www.dogsplayingpoker.tv

Ken Gaebler: always the entrepreneur

Beautyjungle, a company co-founded by Ken Gaebler, BS 85, rose and fell spectacularly during the dot-com craze. But Gaebler himself managed to land on his feet, and like a phoenix, he's on the way up again as CEO of no less than three startups.

Fresh from the computer classes he took in high school in Oak Park, Illinois, Gaebler enrolled in computer science at U of I. He was a serious student but took time for extracurricular activities as well, playing with a soccer club, selling advertising for the *Daily Illini*, participating in the student senate, and chairing the student IEEE chapter. Although he enjoyed being at the university, he was eager to get out, and he graduated in only three years.

Gaebler's first job was in Chicago with Arthur Andersen's information consulting division, the predecessor to Andersen Consulting. Four years later he joined the Information Consulting Group, a new systems integration company cofounded by ex-Andersen employee Alan Bernstein, BS 74. To complement his expertise in IT strategy, Gaebler returned to school, earning an MBA from Yale in 1993. In June of that year, he started his own company in Chicago, VREAM.

VREAM, meaning "virtual reality dream," produced real-time, 3D graphics software for PCs. The company was tremendously successful, receiving critical acclaim, including a *PC Magazine* Editor's Choice Award, for its VR software. When VREAM was sold to Platinum Technology in 1996, Gaebler stayed on and ran their visual computing group until it was phased out in 1998. That's when he and two others started BeautyJungle, a cosmetics and beauty supply online retailer.

"We looked a tons of ideas," Gaebler said, "and stumbled onto the idea of selling beauty products online. It was a great market, the products were lightweight and high margin—ideal for e-commerce." Few companies were in that space and certainly none was dominant. Gaebler was COO and director of the company. After securing seed money from individual investors, Beautyjungle was infused with $18M from DivineInterventures, the Internet holding firm of Platinum founder Andrew "Flip" Filipowski.

Beautyjungle was high-profile and enjoyed meteoric growth. Of the 50 leading companies evaluated by Resource Marketing in September 2000, BeautyJungle held the third spot, right behind Amazon, as a leading online shopping site. But the dot-com bubble burst shortly thereafter, and although it was universally recognized as a premiere online retailer of cosmetic and beauty supplies, with operations in three cities, BeautyJungle closed its doors in November 2000 and sold its assets to Fashionmall.

Never one to sit still, Gaebler is hard at work focusing on the September 2000 launch of three new technology-based companies in Chicago. They are Astute Diligence (due diligence for private-equity firms), Grand Roads Executive Search (headhunter), and Walker Sands Communications (marketing and public relations). Gaebler is CEO, for now, of all of them.

Ken Gaebler

Gaebler lives in River Forest, Ill., with his wife Ellen, who formerly ran the Oak Park children's museum, their two young children, and a new dog. He continues to play soccer and participates in a book club (started in 1985) and a winetasting group. ▪

CHRIS TRIMBLE, BS 95, spoke to students in November 2001 about his career and the computer graphics industry from his perspective as a CG supervisor at PDI/Dreamworks, in Palo Alto, Calif. The company focuses on computer-animated feature films, like *Shrek*, and on commercials, like the new Intel commercials. He gave his talk to students in CS 100, a class taught by Sam Kamin to expose CS freshmen to the variety of career opportunities available to CS grads. ▪

Alan Braverman starts Mollyguard

Alan Braverman, BS 96, recently cofounded a company called Mollyguard, one of the first to produce software that sits on top of the PayPal platform. PayPal, the leading online payment company, was cofounded by alum and friend Max Levchin, BS 97. Mollyguard's first two products allow online newsletter publishers to charge subscription fees and event planners to charge registration fees, via PayPal, which published an API that allows others to build vertical applications on top of it.

Alan Braverman

Braverman, from Mt. Prospect, Ill., was chair of ACM and worked at NCSA on Mosaic for X while he was a CS student at Illinois. He also worked with Bruce Schatz on digital libraries. After graduating, Braverman went to SGI as a software engineer working on Web utilities. After three years, he joined eGroups as their first engineer and the first of a group of nine Illini at the company, which then employed about 80 people. Braverman devoted a lot of time to ad serving projects. When online ads became less popular, he decided to start a new company with Stanford grad Kevin Hartz. The name Mollyguard came straight from UI (see next article).

"Mollyguard is a two-person operation right now," said Braverman, "and we rely on a lot of favors from people. It pays to have a strong network of friends including a lot of Illinois grads. Our companies use each other's products." For example, Mollyguard uses servers at A-Link Network Services, a company co-founded by Jim Browne, BS CompE 94, Tom Caruso, AB SpCom 89, and Randy Levy, BA Accy 89. (The three are now VPs at Netility.)

As big PayPal fans, Braverman and Hartz jumped on the idea using the PayPal API called WebAccept and PayPal's Instant Payment Notification to build products. It is Mollyguard's job to facilitiate the transaction be-tween two parties, and PayPal does the nitty gritty of the actual transaction. "We rout the parties to PayPal, PayPal notifies us, and they get routed back," Braverman ex-plained. "In other words, they get temporarily diverted to PayPal and then back."

"I wish there were more hours in the day," said Braverman, who lives in San Francisco. "I'm pretty much always working, always on call." But he does find time for surfing (the real kind, in the ocean) and running. n

www.mollyguard.com

Mollyguard?
Ed Krol explains

Ed Krol explains the origins of the word Mollyguard, which dates back to 1982, like this: "I was concerned with the Cyber [mainframe], and right behind the Cyber console was an IBM 4341—a nondescript, singularly unimpressive, desk-sized grey machine. The only thing about it was that on one side was a big red switch—kid-sized, about 2 inches wide. The switch was like the emergency OFF switch, and if you pulled it you actually had to call an IBM engineer to come in and reset it. There was some crisis on the Cyber, and I was babysitting that day, and so I took my daughter Molly in to work with me. I said, 'You play with your trucks on the floor while I work,' and she saw this amazing big red thing and gave it a yank and turned it off. You weren't supposed to do that to those big machines at the time. Our computer center director then had little plexiglas flaps installed so that you had to lift the flap up before you could pull the switch. Charley [Kline] named them Mollyguards to protect them from Molly. It was a funny play on words, too, because molybdenum is a slippery element and there used to be a grease called Molygard."

Ed and Molly Kroll

Krol, BS 73, is now assistant director of CCSO, and Kline, BS 84, MS 86, who was a student hourly at the time, is now principal research programmer at CCSO. Molly Krol is a senior at Luther College in Iowa.

It was Kline who submitted the word Mollyguard to the Jargon File, a collection of computer slang from various technical cultures begun by Raphael Finkel at Stanford in 1975. Here is how it appears on this list, mirrored on many Web sites:

molly-guard /mol'ee-gard/ n.

[University of Illinois] A shield to prevent tripping of some Big Red Switch by clumsy or ignorant hands. Originally used for the plexiglass covers improvised for the BRS on an IBM 4341 after a programmer's toddler daughter (named Molly) frobbed it twice in one day. Later generalized to covers over stop/reset switches on disk drives and networking equipment. In hardware catalogues, you'll see the much less interesting description "guarded button." n

Danger: Brian Swetland

Brian Swetland

Brian Swetland is a senior firmware engineer at Danger, a company that recently uncloaked with its new product, the Hiptop—a handheld, wireless communication device aimed squarely at the consumer market.

Swetland came to UI from Wonder Lake, Ill., in 1994 and landed a programming job at NCSA, where he worked on newsreader support, networking, and general bug-fixing for Mosaic. Although he was a student for a year and a half, he was on campus for four. His first commercial job was with Neoglyphics, a Web company started by former CS student Alex Zoghlin.

Swetland was very active in the Be Users Group of ACM and was in the company's developer program. There was a Be Box in the ACM office that had no SCSI support, so Swetland wrote a driver for the disc controller. During this process, he kept "bugging" one of Be's kernel guys. Swetland found a bug in the kernel, which prompted Be engineers to recruit Swetland for themselves. "I couldn't resist," Swetland said. "One of the reasons I wanted to go to school was to do kernel and OS work, and here was an opportunity to do that and get paid."

After two years, Swetland left Be, and in May 2000, he became Danger's 13th employee. Danger was only five months old and in stealth mode. "It was really neat working on something secret," he recalled, "but it was hard because I love talking about what I do." What he was doing was working on the core operating system of what Danger engineers simply called The Device.

The Device evolved into a real product, now called the Hiptop, which first demoed in September at DEMO-mobile 2001. The company has grown to about 60 employees, including former classmate Vic Adukia, BS 00. Swetland has managed to avoid sleeping in the office and other such pitfalls, so he has been able to take Japanese language classes and pursue his childhood pastime of writing software for fun. "That's one of the things that worked out well," he said. "I was afraid that I've had this hobby forever and that it'd stop being fun if I did it for a living, but there's so much different stuff to do. At Danger I'm working on software that runs on an actual piece of hardware. It's on the consumer electronics side with a broad appeal. It's a big old adventure, and I'm going to stick with this and see where it goes." n

www.danger.com

Long and Jeske: Neotonic, anyone?

Another Illinois startup has formed in Silicon Valley. Called Neotonic, the company was cofounded in June 2001 by David Jeske, BS 96, and Brandon Long, BS 95, MS 97. Jeske and Long's friendship dates back to Springman Jr. High School in Glenview, Ill., and continued through ACM days in college. They both wound up in California at eGroups, which produced an email and web-based groupware platform. The company was acquired by Yahoo in September 2000 and the service has evolved into Yahoo! Groups. At eGroups, Jeske was director of engineering and Long was server engineer. They both left the company shortly after the acquisition.

As a student, Long worked on NCSA's HTTPd, one of the original Web servers, and on Mutt, an Open Source email client. Before joining

Brandon Long and David Jeske

eGroups, Long worked on microprocessor design at Intel. Jeske has worked at a number of companies, including 3Dfx, S3, and Argonne National Laboratory.

Neotonic's first product is a Web templating tool called ClearSilver. Its second, a CRM tool called Trakken, is an application they built on top of ClearSilver.

The climate for starting a company these days is pretty rough, admitted Long, but they already have some beta customers and are optimistic. "It's a tight funding environment for certain types of companies," he said, "so we're trying to produce a more traditional, working, profitable product. On the plus side, the employment environment is less competitive right now." Jeske added, "There isn't a lot of funding floating

around, so it's much easier to bootstrap a profitable company. Two years ago, had I walked around San Francisco, I would have found three funded competitors with an 'e' prefix and a '.com' suffix doing the same thing. Now there are for-lease signs."

Long and Jeske learned a lot during from their eGroups experience, from software engineering to how to do Web-enabled applications. Because eGroups started out as a small company, they were friends of the founders and got a bird's-eye view of how to run an Internet startup, how funding works, and how to run projects and product teams. At its peak more than a dozen of the 150 eGroups employees were University of Illinois alumni.

"The valley is a very small place," said Long. "In a short time here we've made many contacts in the industry. These contacts have already been invaluable for advice and to help get our foot in the door to demo our product."

Long and Jeske both live and work in San Francisco. Long enjoys ice hockey, mountain biking, and skiing. Jeske is continuing his long-term work on a real-time strategy game based on Herzog Zwei and enjoys motorcycling, SCUBA diving, and playing Go. ◼

www.neotonic.com

New Siebel Scholars

Graduate students Bhaskar Borthakur, Albert Chu, Hui Fang, James Jackson, and Ryan Szyposki received the 2001 Siebel Scholars award for their outstanding work in computer science. Awardees from 11 universities attended the second annual gathering of Siebel Scholars in November 2001 in Cambridge, Mass. This year's conference focused on the the threat of global terrorism and crisis management. Panel participants included former Israeli Prime Minister Benjamin Netanyahu; General Norman H. Schwarzkopf, who was responsible for planning and executing Operation Desert Storm; William Gavin, former assistant director of the New York FBI; Dr. Jerry Linenger, who spent five months aboard Russia's MIR space station; Scott O'Grady, who was shot down over Bosnia while helping to establish the NATO no-fly zone; Kurt Muse, the only American hostage ever rescued from Noriega's infamous Modelo Prison in Panama; and Denny Fitch, the United Airlines pilot and trainer who helped crash land a DC-10 in a cornfield in Sioux City, Ia. The Siebel Scholars program was established by Tom Siebel, MS 85, to recognize top graduate students in computer science and business. Awardees received $25,000 for their second year of graduate school. ◼

years at Hebrew University before joining IBM's theory group at T. J. Watson in 1986.

After six years working on algorithms and programming models, Snir moved to a group that was designing a parallel computer. IBM was thinking seriously about commercializing some of the ideas that came from research on large-scale parallel computers. Until then, these machines were considered too exotic to become real products, and IBM's focus was squarely on mainframes as the solution for high-end computing problems. At the same time, RISC-based parallel machines, like the IBM RS 6000, were just appearing on the market and were providing useful building blocks for scalable parallel systems. Snir's group was charged with converting research ideas into development of an actual product. The result was the IBM SP, the most successful series in supercomputing history.

Snir has been involved with the ASCI initiative, which marked another chance to interact with researchers at Illinois. ASCI is the Accelerated Strategic Computing Initiative, a DOE effort to address the aging stockpile of nuclear weapons in an era of no nuclear testing. This cooperative effort involves three defense program laboratories (Los Alamos, Sandia, and Lawrence Livermore) as well as alliances with several universities and corporations, including Illinois and IBM. The manifestation of ASCI at Illinois is the Center for Simulation of Advanced Rockets (CSAR), under the direction of Professor Mike Heath. For past two years, Snir has served on CSAR's external advisory committee.

After SP, Snir headed the system activity for the Blue Gene project. Blue Gene aims to be the world's first petaflop machine, whose task will be to simulate the extremely complex problem of protein folding. (Blue Gene's designer is Monty Denneau, MS 78, PhD Math 78, one of many Illinois alumni Snir has worked with at IBM.) This would be Snir's last role as an IBM employee.

So really, Snir is no stranger to Illinois. Over the years, he has attended the Allerton Conference on Communication Control, and Computing, given talks, and collaborated with people at CSRD (Center for Supercomputing Research and Development) and CSL (Coordinated Science Laboratory). In addition to CSAR, he has also served on the external advisory committee for Klaus Schulten's theoretical biophysics group at the Beckman Institute.

Snir's experience is sure to affect the department's relationship with industry. "It's an interesting issue," he said. "What is the natural stream of ideas and technologies from academia to industry? If you work in an engineering discipline—and computer science by and large *is* an engineering discipline—then the ultimate

measure of what you do is whether it is eventually used by engineers that are building things. So in some sense, the transfer of our know-how to industry is the ultimate measure of success. Now this transfer does not need to be direct in the sense that we sell our ideas or patents. The main way this transfer is done is through education—students who are educated by academia who go to industry and do useful things. That is probably the main mission of academia, and University of Illinois has certainly done its share on that account.

"Then there is the more direct transfer of ideas and technology from academia to industry," he continued, "and the debate, which has been and will continue forever, is: what of the technology that academia has developed should be in the open and available for free? More direct relations with industry may involve restrictions on the free dissemination of ideas. That's a vexing issue for which I don't think there are easy answers. The purpose of academia has to be the free dissemination of ideas and technologies that are available to all. On the other hand, when technologies that come out of universities have immediate applicability, sometimes the only way to move them quickly into use is to have exclusive arrangements or licensing with industry because industry may not invest in the technology if anyone can copy it without constraints. There is no easy answer to how to manage this conflict."

Snir is keenly aware of the risk of becoming irrelevant by being too far removed from fast-moving technologies embraced by industry. "A lot of my friends in industry would claim that academic research these days is much less relevant to industrial products than it was 10 to 20 years ago. It is worrisome if the intellectual ascendancy of academia is not acknowledged by advanced technology companies in our discipline," he said.

Snir has readily adapted to academic life. "What has been surprising, perhaps, is how quickly I moved from having an easy unloaded agenda to working my usual 60 hours or so a week," he said. "That has happened within two weeks. I expected the transition to be a little less abrupt, but okay, that's fine. People in the department are very helpful and very willing to work toward a common good."

Snir, his wife Avigail, and daughters Anat and Batia, already appreciate the special qualities of living in a college town, with its variety of people and activities. "It seemed like an opportunity to have a richer life, intellectually and socially," he said. "People here are very helpful and very friendly. So far it has been quite pleasant." ∎

Faculty Notes

Shang-Hua Teng will join the computer science faculty at Boston U as a full professor in January 2002. He will continue as senior research scientist at Akamai and visiting professor at MIT. Teng has been in Boston for the past 2 years, commuting to UI to teach and advise students.

Gul Agha was elected an IEEE Fellow for his contributions to the theory and practice of concurrent programming. He joins three other IEEE Fellows in the department—David Padua, Lui Sha, and Marc Snir.

Jeff Erickson and **Vikram Adve** have won NSF CAREER awards for 2001. This is NSF's most prestigious honor for junior faculty members.

John Hart recently received ITR grants for two 5-year projects: one to port scientific algorithms to graphics cards and another to help scientists visualize large CDF datasets, such as those resulting from simulations of the Osprey tilt-rotor aircraft.

Dan Roth won the Innovative Applications of AI Award from AAAI, with former students Andrew Carlson, BS 01, and Jeff Rosen, MS 99, for their work on context sensitive spelling correction. Rosen now works for Siebel Systems.

Paul Saylor, and eleven co-PIs, including **Ralph Johnson**, Joerg Liesen and **Eric de Sturler**, have been funded to develop an interoperable based environment for high performance computing, with applications to modeling Gamma Ray Bursts.

David Padua and **Jerry DeJong** received an ITR grant to develop a methodology to design the optimization component of a compiler that learns from experience.

Vikram Adve co-authored the Best Paper Award at the Symposium on Parallel and Distributed Simulation, May 2001. Coauthors were Ewa Deelman and Rajive Bagrodia of UCLA and Rizos Sakellarious of U of Manchester. The paper was called "Improving Lookahead in Parallel Discrete Event Simulations on Large-Scale Applications using Compiler Analysis."

Josep Torrellas and **Laxmikant V. Kale**, in collaboration with biochemists and biophysicists from Indiana U, NYU, Princeton, and Penn, received an ITR grant to develop novel, scalable simulation techniques and computer architecture concepts for chemistry, materials science, and biology. ∎

Classnotes

Clarence A. "Skip" Ellis, MS Math 66, PhD 70, is the country's first African-American to earn a PhD in computer science. He worked on ILLIAC IV before joining Bell Labs and later XeroxPARC. He is now professor of computer science at U Colorado in Boulder.

Robert Horst, MS EE 78, PhD 91, VP of R&D for 3ware, which develops high performance switched storage systems. Before that, he was a technical director at Tandem, where he led the architecture team that developed the ServerNet System Area Network. He also contributed to their fault-tolerant parallel computer systems. He is an IEEE Fellow and holds 44 U.S. patents.

Doug Jones, MS 76, PhD 80, testified on the problems raised by computerized voting systems at the U.S. Civil Rights Commission hearings about the irregularities in the last presidential election, held in Tallahassee in January 2001. He has served on the Iowa Board of Examiners for Voting Machines and Electronic Voting Systems since 1994, and he now chairs that board. He will be teaching a course on computers in elections next fall at the University of Iowa, where he has served on the faculty since 1980.

Ray Ozzie, BS 79, was named the 2000 recipient of the W. Wallace McDowell Award from IEEE for his contribution to the advancement of collaborative computing. Ozzie is founder, chairman, and CEO of Groove Networks, which produces a collaborative software platform. He is best known for creating Lotus Notes.

Roy Rada, PhD 81, is professor of health care information systems at the U of Maryland. An MD, Rada's specialty is HIPAA (Health Insurance Portability and Accountability Act of 1996). He is an ACM Fellow, has been editor of *Index Medicus,* a chief at the National Library of Medicine, project leader for the European community in standardization of its medical informatics vocabulare, and the Boeing Distinguished Professor of Software Engineering.

Keith Tookey, MS 81, is associate professor of computer science at Eureka College, in Eureka, Ill., where he has been since 1998. His specialty is educational applications of comptuers.

Ron Cytron, MS 82, PhD 84, has been named editor-in-chief of *Transactions on Programming Languages and Systems,* a bimonthly journal published by ACM. Cytron is an associate professor of computer science at Washington U in St. Louis.

Carol L. (Freund) Barns, BS 83, BA Phil 83, has been admitted to practice before the U.S. Patent and Trademark Office as a registered patent attorney. She concentrates her law practice on corporate and intellectual property transactions. Base camp for family bicycling and kayaking adventures for Carol and her husband Robert, son David (13), and daugher Dianna (11) is Palatine, Ill.

Cynthia Tao, BS 83, BA Phil 83, works at the IBM Industry Solutions Lab in Hawthorne, N.Y., where she is responsible for bringing in and managing content for CRM demonstrations and supporting CRM briefings in the lab. She met her husband, Paolo Aloe, while on assignment with IBM in Rome, Italy. They have a 5-year old son, Luca.

Chandrika Kamath, MS 84, PhD 86, is a computer scientist at the Center for Applied Scientific Computing at Lawrence Livermore National Lab, where she leads the Sapphire project in large-scale scientific data mining. Before that she was a software engineer at DEC, where she developed high performance mathematical software for DEC Alpha systems.

Charley Kline, BS 84, MS 86, and Kate Hellenga, a PhD candidate in clinical-community psychology at UI, were married in September 2001 on

Olympian Karen Brems Kurreck

On September 1, 2001, Karen Brems Kurreck was inducted into the Tribute to Olympic Athletes at Dodds Park in Champaign, where her name was inscribed in granite next to 28 other Champaign County Olympians. She competed in the 2000 Olympics as a member of the cycling team. A former world champion, she has retired from competition and works as a software engineer for Atomz, in San Bruno, Calif. She graduated from CS in 1984 as a Bronze Tablet scholar. ◻

Karen Kurreck

Block Island, R.I. Kline is principal research programmer for CCSO at U of I and is best known for being the architect of the campus data/voice network.

Todd Brandt, BS 85, and his wife Karen, had a baby girl, Erika Jane, in September 2000.

Stan Krolikoski, PhD 85, is VP of business operations at Cadence Design Systems in San Jose, Calif. Previously he held the positions of VP of marketing and senior architect at Cadence, and senior fellow and chief technologist at Compass Design Automation. He has been head of several itnernational organizations including the IEEE group that developed the VHDL language. He currently chairs the Board of the Open SystemC Intitiative. He lives in San Ramon, Calif., with his wife of 28 years, Greta, and two children, David (13) and Mia (11).

Andrew Grimshaw, MS 86, PhD 89, was elected to the Peer-to-Peer Working Group. The group is an industry consortium focused on developing and advancing infrastructure standards for peer-to-peer computing. He is founder and CTO of Avaki Corp., in Cambridge, Mass., a supplier of software for grid computing. He continues as professor of computer science and director of the Institute of Parallel Computation at U of Virginia.

Phil Roberts, MS 86, is director of mobile network architecture for Megisto Systems, a developer of carrier-class mobile Internet infrastructure equipment based in Germantown, Md. Before joining Megisto, he was manager of mobile infrastructure network architecture at Motorola and also worked at Bell Labs.

Kevin McFall, BS 89, is director of enterprise application develoment for Tribune Company's media services group. Previously, he was president of The Urban Technologists, an IT consulting firm he co-founded with Delbert Sims, BS ME 89.

Kent Steffen, BS 89, is president and CEO of Telution, a Chicago-based consulting company serving the communications industry. Before co-founding Telution in 1998, Steffen spent 10 years at Andersen Consulting.

Taed Nelson, MCS 91, and his wife Suzanne Wynn, had a baby boy, Keb, in May 2001. They are now the Wynnell (Wynn+Nelson) family. Taed is a network engineer for Vertical Networks, in Sunnyvale, Calif.

Mark Rendina, BS 92, completed an MS in medical informatics at UNC and is currently a doctoral candidate in the department of health policy at the UNC School of Public Health. In conjunction with groups such as the Computer Professionals for Social Responsibility and Electronic Privacy Information Center, he has advocated for free speech on the Internet and for privacy legislation to protect confidentiality of medical records and consumer information. He works in the information systems department at UNC Hospitals and also runs Rendina Solutions, an intellectual property consulting firm. He has finished an Ironman triathlon and married Julanne Falco in 1997.

Marc Henkel, BS 94, was married to Kathleen Evans, BS Journ 99, in May 2001. He works at UI as assistant director of business systems analysis in the office of banking and investment services.

Andrew Hyatt, BS 95, MS Psych 98, is a software engineer for Intraspect Software in Los Altos, Calif. He was one of six St. Louis natives who were gathered in March 2001 by the *Post-Dispatch* to discuss the city's future.

Jason Lindquist, BS EE 96, attended no less than three CS alumni weddings in August 2001: **Joe Gross**, BS 96, and Lorah McArdle, BA Rhet 00; **Jay Kreibich**, BS 96, and Debbie Fligor, BS EE 91, who both work for CCSO at UI; and **Keith Garner**, BS 97, and Sarah Shockley, BS Accy 98. CS alums in Garner's wedding party were **Vik Adukia**, BS 00, and **Mark Notarus**, BS 96. CompE alums were Chris Stamborski, BS 98 and Brian White, BS 99, and other alums were Leah Dicker, BS 95, EDM 98, and Jason Beatty, BS 97.

Captain Antony Haynes, MS 97, is an instructor of computer science at the U.S. Air Force Academy in Colorado.

Norman Murrin, BS 97, was married to Amy Reider, BS BusAdmin 98, in August 2000. They live in Chicago.

Jeffrey Wall, BS 98, and Krista (Kolaz) Wall, BS CivE 98, had a son, Lucas Jeffrey, in May 2000. Jeffrey is a software design engineer with Microsoft in Redmond, Wash.

Tony Zale, BS 99, has left Jellyvision and joined NuFX, in Hoffman Estates, Ill., doing develoment for console video game systems.

Roland Geisler, MS 00, left his role as product manager for Gigbeat after the company merged with Napster. He is now a project manager with Nokia, in Helsinki, Finland, implementing software for mobile phones.

John Borden, MCS 01, was married to Mindy Zehner in June 2001. He is employed by Ernst & Young in Chicago. ▫

It's big, it's loud, and it's cool!
Powerful piledriver at work on Siebel Center

An auger is used to dig pilot holes and loosen the soil before beginning piledriving.

Interlocking 50-ft steel pilings are vibration-driven into the soil prior to excavation.

This Sennebogen piledriver, one of two in the country, is a vibration and hydraulic ram being used to drive 50-ft sections of sheet-piling into the Siebel Center construction site for building excavation. Construction is on schedule, and the big move will take place in 2003. Check out the progress live on the Web by using our Webcam, perched atop one of WILL's towers adjacent to the site. Link to it from our home page. ◼

DEPARTMENT OF COMPUTER SCIENCE

University of Illinois
at Urbana-Champaign
1304 West Springfield Avenue
Urbana, IL 61801