Three extraordinary gifts for Computer Science

The Larry White Chair

Larry White, BS'75, MS'75, has established the the Larry White Chair in Computer Science. This endowed faculty position will allow the department to honor outstanding scholarly achievement among the world's top computer scientists. An endowed chair is the highest honor the university can bestow upon its faculty members, and the Larry White Chair is the department's first.
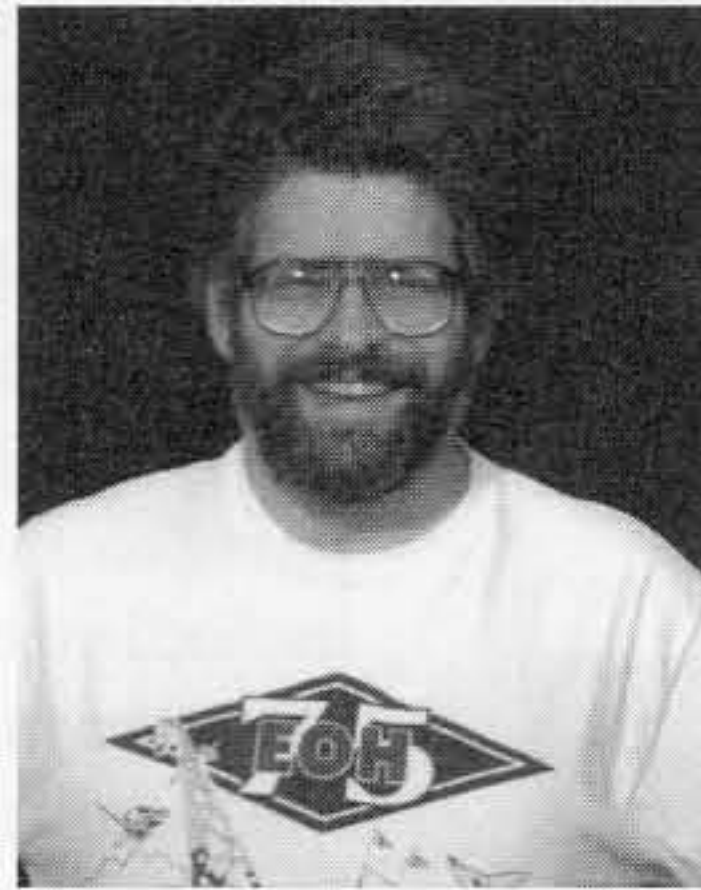
Larry White

White has been heavily involved in UIUC computer activities over the years. As a student, he was a system programmer on PLATO for four years in the mid 1970s. A decade later, as a UIUC staff member, he started the workstation development group within NCSA. White has now been at Microsoft for more than 10 years, where he

The Michael Faiman and Saburo Muroga Professorship

Doug MacGregor, MS'80, has established the Michael Faiman and Saburo Muroga Professorship in Computer Science to recognize the significant recognition of an outstanding faculty member. MacGregor named his professorship in honor of professors Faiman and Muroga for their service and dedication to students as manifested through their exemplary teaching and guidance.
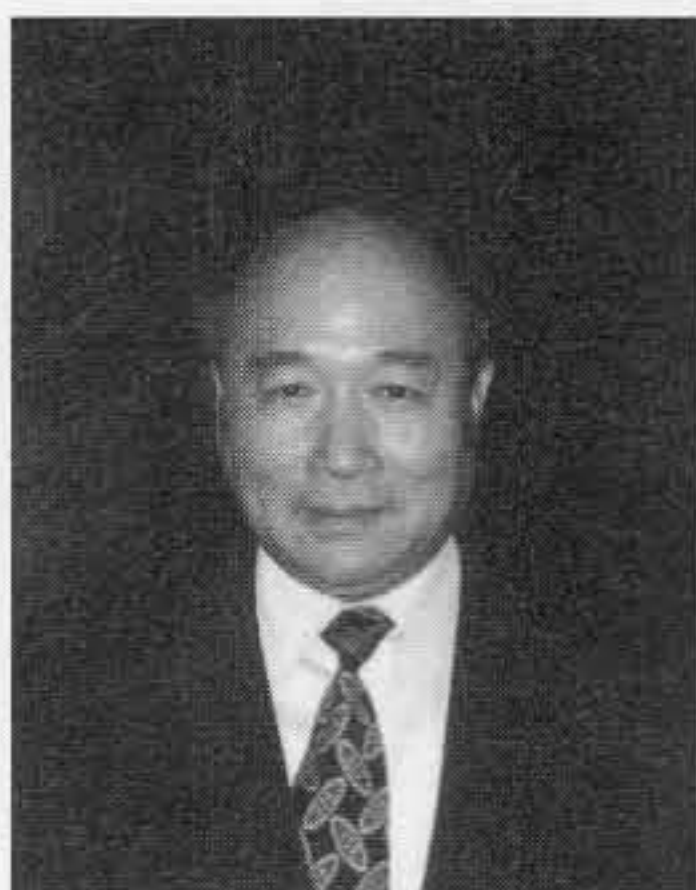
Doug MacGregor is currently part of the Global Leadership Initiative. An initiative within the Harvard Business School focused on increasing the level and quality of leadership at all levels of organizations. After earning
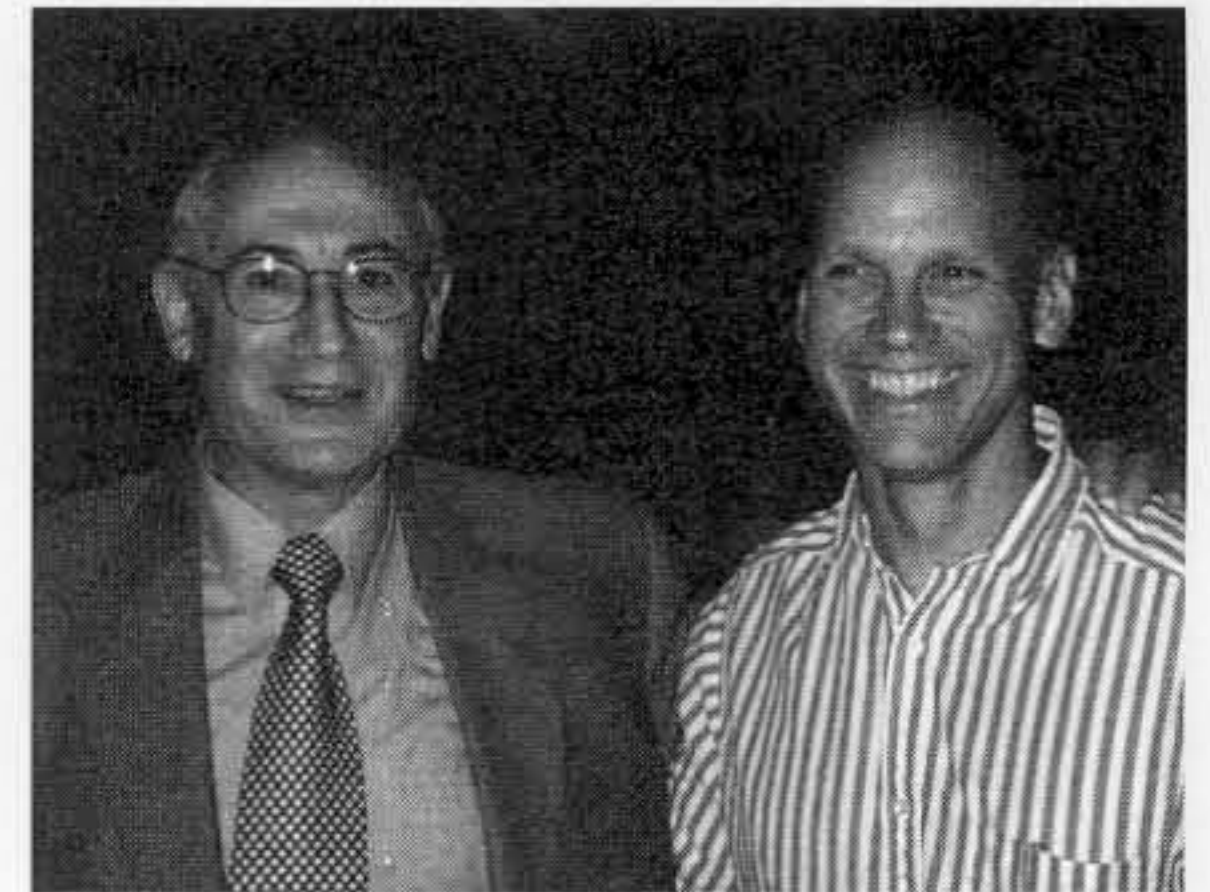
Mike Faiman and Doug MacGregor

The Richard T. Cheng Fellowship

Richard Cheng

Richard T. Cheng, MS'69, PhD'71, has established the Richard T. Cheng Fellowship in Computer Science. With this fellowship, the department can recruit and retain exceptional graduate students. It is the second fellowship in the department.

Richard Cheng has served on the Computer Science Alumni Board and has been an important benefactor of the department. It was Cheng's generous gift to the W. J. Poppelbaum memorial fund that allowed the Poppelbaum Award to be given to a graduate student for the first time in 1997.

Richard Cheng is chairman and founder of ECI Systems and Engineering, a company devoted to computer, network, telecommunications, and firearms simulation training technology. He founded the company to market technology he developed to generate Chinese characters using a standard 26-character keyboard. Cheng has also been active in academia, helping develop computer science programs at the University of Wisconsin–Whitewater, Hunter College, Rochester Institute of Technology, and Old Dominion University.

Cheng explained, "While I was a student at the University of Illinois 30 years ago, I received an assistantship and fellowship that enabled me to complete my education. I feel the best way for me to express my gratitude today is by establishing a graduate fellowship in computer science at the university, and in a small way, help the university continue helping future students to achieve their goals."

Sarita Adve

Vikram Adve

Eric de Sturler

Michael Garland

Robin Kravets

New professors join department

The CS department was pleased to welcome five new faculty members this fall.

Sarita Adve (PhD, University of Wisconsin–Madison) came from Rice University, where she was an associate professor. Her research interests are in computer architecture, parallel computing, and performance evaluation.

Vikram Adve (PhD, University of Wisconsin–Madison) came from Rice University where he was a research scientist. His research involves developing compiler echnology to simplify the development of high-performance parallel and distributed programs, including compiler techniques for automatic parallelization, performance evaluation, and performance prediction. He is beginning to explore compiler support for highly dynamic, networked computing environments.

Eric de Sturler (PhD, Delft University of Technology) has been at the Center for Simulation of Advanced Rockets for the last year as a senior research scientist. His research area is in computational science and engineering.

Michael Garland came directly to the department after earning his PhD from Carnegie Mellon University. He does research in computer graphics, specifically the automatic simplification of polygonal surface models and the application of automatic simplification to the problem of multi-resolution modeling.

Robin Kravets (PhD, Georgia Institute of Technology) conducts research in the areas of networking and operating systems as applied to wireless and mobile computing and communications.

From the corner office

As I write this, the "corner office" is filled with building contractors who are renovating and expanding the department's administrative offices. No, it's not another case of administrative overhead growing faster than the faculty and technical staff! Rather, it's due to recent successes and the rapid growth of our research and teaching activities.

On the education side, we now have over 1,100 undergraduates and nearly 400 graduate students. However, the real story is not about numbers, it's about quality. Because the undergraduate admission standards for computer science are the highest on the UIUC campus, our student body is not only large, it is extraordinarily talented. One can see that quality in the classroom, in student participation in faculty and independent research projects, and in the enthusiasm of corporate recruiters for UIUC graduates.

As associate head W. J. Kubitz describes elsewhere in this issue of *Alumni News*, we have also launched an ambitious distance learning program, delivering courses for a professional master's degree to individuals, corporations, and an India-based program. An outgrowth of faculty research on streaming multimedia, this program is changing the ways we teach on campus and expanding the educational reach of UIUC throughout the world.

Recent research developments are just as exciting. The department recently received a $2M National Science Foundation (NSF) infrastructure grant to prototype "smart spaces" —intelligent offices and mobile information spaces that adapt automatically to changing user behavior and needs. As part of this effort, and in collaboration with the National Center for Supercomputing Applications (NCSA), we are constructing a prototype "conference room of the future." This room contains an 8'x24' video display wall, driven by a PC cluster and disk archive, intelligent white boards, responsive lights and conference tables, mobile and wearable computers, wireless networks, and smart badge access. Using this prototype, we are exploring the software and hardware needed to create the next generation of intelligent information spaces.

As alumni, we are proud of all your successes, just as we hope you are proud of the fact that this is one of the best CS departments in the country. However, like you, we strive every day to become better— we are not content to be just one of the best departments; we are committed to being the very best in the world. Equally importantly, the UIUC campus is committed to helping us make this goal a reality.

Dan Reed

This fall, five new faculty members, Sarita Adve, Vikram Adve, Eric de Sturler, Michael Garland, and Robin Kravets joined the department, bringing new strengths to our multimedia, graphics, and high-performance computing research groups. Over the next five years, we will continue to hire new faculty members, with a targeted goal of 60–65 professors who combine world-class research with an unwavering commitment to educational excellence.

Reflecting our history of excellence, this spring we will be celebrating the 50th anniversary of the founding of the Digital Computer Laboratory (DCL), the precursor to the department. Watch our Web site and the Alumni News for details.

Nationally, there is also good news for computing research. The Presidential Information Technology Advisory Commission (PITAC) recommended, the Congress appropriated, and the President approved, major new funding for long-term computing research. Over the next five years, federal investment in computing research will double.

In short, as computer scientists, we live in very exciting times. Amazing things are happening, but we all know that even more amazing things await us all.

Dream big and reach high!

—*Dan*

U.S. News puts us near top

Once again, the department's PhD program was highly ranked by *U.S. News & World Report* for 1999. Topping the list were MIT and Stanford (tied for first), followed by CMU and UC-Berkeley (tied), and UIUC (tied with Cornell). Our program was also rated in the top ten in three of six categories: artficial intelligence, seventh; databases, sixth; and software, sixth. The other three areas were graphics, hardware, and theory.

http://www.usnews.com/usnews/edu/beyond/gradrank/gbcompsc.htm

Masters of the Internet
The new world of Internet education

by Bill Kubitz, associate head

The Department of Computer Science at the University of Illinois has been offering regular graduate-level, on-campus courses to off-campus students via the Internet using streaming video for the course lectures for almost two years now. Our program is called the IMCS Program, and sufficient courses are offered that qualified students can take nine courses to obtain the Master of Computer Science professional degree. It has already been an interesting and exciting "trip" on a voyage that has barely begun. The growth in the program over six semesters has been from 2 to 160 "enrollments" (one student in one course) per semester. The students are a mix of both degree and nondegree students. The nondegree students are a mix of credit and noncredit students. The clientele are primarily of two sorts, people already in the computing workforce ("corporate clients") wishing to learn more about various subjects and students with little computing background wishing to transition into the computing workforce.

The program began at a site in India in January 1998 and was extended worldwide in January 1999 when we began direct Internet delivery to anyone on planet Earth. There are myriad aspects to this method of delivering education. While much of what one reads about it emphasizes the difficulties of this sort of delivery, there are, in reality, some terrific advantages.

Convenience: It is time flexible for busy people or those who have a conflict. We have already had IMCS students who have kept up with their courses while they traveled the world on business. We even determined a way for a student to take an exam in another country while traveling! Some current on-campus students have been able to take a course they wanted or needed in spite of conflicts with another required course. We have had a regular on-campus student take a course during the summer that allowed him to take a more advanced course the following fall rather than having to wait a semester. In the case of our delivery to India, students there have access to courses from one of the top CS departments in the world that would otherwise be inaccessible. We have already had seven MCS graduates in India, and there will be some 7–10 more each semester at the current rate.

Another aspect of convenience is associated with the on-line lectures. Students may review the video lectures as many times as they wish and at any time, whether in the middle of the semester or before final exams. Because the lecture topics are randomly accessible, they can simply go directly to the topic of interest. We have already had a request to make available the lectures from previous semesters. This would allow students to see not only what the current professor has to say on a given subject but also see what other professors said about it. In the long run, this could be professors anywhere in the world, in

Bill Kubitz

principle. It is no longer necessary to find a substitute when the professor has to miss the lecture; it is simply prepared in advance. It is no longer possible for students to miss a lecture. They simply watch it after it is posted to the server. Professors worry that it is no longer necessary for students to come to class, unless there is an exam, of course. Our own experience is that students have always made a choice of whether or not to come to class; some do and some don't. Perhaps now those who don't will get curious and take a look at the lectures! Of course, why not require the students to watch the lectures *before* they come to class. The class period could then be devoted to a question-and-answer session about the material, the way small classes more commonly function.

Learning: It is pretty well known to us "old timers" that many students learn as much or more directly from other students as they do from us. Most of the learning actually takes place outside of the classroom. Informal student study groups are common. In our own situation, our classes tend to be large, and the larger the class the fewer the students who will ask questions. One of the great things about electronic discussion groups is that even the timid will ask questions because of the strange electronic anonymity provided by the lack of physical presence. This is a tremendous advantage for quieter students, and I would imagine they do better in this sort of environment. It is also better for those less inclined to be a part of a study group for the same reason.

Experience, Practice, and Connections: One of the most fascinating aspects of worldwide remote education, especially in our model which mixes on- and off-campus students in the same class, is the additional dimensionality it brings to the classroom experience. Our advanced

undergraduate/graduate courses already mix undergraduate students with graduate students. The new world of on-line education expands this mix by adding graduate students from around the world. These additional students are themselves a mix of experienced computing practitioners and novices. These students all share a course bulletin board for communication with one another, along with email. This international melange works together to understand the course material. Things become even more interesting in the courses that require team projects. The careful faculty member makes sure to assign team members to ensure a mix of all of the above backgrounds in a reasonably balanced way. This can produce a software development team consisting of members whose experience ranges from novice undergraduate to corporate software development manager. Imagine the learning experience in this environment in contrast to an all-novice group struggling to define and implement their project. And the technical experience is not the only relevant one here. It is now common for workers in the software industry to telecommute, and it is also common for teams on software projects to be international. The shortage of qualified people in the United States and lower cost have encouraged companies to establish facilities all over the world. In fact, many companies have installations in India, where there is also a growing shortage of highly educated IT workers. Another natural consequence of the teaming is that the corporate participants will get to know the best up-and-coming team members and can begin recruiting them on the spot.

Cost: At this time, the cost of offering courses this way is on the high side because of the additional technology costs. But the truth is that on-campus courses are inexorably moving to adopt most of these technologies. As time goes on, there will be little difference between on- and off-campus courses in cost or delivery, at least at large institutions like ours. Even though the Internet courses are currently quite expensive, they are generally far cheaper than the cost of coming on campus to earn a degree. The combination of quality and convenience balanced against cost makes them very cost effective.

Our own situation is that our program is operational and growing, and our current emphasis is on enhancing the quality of all aspects of the experience. Technology continues to change, and although we are a long way from having the tools we all know are possible, there is no doubt that such tools are possible and will soon be with us.

www.cs.uiuc.edu/education/grad/degrees/imcs

White Chair, continued from page 1

has worked in the Exchange Server and SQL Server groups in a variety of development positions. He often has taken time away from Microsoft to return to campus, a couple of years ago for the PLATO reunion held during Cyberfest in 1997, and this year as part of the annual College of Engineering Advisory Board meeting.

Recently asked why he chose to support the Department of Computer Science, White responded "I'm very lucky to live in an age where software development skills are greatly in demand. This is my way of giving something back to the department, the college, and the state which 25 years ago provided me with such a tremendous environment in which to grow these skills. I hope that my contribution will help create opportunities at the University of Illinois for generations of future students to grow in a similarly challenging environment."

Faiman-Muroga Professorship,

his MS at Illinois, he joined Motorola, where he did design work for the 68010 and 68020 microprocessors. After that, he went to Kyoto University, where he earned his PhD in information science and worked for Matsushita before starting his own company, Solbourne Computer, Inc., a maker of UNIX-based computers. He then led the hardware development at Data General before joining Dell

Saburo Muroga

Computer in 1993. At Dell, he led the portable business unit, procurement, and the desktop business.

Said MacGregor, "I am so appreciative of the impact that great teachers have had on my life, that I wanted to create some recognition of the importance of teaching and guiding students. Professors Faiman and Muroga had a profound impact on whatever success I was able to attain and for that reason, I wanted to recognize what they had given. The academic world sometimes appears too focused on research, and while it is important, I believe that the greatest impact of a university is from its students, and thus, those who touch the lives of their students and help them learn and find their way in life play a vital role. I know that there are many others who give a great deal to students and are dedicated to teaching. This professorship is my attempt to recognize and help support them."

SIR EDMUND HILLARY, AND HIS SHERPA GUIDE, TENSING NORGAY, CLIMBING MT. EVEREST

THERE'S NO LIMIT TO HOW HIGH YOU CAN CLIMB, ONCE YOU CHOOSE THE RIGHT COMPANY.

(AND OURS WAS JUST NAMED ONE OF THE BEST TO WORK FOR.*)

As you prepare to embark on your career journey from the University of Illinois, you approach it with your own unique set of skills. Skills that provide you with a world of opportunities. Skills that present you with a tough decision: determining which company will enable you to develop your talents to their fullest.

Before you make your decision, we ask you to consider Lante. For the past 15 years, Lante has been on the cutting edge of e-commerce, developing high-impact .com businesses for some of the most innovative and forward-thinking companies in the world. We not only know where e-commerce has been; we are leading it into the future.

At Lante, we offer an exciting, fast-paced environment that will bring new challenges each and every day. Your colleagues will be some of the Internet world's leading experts on technology, business strategy and customer experience. So as you head off on that search for the perfect job, ask yourself one question: Who do you want at your side as you begin the adventure of a lifetime?
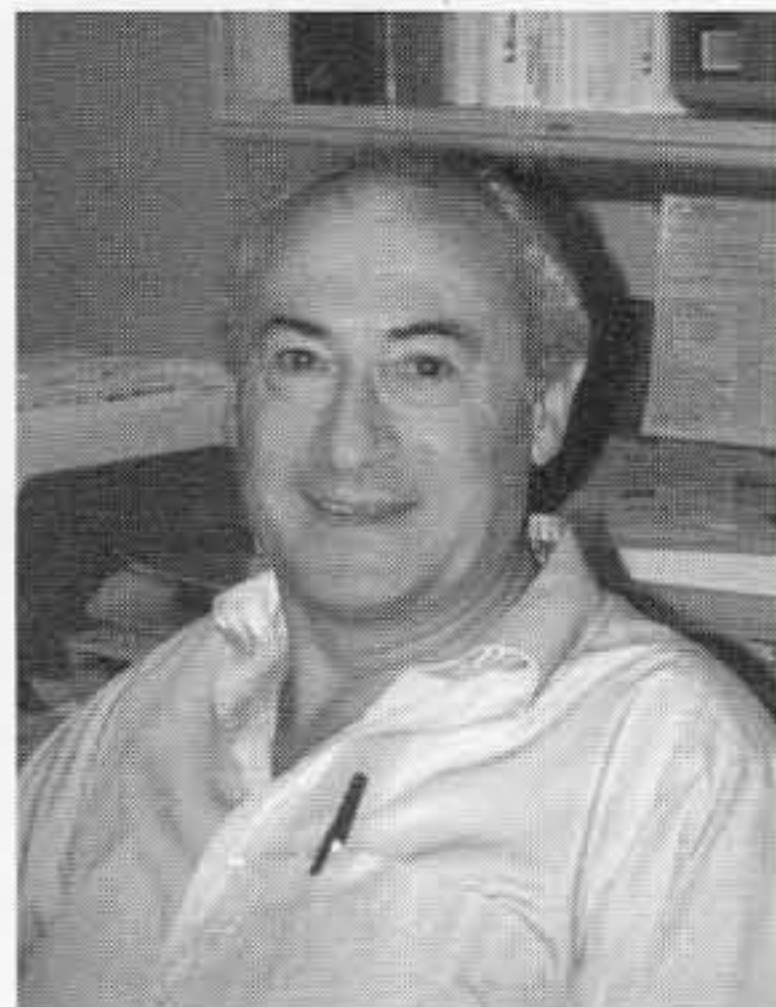
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Professor Mike Faiman retires

Mike Faiman

MIKE FAIMAN, MS'64, PhD'66, has been with the department for 39 years. He worked on the design and construction of ILLIAC II and established the department's first instructional hardware laboratories. His research included graphical processing, device theory, circuit design, logic design, and networks. He is especially noted for his teaching and advising, particularly his teaching of computer architecture and his advising of countless graduate students as director of graduate programs.

Faiman began his computing career in England in the 1950s. After he earned his BS in physics from Cambridge University, he joined the microwave division at Elliot Brothers and worked on radar-related projects before switching to the company's computer division, where he helped design the Elliot 803 computer. In 1958, Elliot had hired Ted Poppelbaum of UIUC as a consultant on high-speed circuits. Poppelbaum invited Faiman to come to Illinois, but Faiman was considering going to Israel.

A computer scientist at the Weizmann Institute told Faiman that if he wanted to work for them, he should consider going to the University of Illinois first. The reason was that the Weizmann Institute wanted to construct a computer similar to the new computer that was being built at Illinois, ILLIAC II. Unbeknownst to him at the time, Faiman's boss at Elliot was already planning to have Faiman go to Illinois, but not to the university. Instead, Faiman was chosen to go, on a few days' notice, to Skokie, Ill., to help train staff on the Elliot computers they were using for data logging of industrial processes. Of course, while he was in Skokie, he visited the Digital Computer Laboratory in Urbana.

Faiman's visit led to the offer of an assistantship, working full time designing ILLIAC II. He recalled the good times spent with Jim Robertson, Don Gillies, Dick Shively, John Penhollow, and Kazuhiro Fuchi at DCL. "We built ILLIAC II, and it actually worked!" Faiman remarked. Dan Slotnick invited him to work on ILLIAC IV but Faiman felt that "one big computer project was enough for any normal person," so he declined and continued working for Poppelbaum while earning his PhD in physics.

Faiman decided to devote less time to research and more to teaching and service. He revamped the digital design course and started the microprocessing course

and laboratory, equipped with Zilog Z80 machines with 5 ⌣-inch floppy disks. He even set up a rather primitive network using a 10 MB hard disk, "a really big deal at that time." Faiman also started the logic lab, the first of its kind, in 1971.

When Bill Gear became department head, he established the position of director of graduate programs. A veteran of chairing graduate program committees since 1974, Faiman was the obvious choice for the director position. "When people think about changes in our discipline," Faiman reflected, "they think primarily of the technology. But I think also that every department head has brought a new philosophy to how the department operates. It's like an orchestra getting a new conductor. It usually takes some time for the changes to work and for people to decide whether it's going to be good or not. And if it's good then the

Mike Faiman as a new professor

orchestra, like the department, goes from strength to strength."

Looking back, Faiman most values the interaction he has had with students, in all its forms. Simply walking into a classroom to give a lecture had become a relaxing experience for him. Like most people in academia, Faiman is worried about declining graduate school enrollment of U.S. students in computer science. "This country owes its greatness to being at the forefront of technology," he said, "and it's the universities, the programs that they have been able to support, the research that they've done, and the support that they gotten from the government and related organizations that help create this greatness."
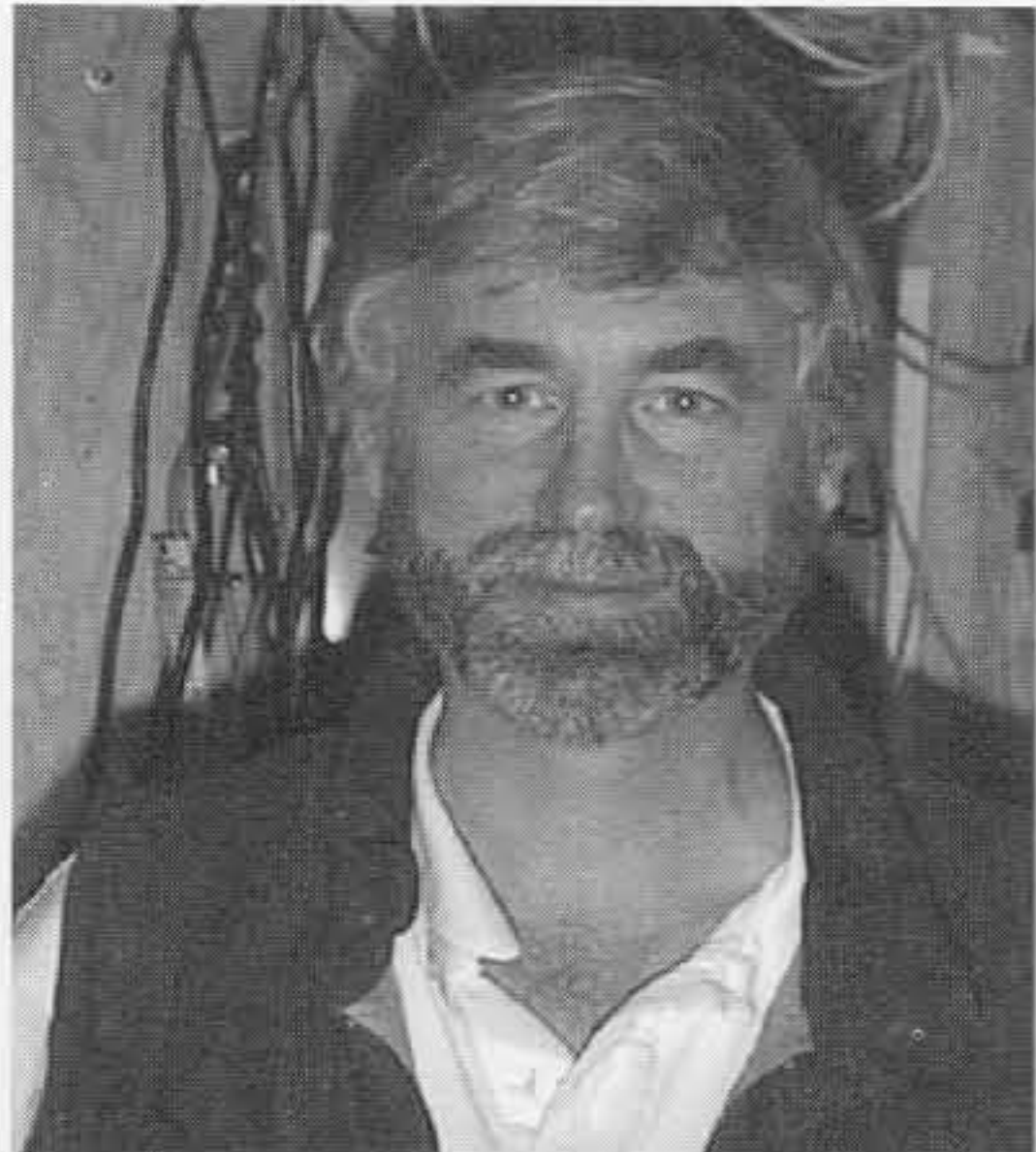
Professor Faiman retired in May 1999, but we are lucky that he has chosen to remain in the community and stay involved with the department. Faiman's wife, Lia, a biochemist, is semiretired from the university. Both their son and daughter are classical musicians living in New York.

Al Whaley: Gotta GetThere.com

Al Whaley

Al Whaley is co-founder of Internet Travel Network, the first interactive, Web-based travel agency. He spent almost 20 years at UIUC making important contributions to many of its early computing systems.

AL WHALEY, BS'74, PhD'84, and his son Dan Whaley, AB'90, are co-founders of Internet Travel Network, a pioneer in Web-based travel reservation technology. In May 1995, the company was the first to offer Web-based travel reservations, and it is now a giant among the other Internet travel technology companies that have sprung up in its wake.

Al Whaley started his undergraduate career at Illinois in 1965 in physics as an out-of-state student from a Washington, D.C., suburb. Uncertain where to direct his love of physics and cosmology, he changed to a part-time electrical and computer engineering student and began full-time work for CS professor Bill Gear. Al Whaley had been exposed to computers in a high school after-hours class taught on an IBM 1401. Gear encouraged him to take a serious look at ILLIAC II, and Whaley became involved with writing the entire timesharing system from scratch, with help on the kernel I/O system from a student, employed as a hardware diagnostics writer, named George Huszar. A follow-on system named PLORTS was later written to run on an IBM mainframe. People could dial in to these systems, use interactive programs, store files, and run software. The university's IBM System/360-75, installed in 1975, suffered from an unstable system and had to be rebooted as many as five times a day; the need for a failure-immune filing system that would work without maintenance or operator intervention inspired Al Whaley to write a new filing system called BLAM. PLORTS stood for PL/1 Remote TimeSharing, but the interactive PL/1 system co-authored with grad student James Christopher was never deployed because Whaley moved on to other projects. Looking back at the tremendous amount of time and effort all this took, Whaley remarked, "It was a lot of fun, and it was pretty rewarding, too."

Al Whaley continued in school on the "take forever" program. In addition to course work and raising his young son as a single parent, he took on even more software and hardware jobs. He worked with Gear on a huge numerical analysis system that would simulate large equation systems with as many as 2,500 variables involving stiff differential equations. This project involved around 15 students, and Whaley managed much of the software development. He built special graphics hardware and graphical front-end software. He wrote special compilers for very fast execution of floating point arithmetic. He built a multiplexor for the DEC PDP-11 and VAX 780. "The multiplexor that Al designed and built for the PDP-11 made it possible for that machine to serve far more people than would have otherwise been possible," recalled Gear. Whaley rewrote UNIX to run the kernel in multiple address spaces ("a big deal because I couldn't fit the whole expanded kernel into a PDP-11").

Gear remembers Al Whaley as "an unbelievably enthusiastic person who loved to climb into the insides of anything related to computers or anything technical. He was not afraid to tackle anything—hardware or software—while at the same time completely rebuilding the engine in his car or replacing the whole heating and air conditioning system in his house. All at the same time he was working on a degree."

After earning his PhD in 1984, Al Whaley left Illinois for California, where he did consulting work and product development. He hooked up with Greg Chesson, MS'75, PhD'77, an old school chum, in 1988. Chesson, as CTO for Silicon Graphics, was starting an internal spin-off called Protocol Engines. In 1993, Whaley led a design team to make a high-speed ATM networking chip for a networking company. "I already knew a lot of electronics and solid state physics, had done a lot of hardware, software, networking, and operating systems work, so I had a broad background. I wanted to put some of my ideas into an ATM chip." Which he did, and he used some of the money he earned to fund his next business.

By this time, 1994, his sin Dan had earned his degree in rhetoric from UIUC and was working in Oregon. Recognizing the potential of electronic commerce after Mosaic opened the World Wide Web to the masses, Dan Whaley encouraged his father to join him in starting working on e-commerce

solutions. Together they developed a general-purpose system for doing e-commerce transactions, tried it on several applications, and hit pay dirt with a Web-based restaurant delivery service. During this time, Dan had been taking Tae Kwon Do where he met Bruce Yoxsimer, who owned a travel agency and was familiar with the industry. The idea for a Web-based travel agency was born, and the three of them put together a business plan. In June 1995, from the Whaley house in Palo Alto, they launched the first interactive booking engine on the Web, Internet Travel Network. Faced with the demands of working on automation for a $500 million market, the food delivery service was dropped.

Key to ITN's success was convincing the Apollo Computer Reservation System to allow the millions of requests that ITN would potentially send to their system. "They gulped a few times," Al Whaley recalled, "and said okay. This enabled us to make a business." That fall, ITN put 10,000 travel agencies in 20 countries on line. ITN was one of those rare Internet businesses that was profitable before it was funded (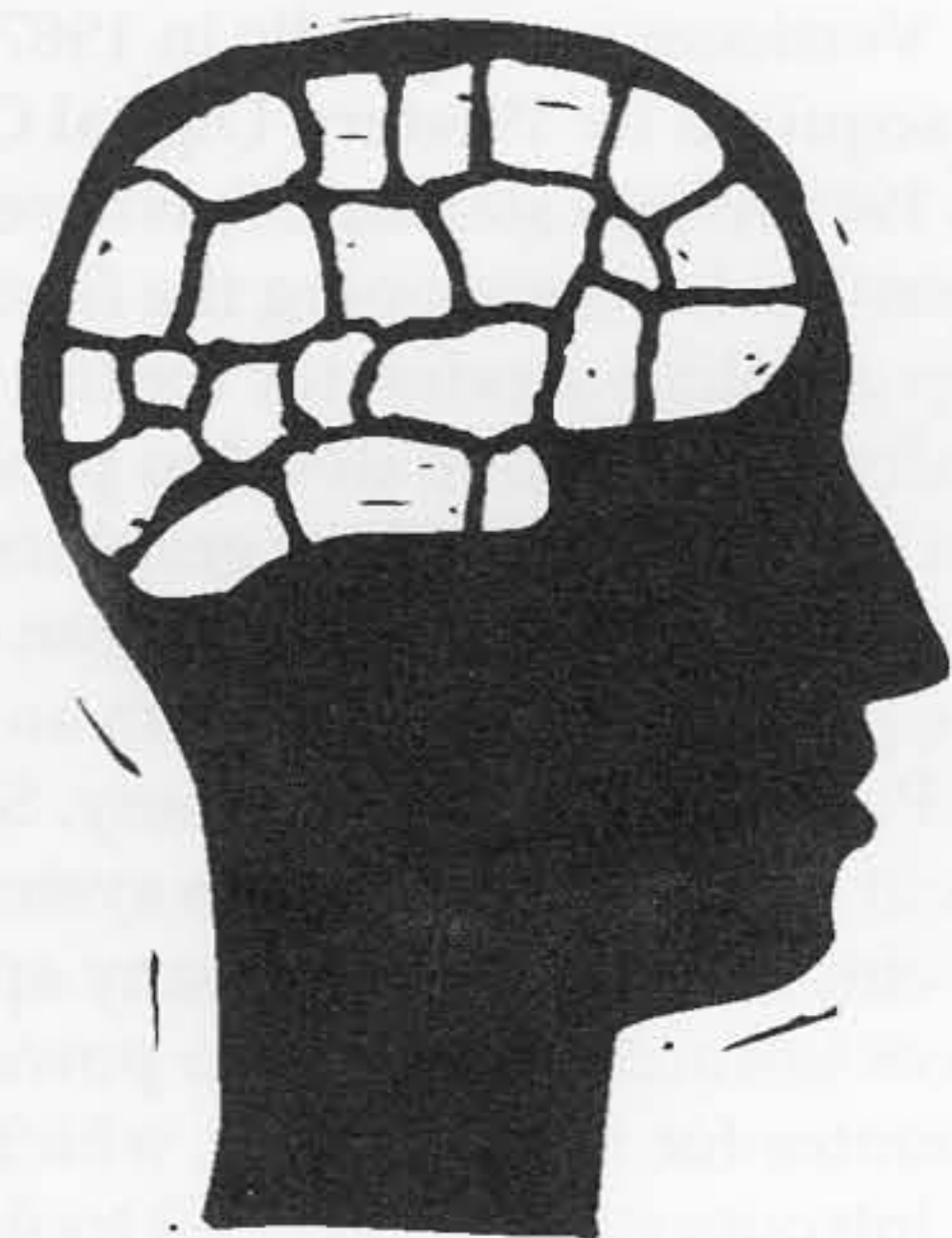1996). This fall, ITN, now renamed GetThere.com, will employ about 225 people, most located in a 68,000 square-foot Menlo Park facility. "We grew slowly and intelligently," said Al Whaley. "Because we were two years ahead of everyone else, we have a large customer base. Millions of people use ITN on a regular basis, including average folks. The big problem at the beginning was attracting enough customers. One big break came in 1995 when americanexpress.com chose ITN for the travel booking part of their Web site." (This was taken over by Microsoft in 1997. American Express and ITN have just announced renewed agreements focused on business travel solutions for large companies.) More than 150 businesses use ITN, including UAL.com, CNN.com, Nike, Proctor & Gamble, and Rand McNally. ITN is focused primarily on solutions for airlines, corporations, and large leisure travel suppliers.

ITN hired an experienced executive team earlier this year, and Al Whaley is gradually phasing out his involvement. Together, he and Dan look forward to the company's upcoming IPO.

Jackson Hu: SiRF's up!

Jackson Hu

Jackson Hu is leading SiRF in the explosively growing field of GPS technology. Chipsets can now fit in the area of a postage stamp, and they are faster and more accurate than ever before.

JACKSON HU, MS'76, PhD'78, a semiconductor industry veteran, is president and CEO of SiRF, a fabless communications IC and IP (intellectual property) company devoted to GPS tracking, navigation, and wireless communications systems for consumer applications. A rapidly growing company, SiRF made *Upside Magazine's* Hot 100 list for 1999, an award that recognizes excellence and innovation among high tech startups. SiRF's technology can be found in wireless handheld devices, PC-based systems, automobile applications, and consumer and marine products. Its new SiRFstarII technology launched a new generation of GPS architecture with improved performance and a receiver about the size of a postage stamp.

SiRF does not produce an end user product. Instead, it produces the IC and software for other companies. SiRF provides core technology, including some patented algorithms that allow GPS receivers to search satellites very quickly, acquiring signals faster while using less power. "For mainstream consumer applications," explained Hu, "you don't need centimeter precision required by high-end applications. You need fast response time."

Hu earned his BS in electrical engineering from National Taiwan University. UIUC rose to the top of his list when looking at graduate schools because of its reputation in computer science and the ILLIAC research going on there. He was particularly intrigued by the logic design research being conducted by professors like Saburo Muroga. "Muroga was one of the very serious and dedicated professors," he said. "For group meetings, each student was assigned to present a topic. This was excel-

lent discipline. I also clearly remember one thing he said: 'You guys think the pressure in graduate school is high. That's nothing until you start to work.' And he was right." Hu later earned an MBA from Santa Clara University.

When Hu got his PhD in 1978, Taiwan's electronics industry had not yet taken off, so he began his career at Zilog, in California, where he worked with Masatoshi Shima, designer of the company's Z80 microprocessor. Working initially on the Z8010 memory management unit (the first commercial MMU), Hu honed his skills in design techniques and methodology, architecture, testing, and a broad range of other things. Computer-aided tools were not readily available, so Hu used the SPICE simulation tool and his TI-50 calculator for circuit design.

After designing three microprocessors at Zilog, Hu left to start his first company, Verticom, with a couple of friends. Graphics was a hot, new field at the time, so the initial plan was to design a high-resolution, high-performance graphics terminal that could send graphics through a serial interface or modem to another terminal. But the project was ahead of its time, and the plan was scrapped. When IBM introduced the PC in 1981, Verticom switched its focus to PC graphics. Verticom went public in 1987 and was later acquired by Western Digital Corp. Hu left in 1989 to join startup S3, where he was responsible for developing the first single-chip graphics accelerator for the PC.

Originally S3 wanted to develop products for system core logic as well as graphics, but by the end of 1990, the company began to experience problems. Coupled with an uncertain Persian Gulf War economy, S3 was forced to cut back, abandoning its system core logic chip efforts. The company applied its resources toward developing a powerful GUI accelerator for Windows 3.0, which Microsoft introduced that year. S3 took off like a rocket from there. It became the industry leader in terms of market share, and the company went public in 1997. (Terry Holdt, BSEE'67, MSEE'68, was S3's CEO at

that time.) While at S3, Hu had built an analog team, a COT (custom owned tooling) team, as well as a new audio and communication business unit.

After seven years, Hu left S3 in October 1996 to join some former S3 employees, including Dado Banatao, who had founded SiRF in 1995. Hu accepted the offer to become SiRF's president and CEO because he was intrigued by the applications of GPS, his background fit well with SiRF's business model (fabless communication IC and IP), and the company was adequately backed financially.

Using GPS technology, SiRF set out to deliver instant location information to users anywhere in the world. What sets SiRF apart from other GPS companies is its focus on mainstream consumer applications, rather than military, surveying, precision agriculture, aviation, and other precision high-end applications of GPS. The main differences between those specialized applications and consumer applications are the production costs, volumes, and the precision requirement. The first mainstream consumer use of GPS technology started around 1996 when its use in automobiles became popular. SiRF believed that if the cost, size, and power consumption of GPS receivers could be reduced, GPS could expand into PDAs, notebooks, cell phones, and even wrist watches. By far, GPS's biggest application is for emergency operations. The FCC 911 mandate for wireless carriers requires that by October 1, 2001, every 911 call needs to provide location information within 125 meters. GPS is one of the technologies that can be used to fulfill this mandate in wireless cell phones.

The GPS area is exploding. The world market for GPS chipsets is expected to grow from $148 million in 1999 to $2.2 billion in 2004. Location information technology can provide many other useful applications such as the tracking of children and the elderly, navigational aids for drivers, billing based on location, car theft prevention, fleet management, to name a few. "Overall, from a technical standpoint," said Hu, "GPS technology is still developing. The market is in its infancy, and the potential is really huge. The technology is mature enough to enter into

high-volume, consumer applications. Next year, we will see cellular phones with GPS capabilities."

Hu and his wife Michelle, a stockbroker, live in Cupertino with their son, who is in high school. Michelle is involved in community and school work and is particularly active in the Asian American Parent Association, a group which addresses educational issues in Silicon Valley's Asian American community.
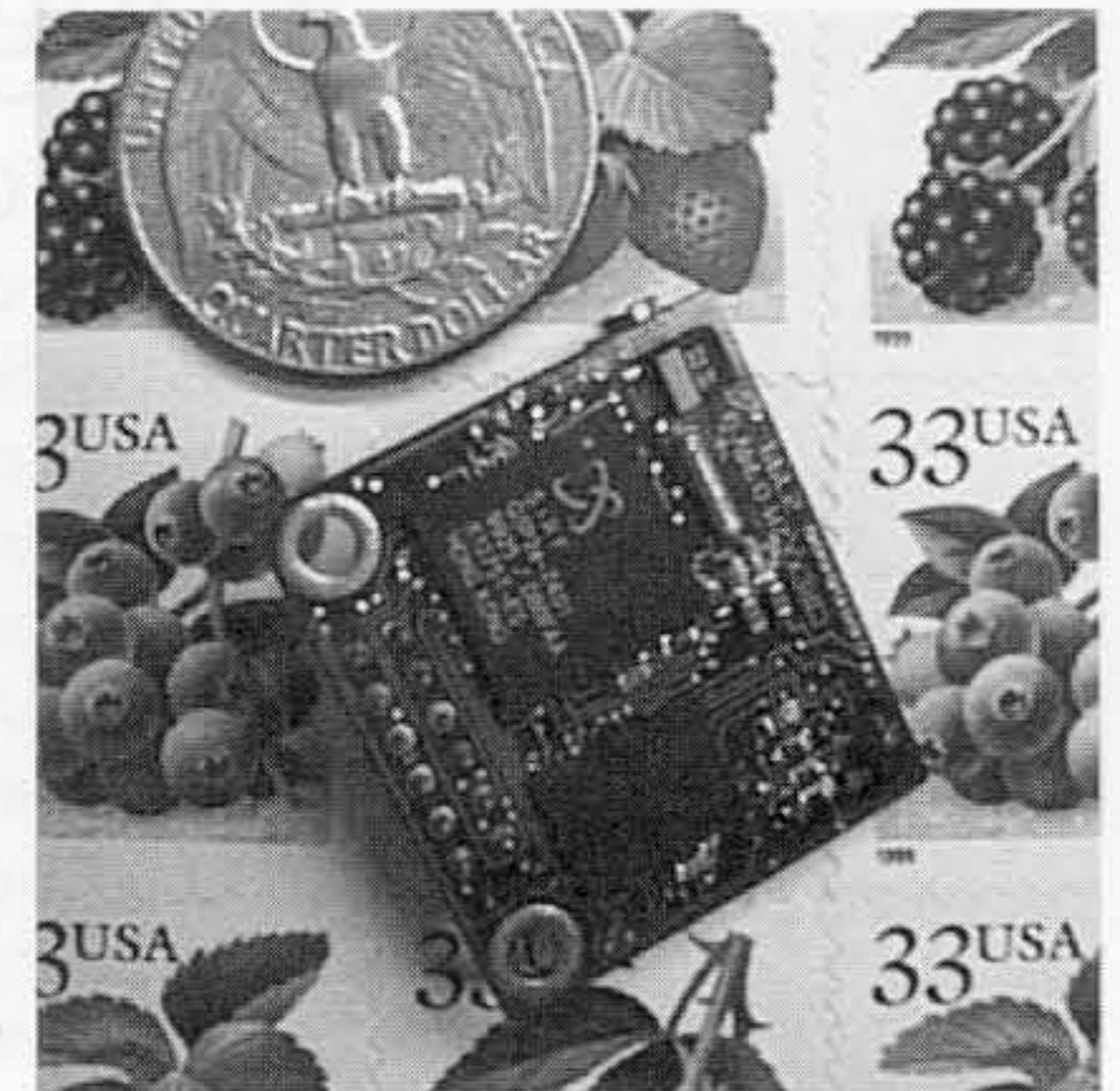
GPS receiver using SiRFstarIIe chipset

GPS systems

GPS (Global Positioning System) is a radio positioning system that provides users with position, velocity, and time dat viasatellite signals. The GPS constellation consists of 24 orbiting satellites, 4 equally spaced around each of 6 different orbital planes. The system was developed by the Department of Defense. SiRF (Si for silicon and RF for radio frequency) designs chipsets and modular software packages that allow manufacturers to embed GPS technology in their products. SiRF's GPS architecture has sped up signal reacquisition to 100 milliseconds, a noticeable improvement over previous waits of one or two seconds. This summer, SiRF announced a new generation of GPS technologies, called SiRFstarII, which combines a high-performance GPS engine, a full-function ARM7 CPU, 1Mb embedded DRAM, and a radio frequency front-end in two chips. This stamp-sized system is smaller, faster, and more accurate than any system on the market.

www.sirf.com

Peng T. Ong's golden thread: Interwoven

Peng T. Ong is achieving great success applying the file system approach to Web management; Ong is founder and chairman of Interwoven.

PENG T. ONG, MS'88, is chairman of Interwoven, a company he founded in 1995. Based in Sunnyvale, Calif., Interwoven provides content management tools for e-commerce vendors. It made the *Red Herring* Top 100 private companies in 1993, and this year *Upside Magazine's* Hot 100 award for innovation, leadership, and performance.

Ong came to UIUC with an interest in artificial intelligence on parallel systems. He earned his BS in EE at UT–Austin because he wanted to have a one-level-down understanding of what goes on inside a computer as a pathway to become an entrepreneur in software. "When you build products," he said, "the higher the value of the product, the higher the barrier to entry for a copycat product. The value depends on the product's intellectual density. Software has high intellectual density—it's almost pure intellectual property. It's more valuable and differentiated, so it's easier to build a business upon that."

INTERWOVEN

A self-described "nerd-entrepreneur," Ong studied artificial intelligence with former CS professor Stephen Omohundro at the Center for Complex Systems Research at UIUC. The Center for Complex Systems Research, founded by CS adjunct professor Stephen Wolfram, is an interdisciplinary group that investigates complex dynamic processes that occur in biology, physics, chemistry, and astronomy. It is now housed in the Beckman Institute.

After earning his MS, Ong went to Gensym Corp. in Boston, the company that supplied the expert systems for Biosphere II. There, he built real-time expert systems and a runtime and development environment for production control. Six months into the job, he became a manager, but he felt the company as well as the AI field was growing too slowly, and he looked more and more toward his Silicon Valley friends. Ong felt that the next hot area for AI was databases, so in 1990 he moved to California to join Sybase. With his father's health ailing, Ong returned to his home in Singapore, where he did contract work for Illustra. At a software entrepreneur's forum in 1994, he met Gary Kremen, who had started a company in San Francisco called Electric Classifieds, Inc., which created and operated online classified environments for media companies.

Ong joined ECI and helped it start Match.com, the leading matchmaking service on the Web. Ong was interested in doing core software systems but did not want to become a full-time builder of portal Web sites, so he stayed with ECI until the company grew to about 20 people. Match.com was sold, ECI renamed itself Instant Objects, and Ong left in 1995 to start his own company, Codery, Inc.

Ong changed the company name from Codery to Interwoven and started with a simple idea: when you get a lot of people working on a lot of parts, all of which need to come together for one product, you need a system. This applies whether you are building cars or chips or software. Ong saw a huge need for such a system to do Web site management, for both work flow and configuration. "We positioned the company to provide content management for the enterprise Web. The market was there, and it required a high level of technology," Ong explained. "URLs look very much like a file system. Databases have been built to store things for Web sites, and the site sits on top of the database only. But the structure of the information does not match. Databases look like rows and columns, but a Web site is a network. Clearly there was a need for storage methodology that reflected the information architecture of the Web, as opposed to just trying to squeeze the information architecture of the Web onto a relational database. Information has a natural structure, and the storage system should reflect that structure. We don't force users to change the structure of their information, which is one reason we've been so successful. Interwoven uses a file system approach, and one of the technical barriers to entry is that it is not easy to build a file system, let alone one that can keep different versions of your Web site."

Interwoven targets big Web sites because they are exponentially more complicated.

Clients include Cisco, AT&T, Nortel, Federal Express, and Gap, Inc. Its principal product is TeamSite, which combines the functions of content management, version control, work flow, and application development in an open, standards-based platform that allows large numbers of contributors across an enterprise to add Web content in a well-managed manner. The software won the OSA (Open Systems Advisors) Crossroads A-List 99 award in the Web content management category in 1999.

Interwoven's successful IPO was on October 8, 1999. Ong reflected, "An IPO is a rite of passage, but nonetheless it is just one event in the scheme." In addition to his work at Interwoven, Ong is also an angel, helping friends launch companies. "It's a culture of mutual help," he said, describing Silicon Valley. "Once you have a critical mass, that starts happening. Every weekend in the valley, you have about a hundred meetings going on—friends talking to friends, coaches, and mentors about how to start a business. When people try to replicate the Valley, that's the part they don't realize. That's what makes the Valley successful—the extreme network that happens at the grassroots level."

Ong is married to Wai-Ping Leong, BS Math'88, AB Music'89, MS Statistics'90, a biostatistician for Centaur Pharmaceuticals, Inc.

Illini party at Intel

An Illini reception was held for Illinois alumni at Intel, in Hillsboro, Ore., on April 29, 1999. The party was co-sponsored by Intel and the CS and ECE departments. Intel hosts were Leo Yau, PhD'69, and Mark Bohr, BS'76, MS'78, both Intel Fellows. Department heads Dan Reed and Steve Kang, along with CS associate head Bill Kubitz, represented CS and ECE. About 50 people attended to get updated on the departments and their relationships with Intel as well as to have fun with fellow Illini. Below are some Illini Intel partiers.
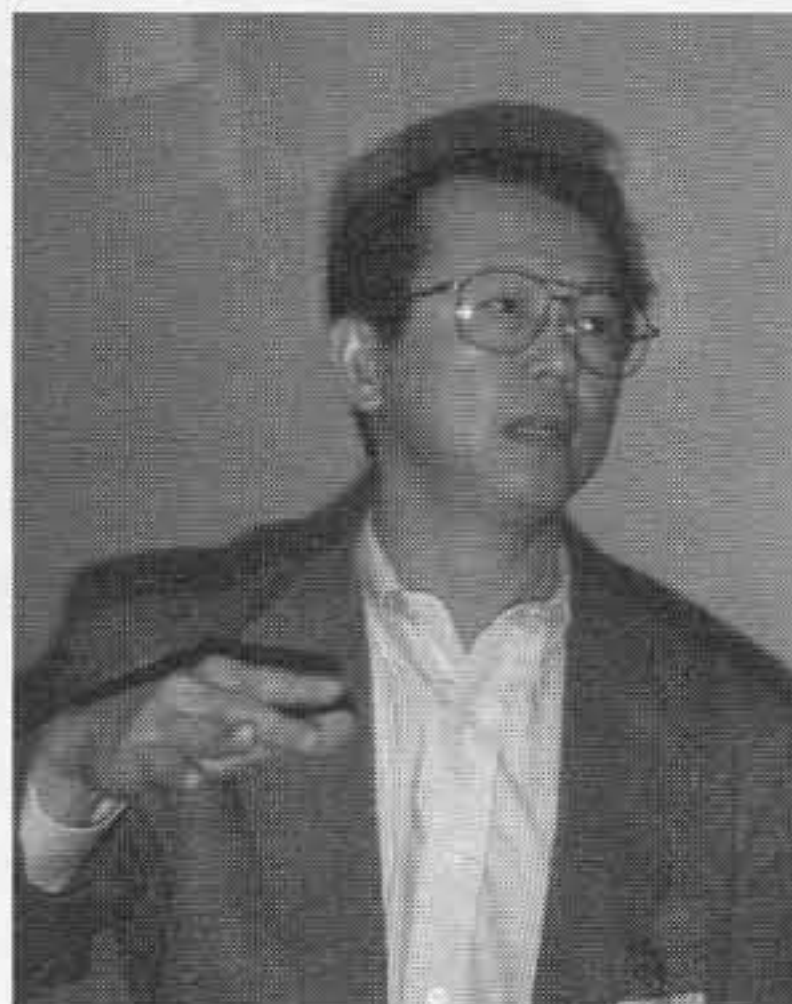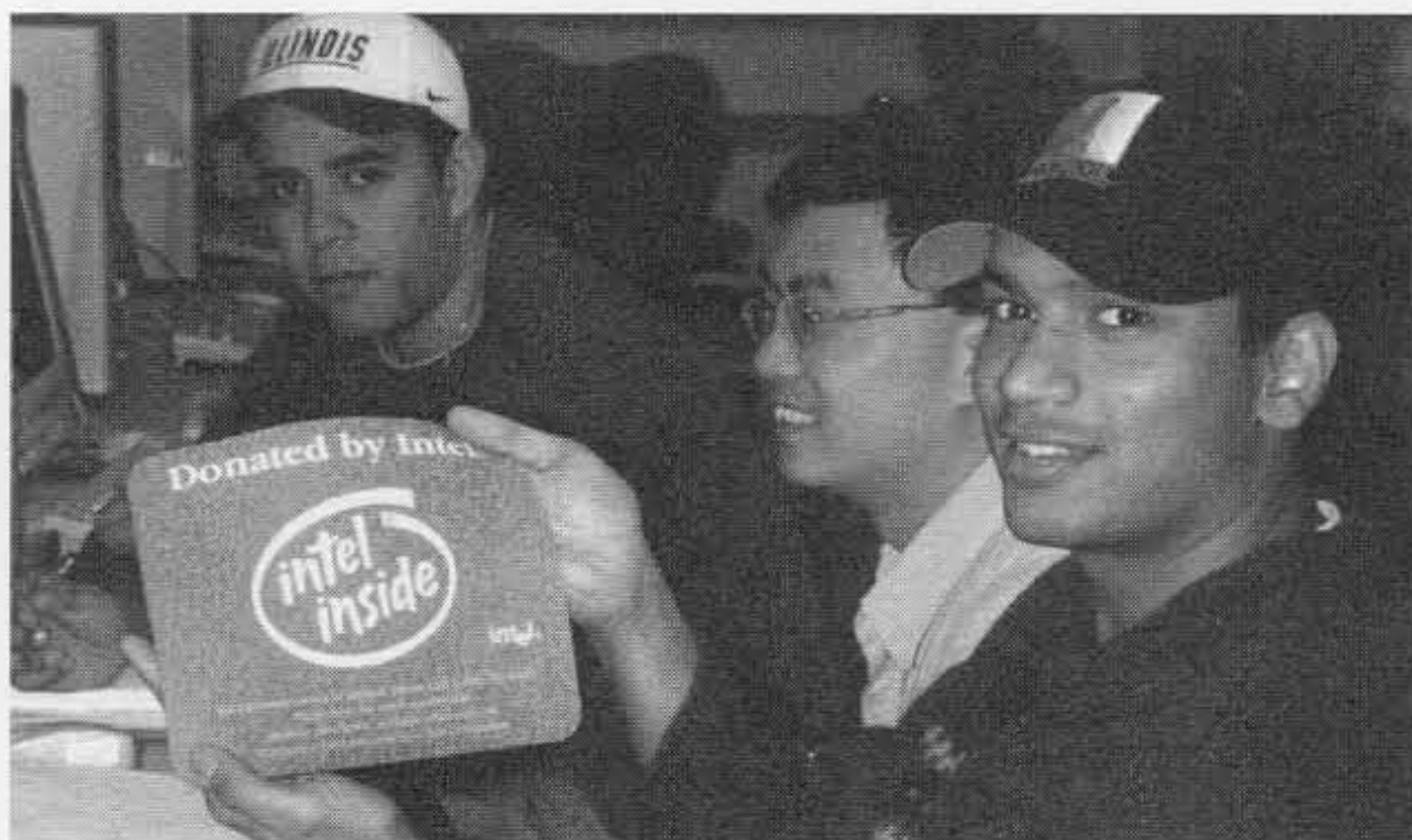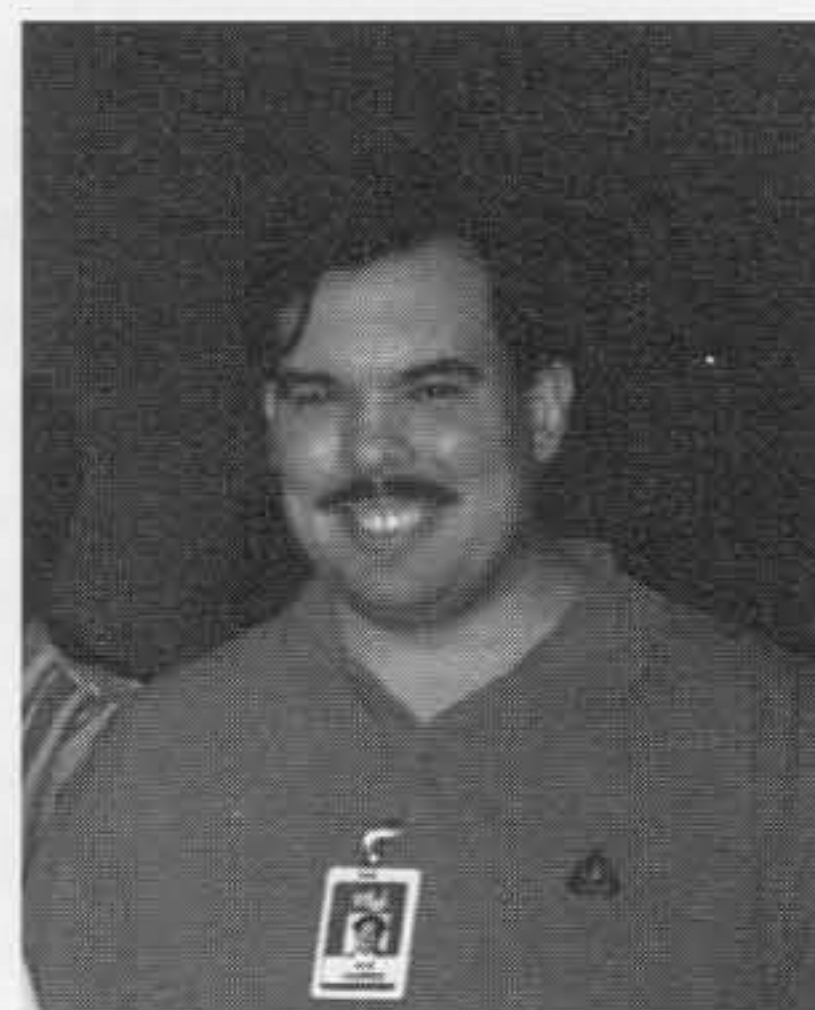

Leo Yau, PhD'69
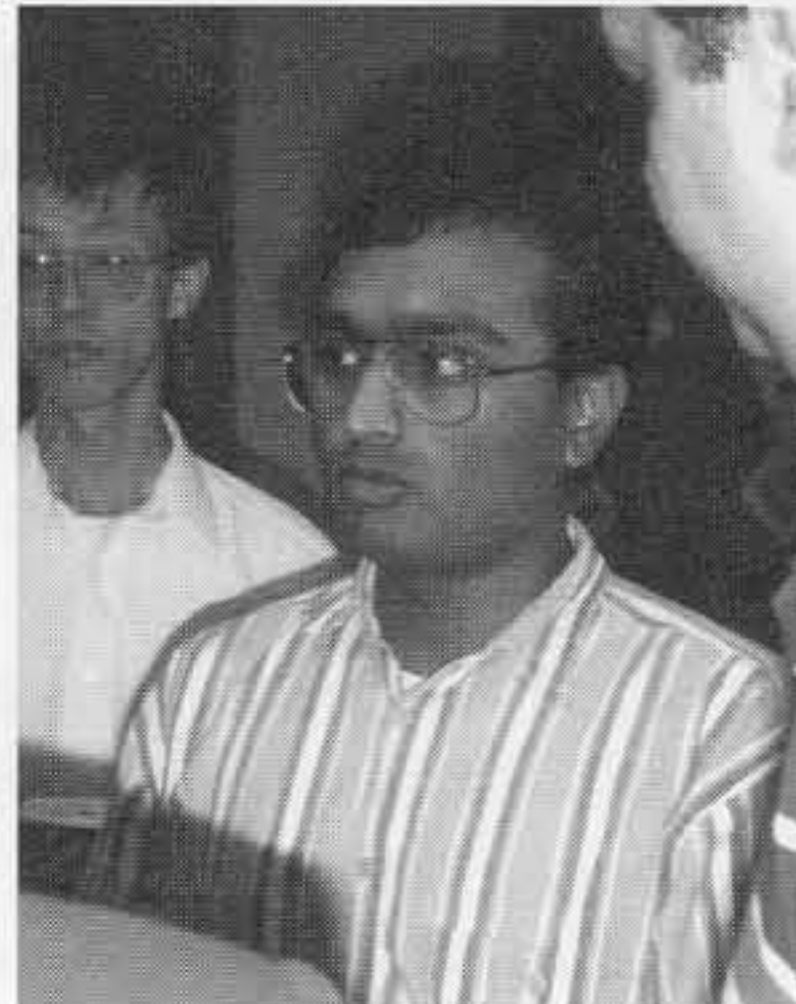
Venkat Krishnaswamy, PhD'97
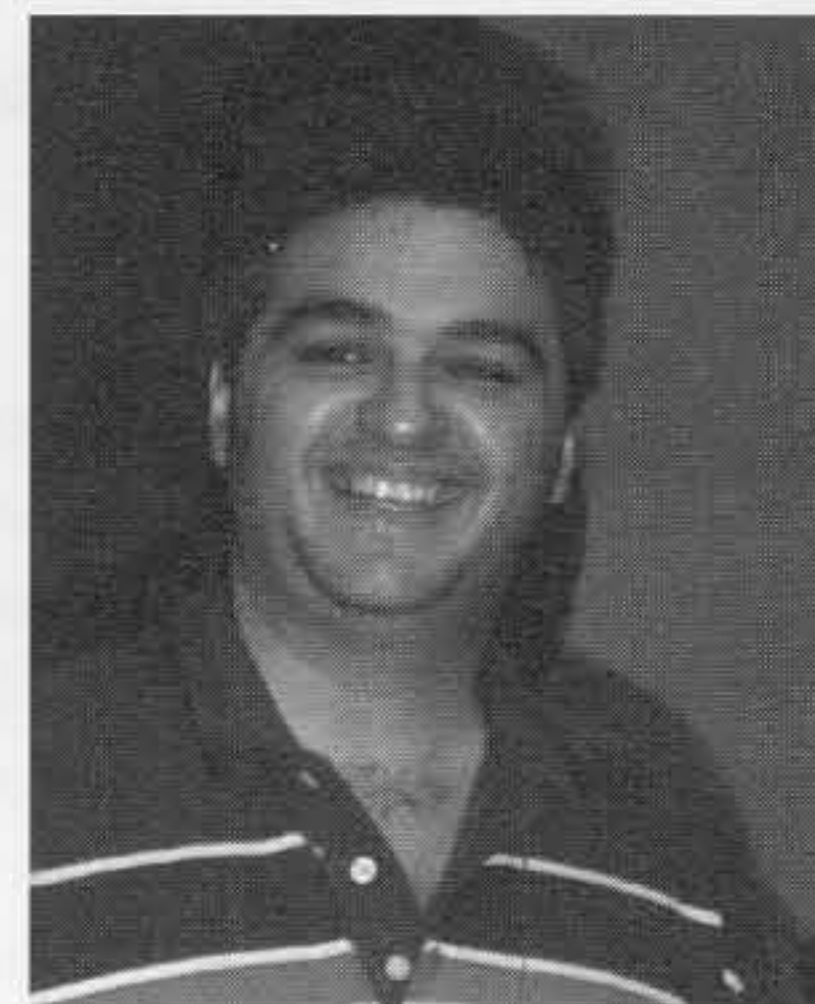
David Koufaty, PhD'98

Students in the department's Intel-sponsored PC lab sent their greetings to Intel alums during a slideshow.

Rob Knauerhase, MCS'95

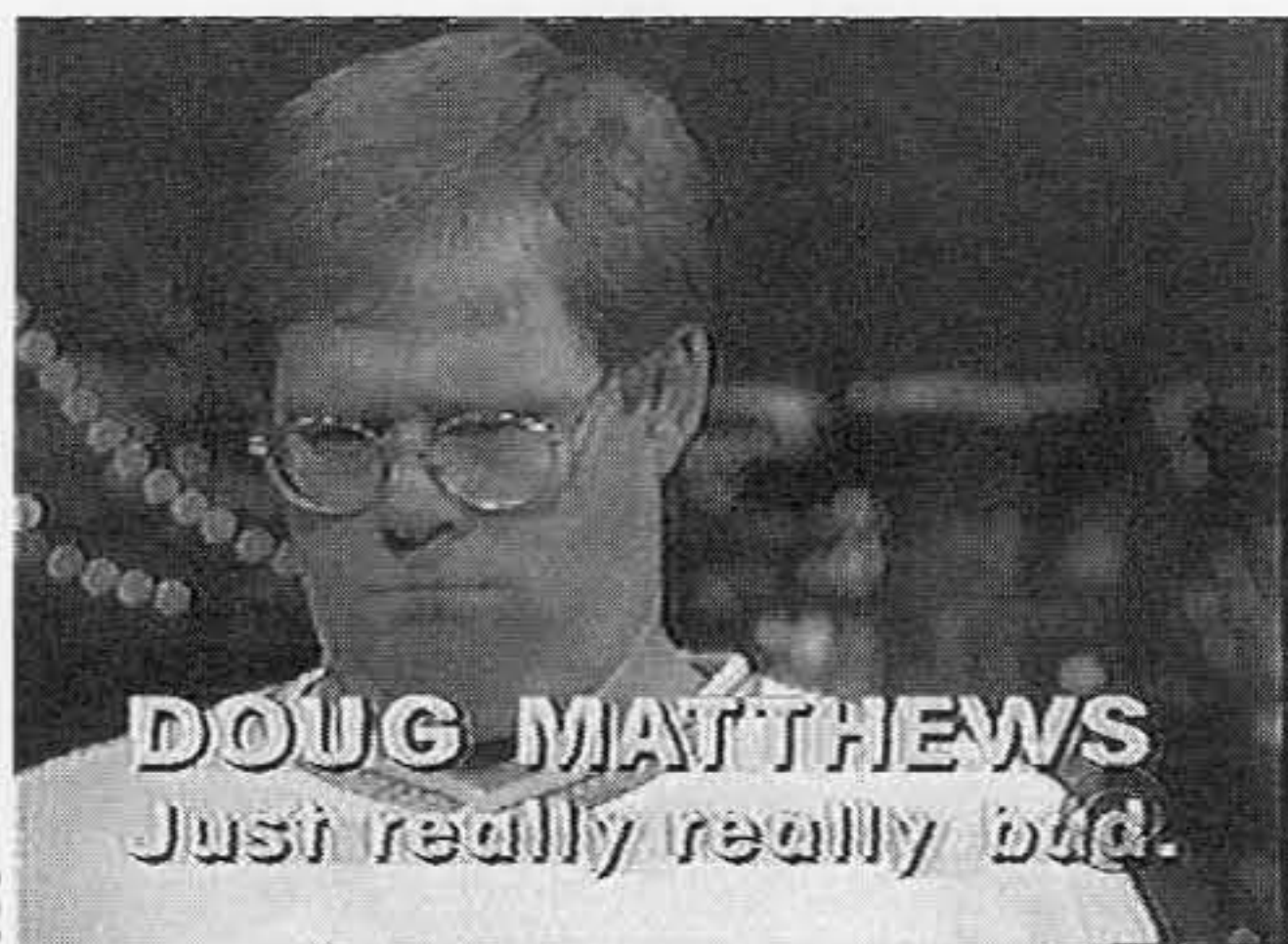## Software, dinnerware: What's next for Jon Mittelhauser?

Jon Mittelhauser, BS'92, MS'94, left Netscape in 1998 and co-founded The Basin, a Saratoga, Calif., restaurant featuring "the casual atmosphere of a neighborhood bar and grill combined with the high-quality food of a more formal restaurant." He still has the restaurant but is no longer involved in its day-to-day operation. Instead, his days are filled with being program manager of a Menlo Park start-up called Geocast Network Systems, Inc., where he is reunited with fellow Netscaper Chris Houck, MS'92. Both were original members of the Mosaic team at NCSA. Geocast is involved with wireless broadband networks for the Internet. Mixed in with all of that, Mittelhauser managed to devote some much needed time off to travel with Erica, his fiancee, to Europe and Asia.

www.thebasin.com, www.geocast.com

A star is born

Doug Mathews

If you saw David Letterman on October 23, 1998, or have been watching reruns, you may have caught CS alum Doug Mathews in a starring role. Mathews, BS'85, and his wife, Kristen, were at a pizza restaurant, "and next thing you know," said Mathews, "we were on Letterman." Letterman asked him some questions, and parts of Mathews's responses, taken completely out of context, were quickly woven into a comedic campaign advertisement in which Mathews was running for Congress. The couple were whisked into the Ed Sullivan theater, where they met with Letterman and viewed the hilarious commercial. Mathews said that he worked for Motorola in St. Louis, which tipped a viewer off to the possibility of his being a CS alum from U of I. "After we were on," said Mathews, "they took us to the green room where we watched the show with Martin Short and the band Phish. We had a great time with them. Afterwards, there were hundreds of Phish fans waiting outside for the band. Kristen and I were the first to come out, and there were people yelling 'Doug Mathews!' and asking for my autograph."

After graduating from Illinois, Mathews worked at Fairchild/National and Intel before joining Motorola, where he has been for the last eight years. He is a regional sales director, and he and Kristen have four children, from ages 9 to 3. They were in New York City for a day to see the show "Miss Saigon" as part of an East Coast vacation.

Doug Mathews and David Letterman

Visiting speakers, 1998–99
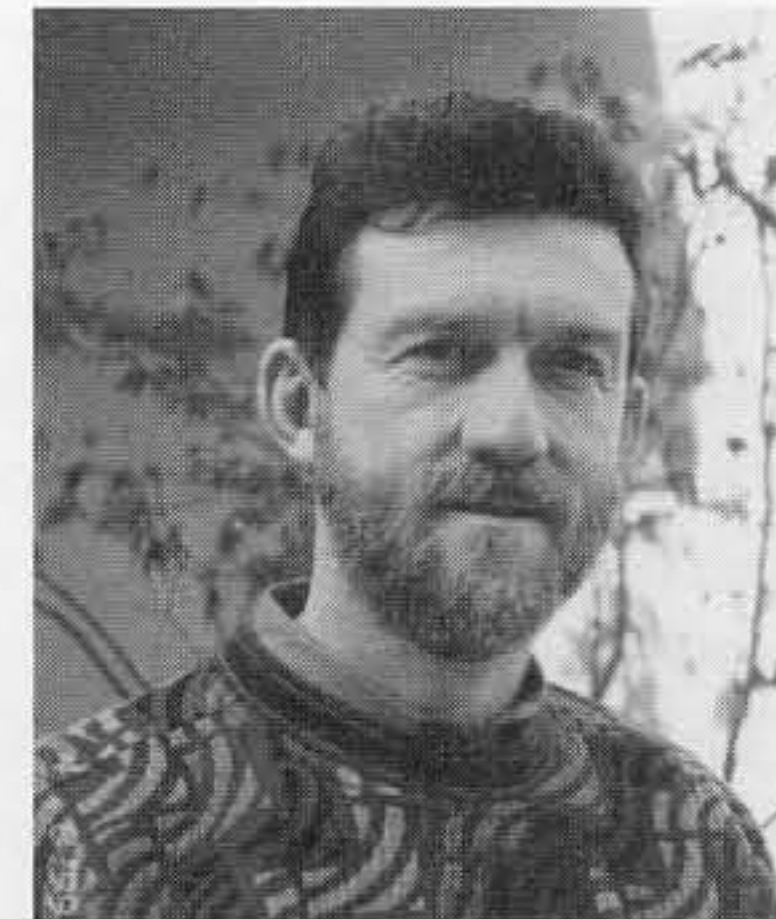
Jerry Fiddler

Rick Schell

Jerry Fiddler, AB'74, MS'77, and **Rick Schell**, AB'72, MS'77, PhD'79, delivered Distinguished Entrepreneur talks in April 1999. Fiddler, co-founder and chairman of the board of Wind River Systems, talked about his company and the issues and technical challenges facing the real-time and embedded systems industry today. Schell, former vice president of engineering at Netscape, is an independent investor and "entrepreneur in repose." He spoke about the role of the university in developing technology and about computer science and its relationship with startups—young and old.
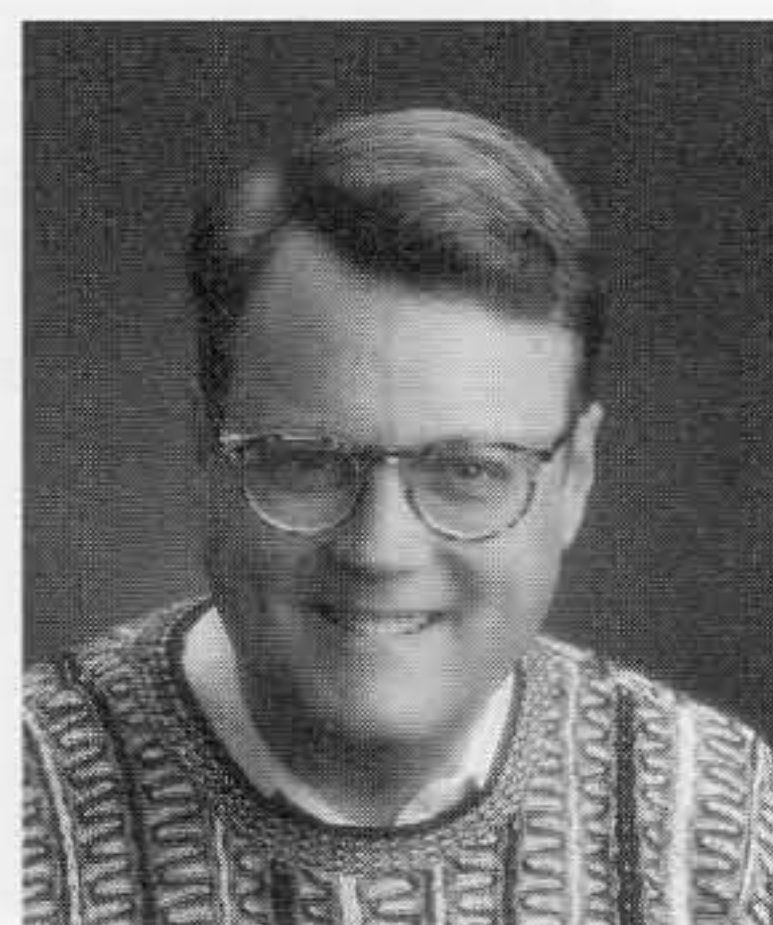
Tom Holman

Tom Holman, BS Communications'68, gave a special talk in April called "The Bit Rate of Reality," in which he discussed where today's technology fits into developments heading toward ultimate transparency of audio/video experiences. Holman is president of TMH Corp. and a professor at USC. He is best known for inventing the THX Sound System for movies.

The 1998–99 Distinguished Lecturer Series brought the following speakers: **Larry Peterson**, Princeton; **Leslie Valient**, Harvard; **Gary Miller**, CMU; **John Hennessy**, Stanford (Donald B. Gillies Memorial Lecture); **David Waltz**, NEC Research Institute; **Andrew Stuart**, Stanford; and **Randy Katz**, UC–Berkeley. Some of these talks have been archived, www.cs.uiuc.edu.

ACM's 5th annual conference

ACM held its fifth annual student computing conference October 8–10, 1999. Called "Reflections | Projections," the conference featured keynote speaker Larry Tesler, founder of Stagecast Software, maker of interactive simulation software, and former vice president of Internet platforms at Apple and Xerox PARC researcher. Other speakers included Michael Abrash of Microsoft, one of the original authors of Quake; Eric Allman, inventor of Sendmail; Theo de Raadt, head of the OpenBSD project; Guido van Rossum, creator of the Python programming language; and Astro Teller, an expert in AI and machine learning and author of the novel *Exegesis*. The conference also featured a job fair (with more than 30 companies), workshops, and a programming contest. Some 400 students from UIUC as well as other midwestern universities attended. The alums pictured here are some of the many who attended the conference, some to recruit for their companies at the job fair.

Mark Roth, BS'99, with Eric Allman, inventor of Sendmail. Roth, a former LUG chair of ACM, is a UNIX system administrator for CCSO at UIUC.
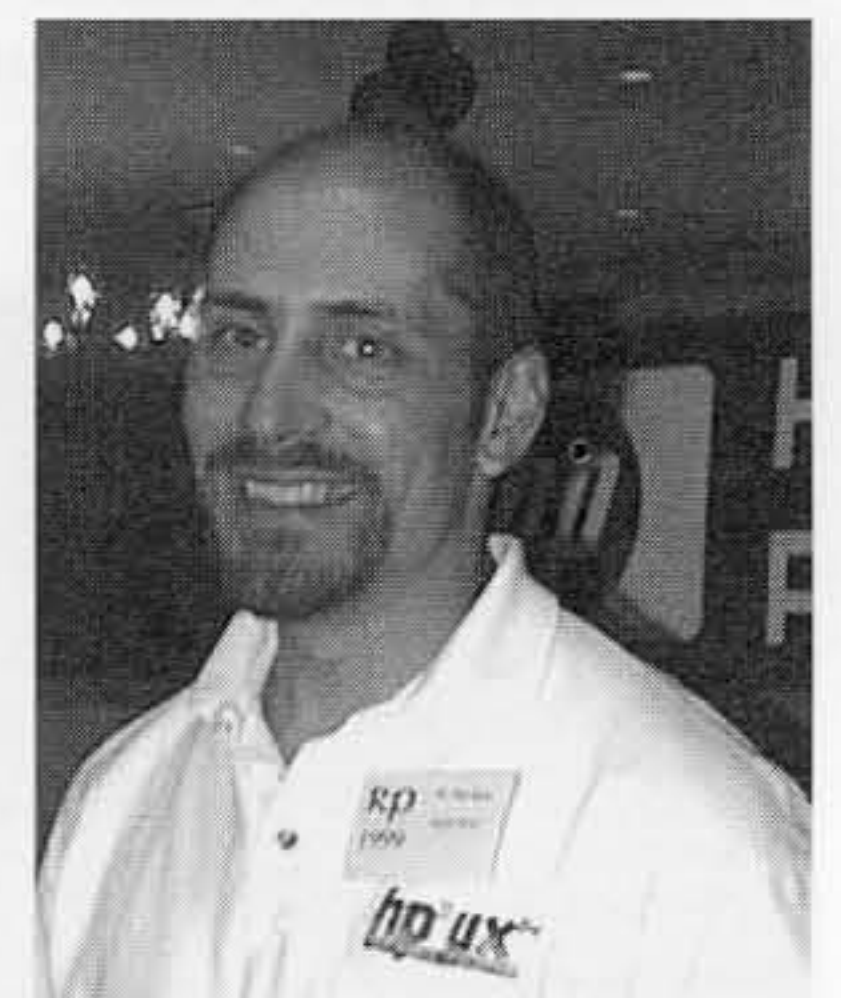

Keith Garner, BS'97, Resource Information Management Systems

Greg Kaiser, BS'98, Green Hills Software

Kristian Rickert, BS'99, IntegrationWare

Bob Bury, BS'79, Hewlett-Packard

State senator visits department

Deb Israel

Senator Dillard with Manuel Roman, graduate research assistant in Roy Campbell's group

Five Illinois state senators from the High Technology Task Force visited several campus locations and local companies on October 14–15, 1999. The visit was part of a fact-finding mission focusing on technology transfer and commercialization. Senator Kirk Dillard paid a brief visit to the computer science department for a presentation by department head Dan Reed and a demonstration of wearable computers by Professor Roy Campbell's research group.

Reed spoke about the need for information technology workers and cited the present shortage of 19,000 unfilled positions in Illinois alone. Reed also introduced the visitors to the department's smart spaces research program, which is exploring mobile, responsive objects for distributed collaboration. Senator Dillard and Steve Schomberg, associate chancellor, donned head-mounted displays and experienced first-hand one of the directions that wearable computing technology is heading; "Borg-like" interfaces are very near. They were able to transmit and receive real-time audio and video streams via wireless network interfaces.
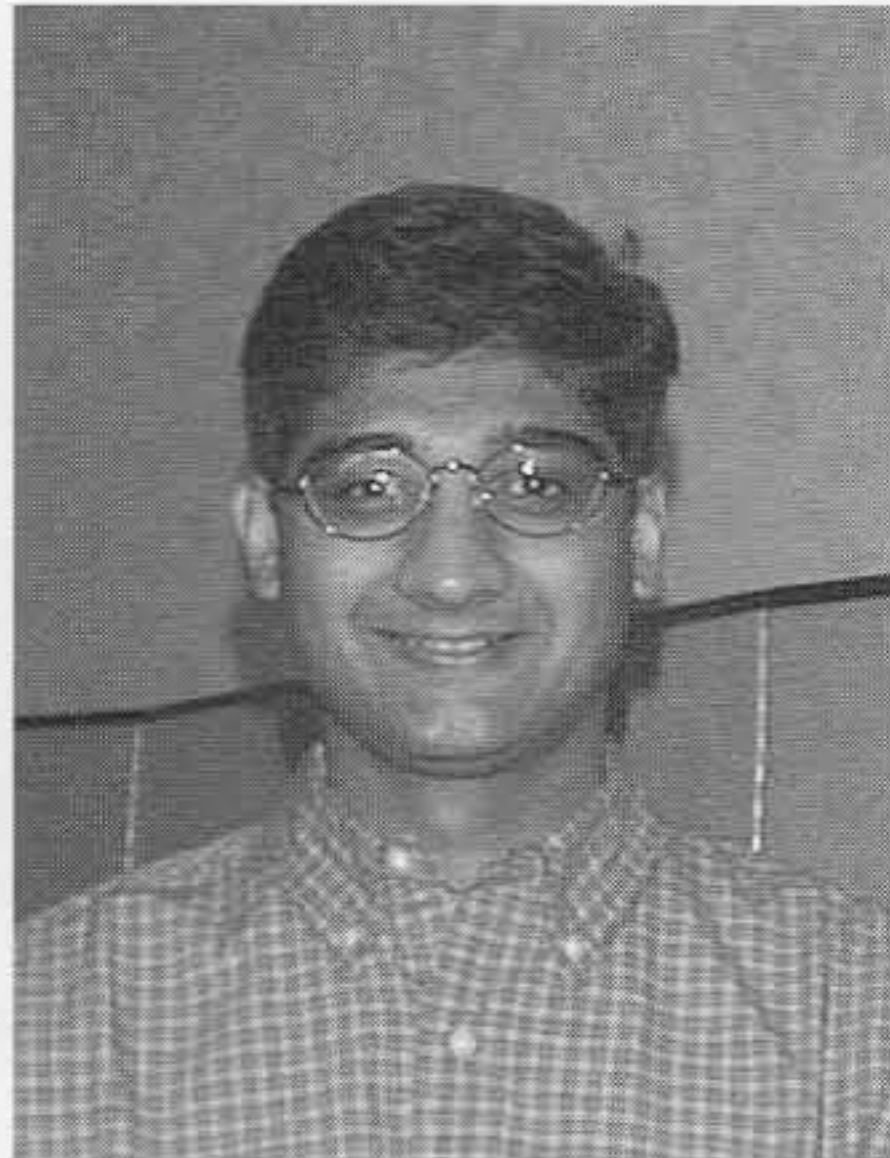
Alums at Expo 99: A mini-CS reunion

Engineering Expo, an enormous job fair put on by the Engineering Council, drew many alumni. It was held at the Illini Union from September 20–22, 1999. More than 200 companies took part in this sold-out event. Here are some of those who participated.

Keith Schriner, BS'98, Dunn Systems
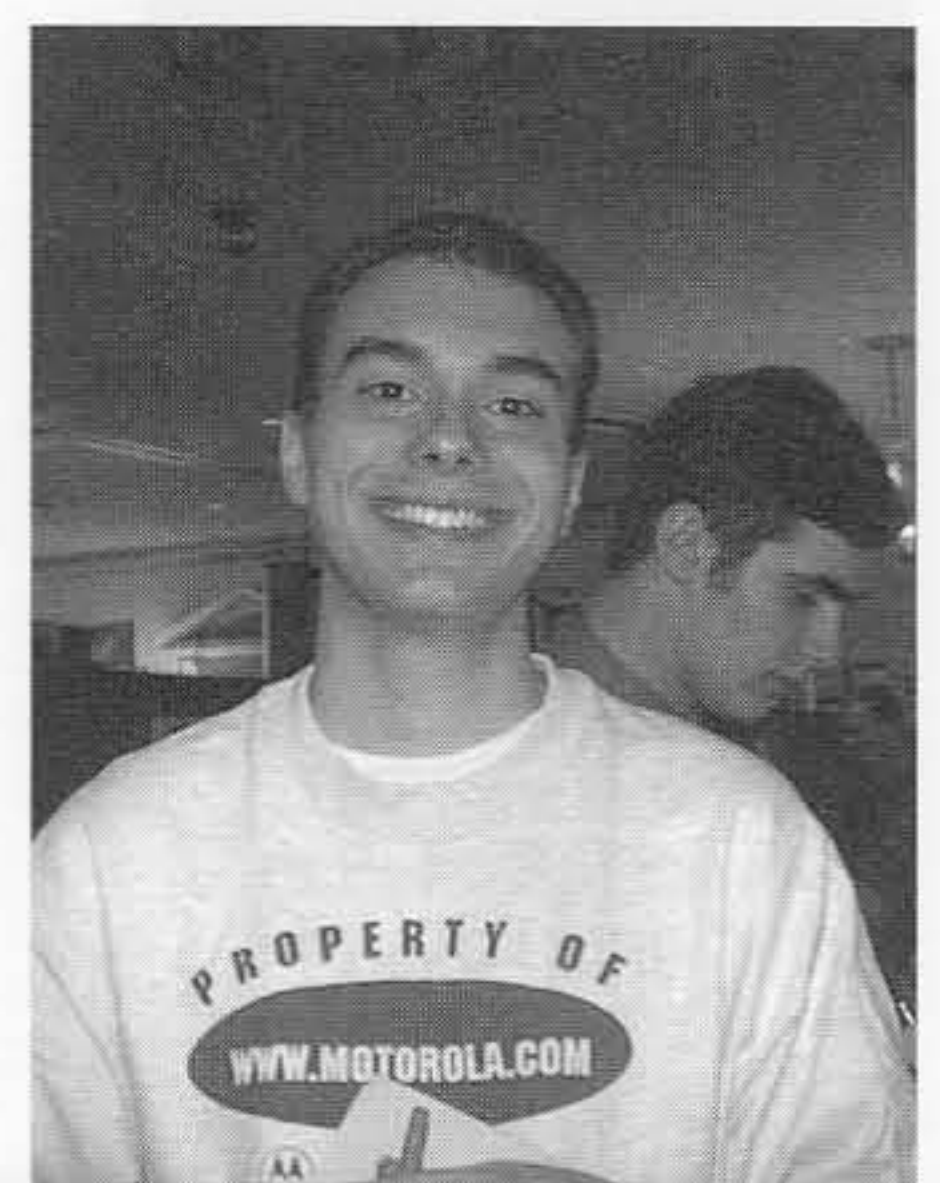
Devang Mehta, MCS'99, Siebel Systems

Courtney Nash, granddaughter of the late Professor J. P. Nash, and Jeff Holden, BS'91, MCS'92, Amazon.com
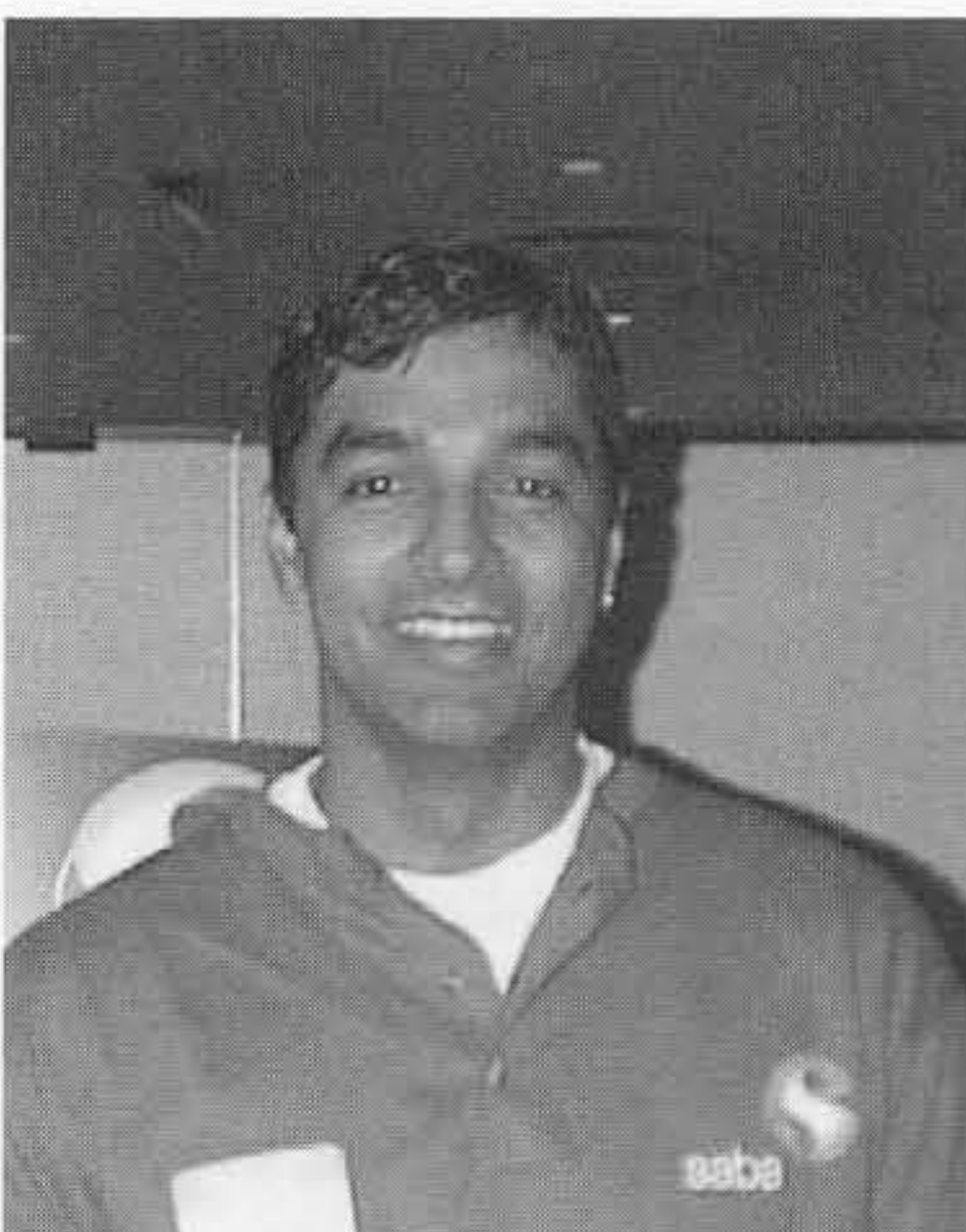
Neil Feiereisel, MCS'92, and Eric Reffett, BS'96, National Instruments

Roger Cheng, BS'97, BDS

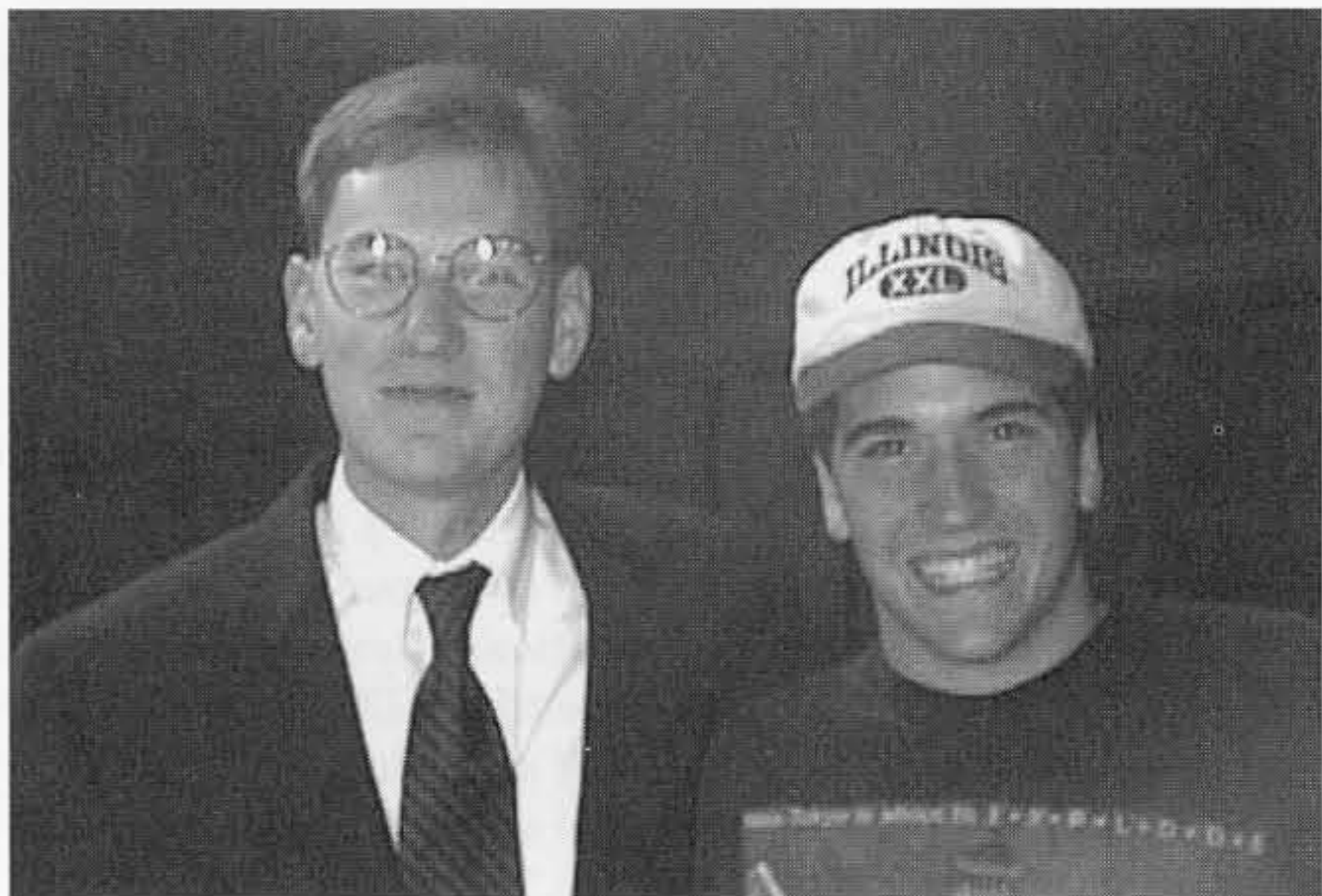*Jason Lowe, BS'94, Motorola*

Rajesh Bhatia, BS'90, Saba

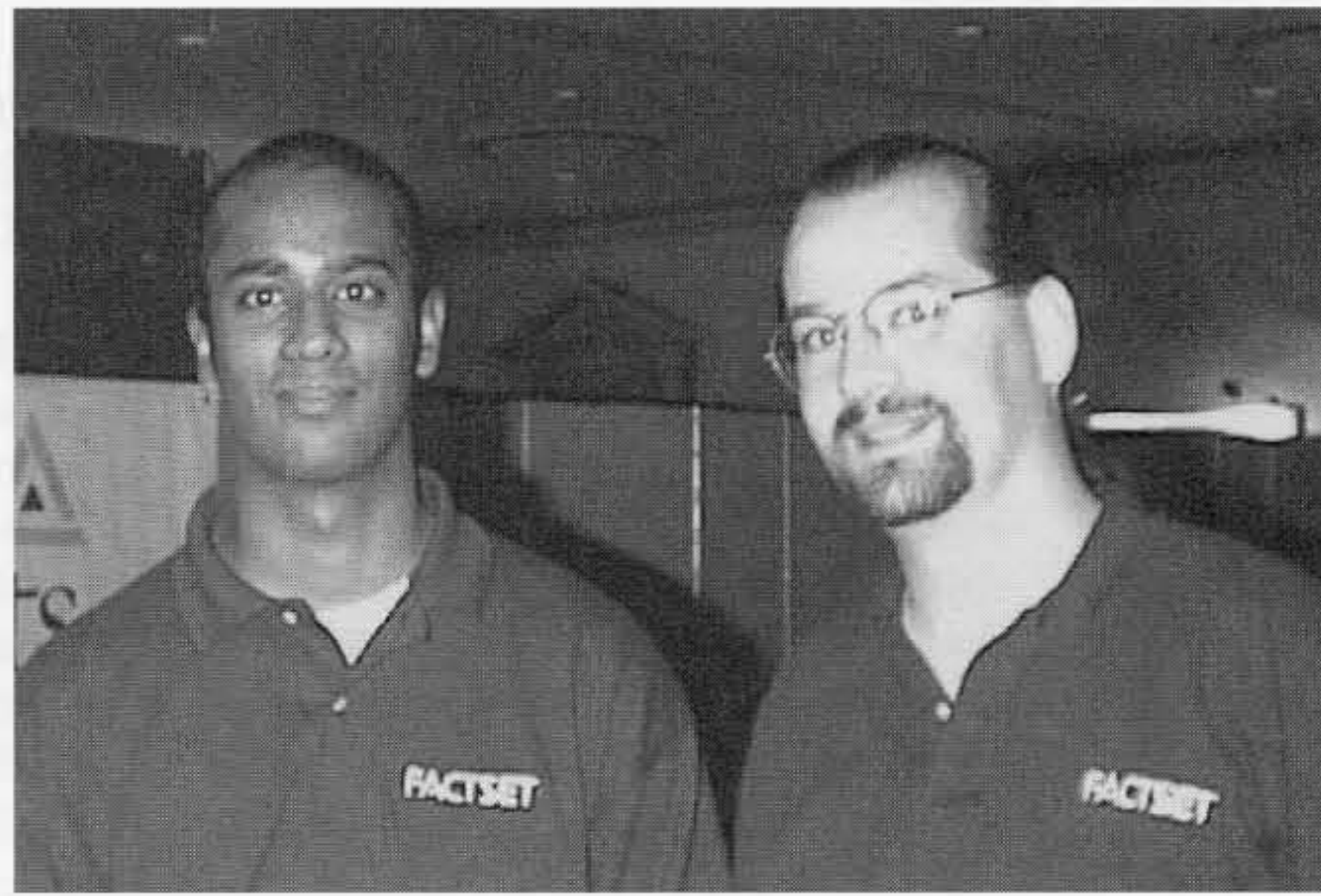*Kim Mast, BS'77, MS'84, MBA'84, Hewlett-Packard*

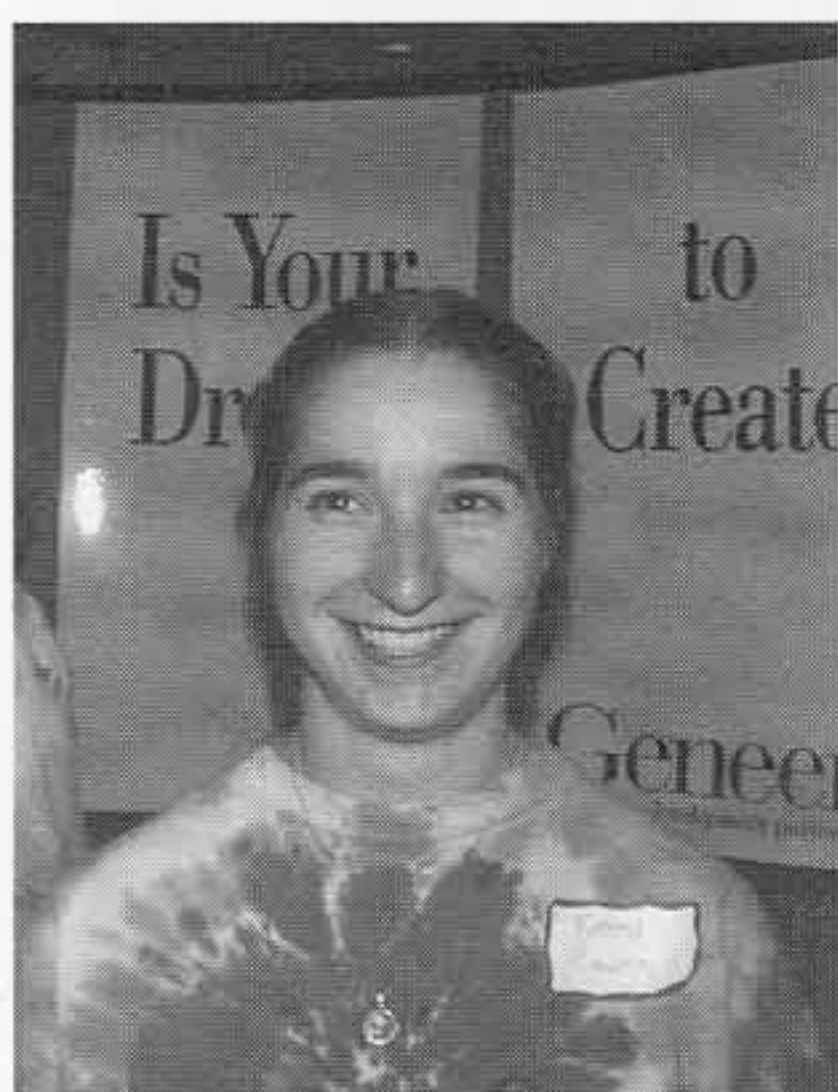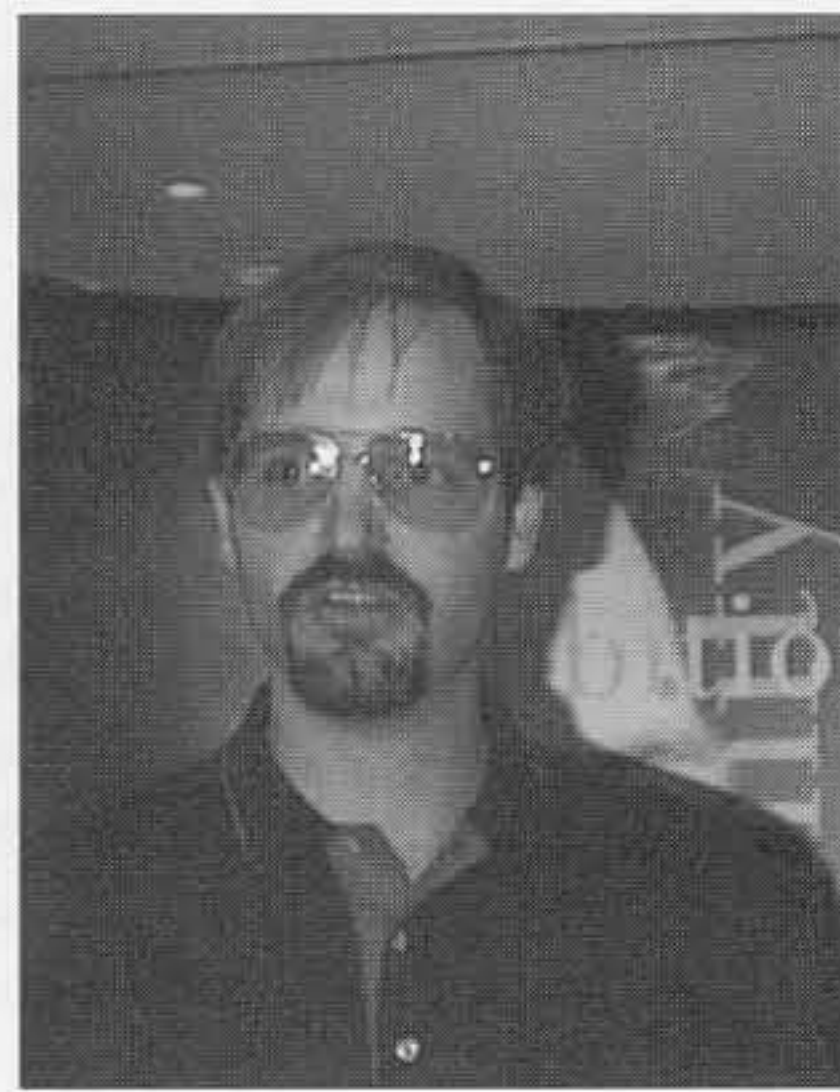*Bryan Urteaga, BS'99, and Michael Bernardoni, BS'84, Crowe Chizek*

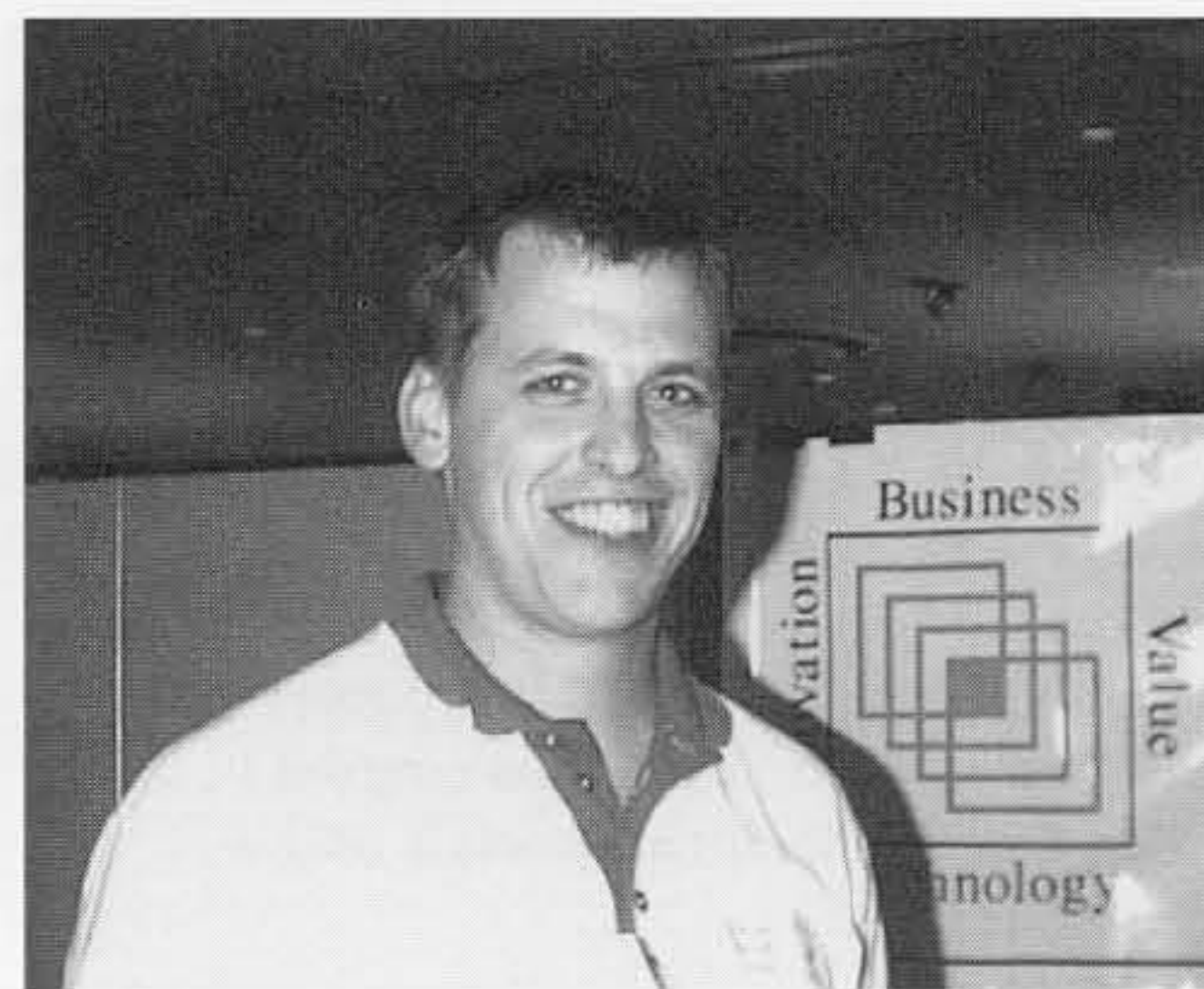*Job-seeking seniors Doug Grim and Joe Brucker*

Chris Sims, BS'98, and Kushal Khan, BS'99, FactSet

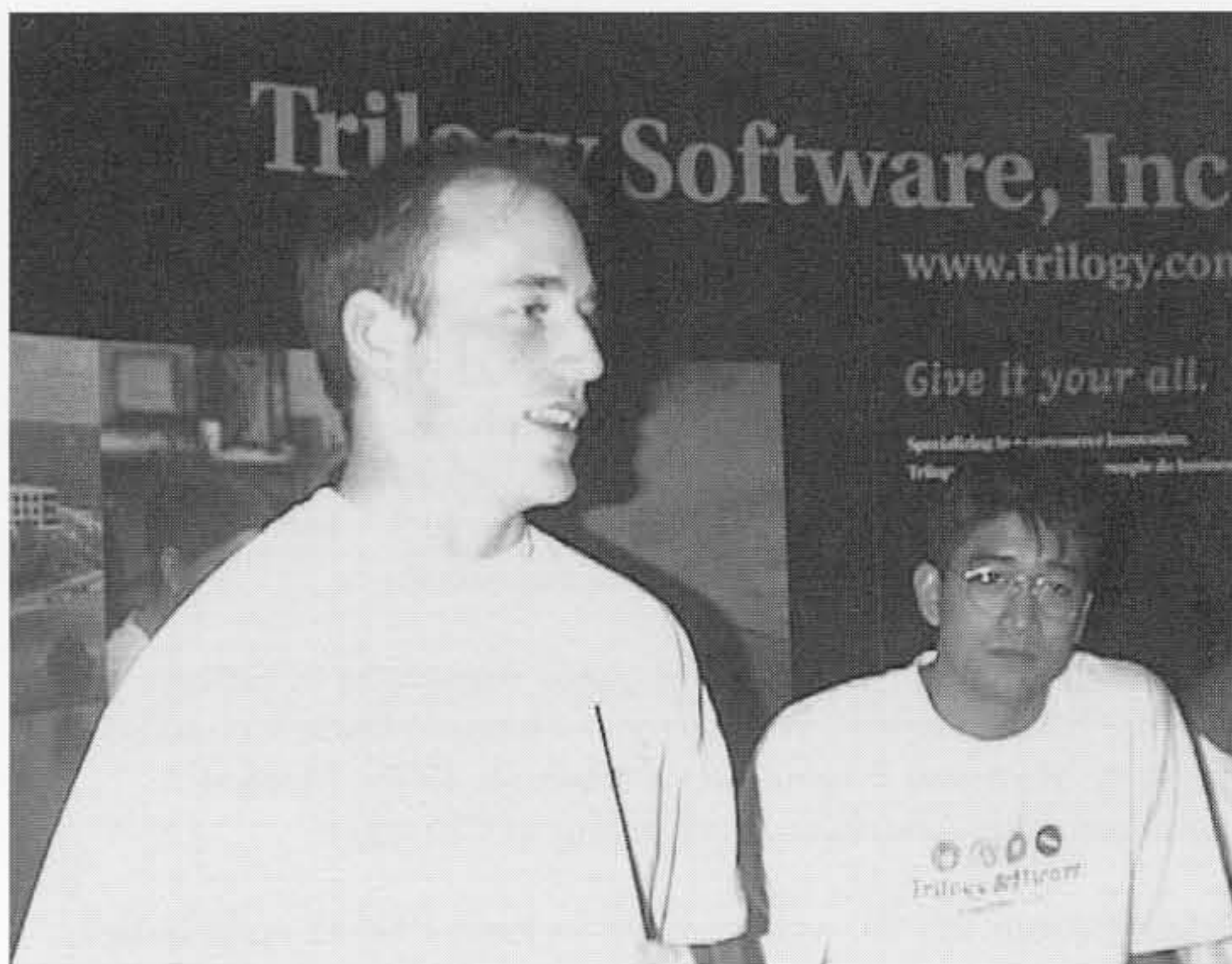*Kathleen Cupec, BS'98, Geneer*

David Brosh, BS'95, American Management Systems

Marc Mitchell, BS'89, Enterprise Information Solutions

UIUC trio makes *Wall Street Journal*

Chris Brown and Lawrence Lee at Expo 99

Three recent grads made the *Wall Street Journal* in an article called "'Hire Me, Hire My Friends,' Recruits Say" (June 22, 1999). The article talked about group-hire strategies used by companies like Trilogy Software. Eric Brown, BS'98, his twin brother Chris, BS CompE'98, and their friend Lawrence Lee, BS CompE'98, were all hired *en masse* by Trilogy. They found out about the company at the student ACM job fair, held every fall on campus. While they were students, the three lived with each other at various times and participated in the same study group. They are now roommates in Austin, Tex. According to Eric, who now works for pcOrder.com, a subsidiary of Trilogy, the company gets recent grads involved right away in recruiting, finding smart friends, and getting referrals.

Classnotes
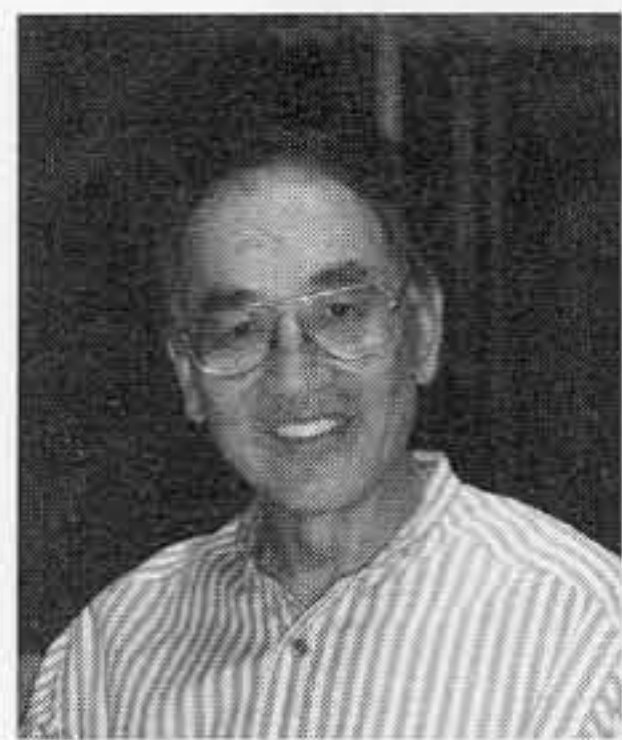
**Raymond T. Yeh**, BS EE'61, AM Math'63, PhD Math'66, a former student of Professor Dave Muller, taught at Penn State, UT–Austin, and Maryland. He was head of the computer science department at both UT–Austin and Maryland. He started three Austin software companies—Syscorp, ISS, and FunSoft—and was active in setting up the Austin Software Council and other efforts to incubate startups from UT research. He is now semiretired.

Raymond T. Yeh

Austin Henderson, MS'67, is a principal at Rivendel Consulting in La Honda, Calif., and has been working in human computer interaction since 1964. He is also co-founder of Pliant Research, a research consortium "exploring the theory and practice of computing systems that move beyond the rigidity of the formal." Before that, he has worked at Apple, Xerox, Bolt Beranek and Newman, and MIT's Lincoln Labs.

Sally Ahnger, BS'77, became VP of engineering at Verano in March 1999. She took the position after 13 years at Sun Microsystems, where she was most recently director of Information Resources. Before joining Sun, she developed file systems and distributed systems at both Ridge Computers and NCR. Verano, in Mountain View, Calif., develops context management software products for enterprise portals and e-commerce applications.

Robert Horst, MS'78, PhD'91, became director of research for 3ware in May 1999. 3ware Inc. develops data storage architectures. Horst joined the Palo Alto, Calif., company from the Tandem Division of Compaq, where he was a technical director and a founder of Tandem Labs. Before that he was a development engineer at Hewlett-Packard.
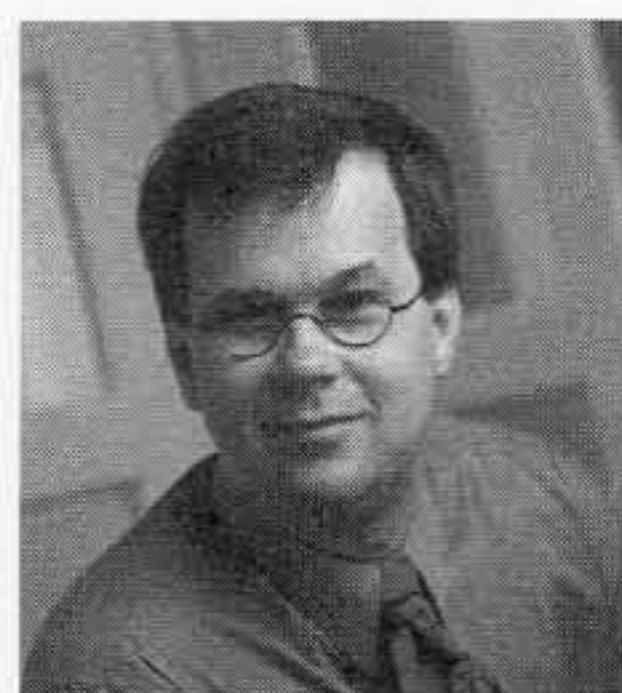
Mark Tebbe, BS'83, stepped down in June 1999 as president and CEO of Lante Corp., the Chicago-based consulting company he founded. He is now its chairman of the board. As an industry pundit, he writes a column, "Between the Lines," for *InfoWorld* magazine. Before starting Lante, Tebbe was with Arthur Andersen. Lante was ranked fifth in *Washington CEO* magazine's "1999 Best Companies to Work For" list of mid-sized companies. Also in 1999, he was inducted into the Chicago Area Entrepreneurship Hall of Fame and made *Crain's Chicago Business's* "Forty Under Forty list" of up-and-coming Chicagoans.

Mark Tebbe

Pervaze Akhtar, MS'84, became director of software development in April 1999 for Celotek Corp., a leader in global security for high-speed ATM networks, located in Research Triangle Park, N.C. Before that, he was director of ATM switch software at FORE Systems and has held positions in Transarc Corp. and Hewlett-Packard.

Todd F. Brandt, BS'85, was married to Karen Mathison in May 1999. He is a systems analyst at Commonwealth Edison in Chicago.

Tai Pham, BS'85, is president of Paragon Solutions in Chicago, a company he founded after a seven-year career at Lucent. The original plan for the company was to provide U.S. companies with a high-quality and cost-effective alternative for software development by utilizing a combination of resources in the U.S. and overseas. It started by building software development centers in Viet Nam and India (and recently, a Denver office). Tham noted that although the quality of a product from overseas was very high from a technical standpoint, often the product missed the objectives of the U.S. company due to communication problems. Paragon Solutions uses people in the U.S. for the frontend work while the coding and testing is done overseas. The company has expanded to 240 people and has recently gotten involved with ERP software implementation. Pham, who does a lot of reading and traveling, lives with his wife in Glencoe, where they are expecting their first child. www.paragonsolutions.com

David Raddatz, BS'87, has been working on AIX performance for IBM in Austin, Tex., for the last three and a half years. Before that he worked on other IBM operating system platforms running performance benchmarks to evaluate system and application performance for both IBM customers and development. He is currently evaluating AIX performance within the SAP environment. His family includes his wife, Robin, and their three sons: Michael, Andrew, and Christopher (born June 3, 1999).

David Raddatz

Sharon (Zalabak) Theoharous, BS'87, was married to Mark Theoharous in November 1999. She is a manager at Andersen Consulting and a member of the Computer Science Alumni Board.

Kuan-Chien (KC) Chen, MS'87, PhD'91, is co-founder and VP of research and development for Verplex, a Santa Clara, Calif., startup company that makes formal verification software tools. Chen was previously with Fujitsu Labs.

See-Mong Tan, MS'91, PhD'99, joined **Zhigang Chen**, PhD'97, at Vtel in Sunnyvale, Calif. VTEL purchased Vosaic, the Internet video-streaming startup that Tan and Chen co-founded in Champaign, based on their graduate work. Tan is director of engineering and Chen is principal engineer.

Mark M. Towne, BS'90, and his wife Samantha (Cornish) Towne, BS Biology'91 and Ed'91, welcomed their second son Zachary Matthew Towne on October 16, 1998. Mark is a manager with Andersen Consulting in Chicago.

Brian Veatch, BS'93, was married in June 1998 to Angela Fehr, BS Ed'92. He is a senior programmer and analyst at Alltel Communications in Chicago.

Amy Ryan, BS'95, works for a special effects company, Rhythm & Hues, in Los Angeles. She has worked on the movies Babe2, Soldier, and recently, Mystery Men. eighmi@rhythm.com

Matthew Holliman, BS'96, is working at Intel's Microcomputer Research Labs in Santa Clara, Calif. His research interests include image and video processing, including digital watermarking and content protection.
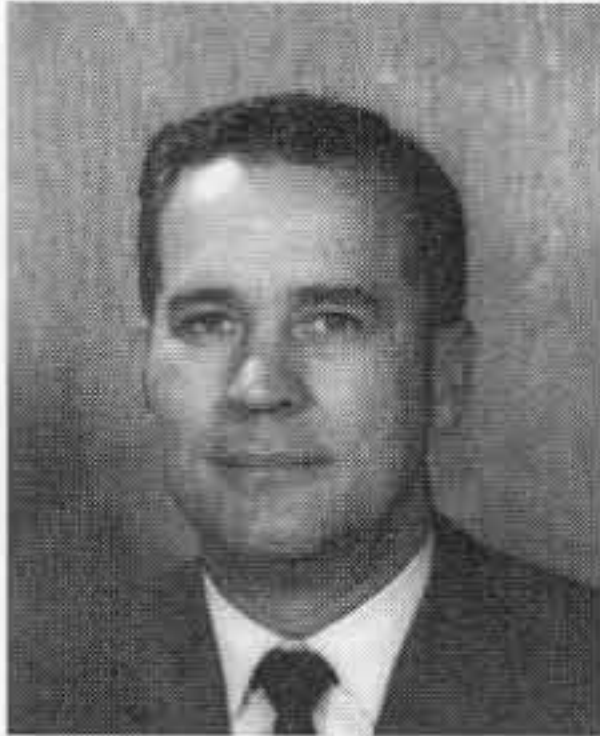
Jerry McCall

Jerry McCall, MS Math'56, PhD Math'59, came to UIUC from the University of Mississippi to work on something new. He started with an assistantship in the math department, then shifted to the physics department, where he began working in the Control Systems Laboratory as a programmer on ILLIAC I. In 1957, IBM hired McCall to install the system software for a 701 computer that the company intended to establish at Illinois. The computer design led to the IBM 704. McCall became IBM's applied science representative for the area. He then became executive vice president of Midwest Computer Services while finishing up his doctorate. He returned to the South to be near his family and worked for the Army Ballistic Missile Agency in Huntsville, Ala., with Wernher von Braun, eventually becoming his assistant. (Von Braun was one of the most important rocket developers and pioneers of space exploration. He was a major figure in the early days of NASA as director of its Marshall Space Flight Center.) Wanting to improve the academic environment in Huntsville, McCall was involved in the creation of the University of Alabama Research Institute, which later became the University of Alabama at Huntsville, where he taught mathematics. At age 39, McCall felt the urge to return to industry, so he went back to IBM as program manager of space transportation systems for six years before returning, once again, to Ole Miss. He was Executive Vice Chancellor of the University of Mississippi for three years before going to the National Data Buoy Center, which he would manage for 21 years until retirement. During his tenure, it became the leading data buoy center of the world. It is now an agency within the National Weather Service of the National Oceanic and Atmospheric Administration and is the focal point for data buoy and associated automated meteorology monitoring system technology. During his career, McCall built up a variety of commercial enterprises in Gulfport, Miss., which he still manages. He and his wife, Margaret, have three children and four grandchildren.

Anne (Kerkhover) Holt, BS'97, and Matthew T. Holt, BS'97, were married in September 1998. Both Anne and Matthew are programmers; Anne at Amdocs, in Des Peres, Mo., and Matthew at Alliance Systems and Programming, in Fenton, Mo.

Randy Lagman, BS'97, BS Psych'97, was married to Allison Corrinet in June 1998. He is a senior programmer at Reuters Information Technologies in Oak Brook, Ill.

John J. McGowan, BS'97, was married to Elizabeth Johnson, in July 1998. He is a software engineer at Motorola in Arlington Heights, Ill.

Anthony Petrovich, BS'98, was married to Danielle Besenhofer, in October 1998. He is a software engineer at Motorola in Arlington Heights, Ill.

Charles D. Schultz, BS'98, was married in May 1999 to Heather Grush. He is a research programmer for Administrative Information Technology Services at UIUC.
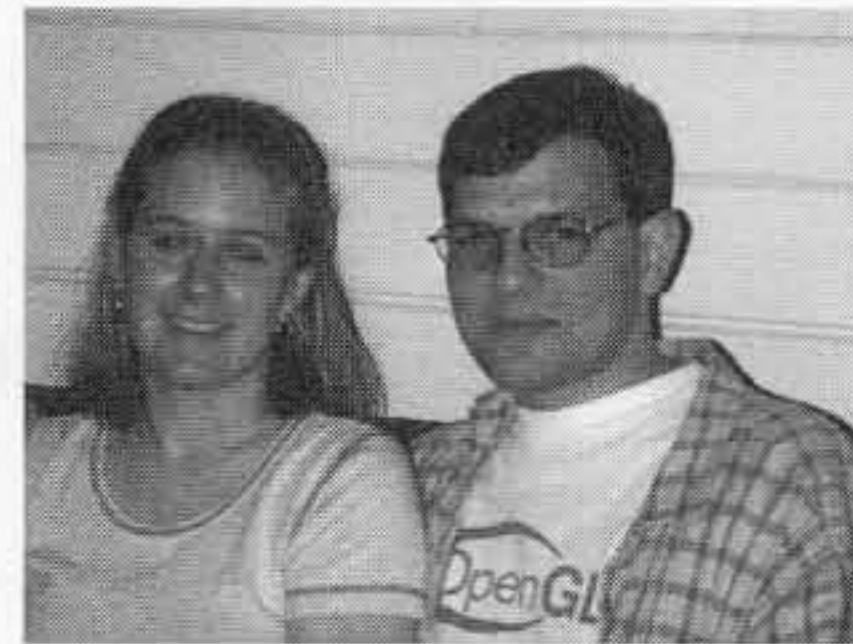
Christy and Paul Bleisch

Christy Schumacher Bleisch, BS'98, was married in June 1999 to Paul Bleisch, BS CompE'97. They live in Austin, Tex., where she works for Trilogy and he works for Digital Anvil. ACM alums at the wedding were Jay Kreibich, BS'96 (CCSO at UIUC); Ryan Musgrave, BS'98 (Arthur Andersen); Eric Adams, BS CompE'95 (Lante); Greg Kaiser, BS'98 (Green Hills Software); Mark Ashton, BS'99 (Motorola); Phyllis Jones, MCS'96 (ITDS) and husband Joel Jones (current grad student); Vic Adukia, BS'98 (Motorola), Ari Pernick, BS'99 (Microsoft); Joe Gross, BS'96; David Jeske, BS CompE'96 (eGroups); Brandon Long, BS CompE'95, MS EE'97 (eGroups); David Morgan, BS CompE'97 (SGI); Paul Watts (Microsoft); and Jeff Thompson, BS'96 (Argus Systems Group).

Jeffrey J. Wall, BS'98, and Krista Kolaz, BS CivilE'98, were married in November 1998. He is a software design engineer at Microsoft in Redmond, Wash.

Brian Runk, BS'99, has been in a local band, Beazus, which broke up in December 1998 after releasing two full-length records. Brian was a guitarist. Incidently, another member of the band, Joy Gadrinab, was the designer of our famous Digital Corn t-shirt! Brian now works for Morgan Stanley Dean Witter in New York.

In Memorium

Steven Edward Makulec, BS'70, passed away on May 11, 1998. A Vietnam veteran, he was a systems/production engineer for Woodward Governor Co. in Rockford, Ill. He is survived by his wife Judi Makulek, BS Math'70.

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