



Alma Mater

Shown here are mock-ups of the two mousepads which will be available. On the actual mousepads, the University of Illinois will be written in vivid orange. And unobtrusive text on the bottom will have our organization name, the Computer Science Alumni Association, and a brief description of the picture. They are of extremely high quality and feature vibrant colors. One is the stately Alma Mater statue, and the other captures the beauty of autumn leaves on the Quad. They are available exclusively from us as 7x8.5-inch Velvet Lexan on a 1/8-inch thick rubber pad.

This is the first step in our bringing the U of I to your computer. Watch for our Larry Kanfer screensaver, currently under development.

See back page to order. *Makes a great gift!*

Acronyms, schmacronyms

There have always been a plethora of acronyms related to computer science. And now, with networking, another tidal wave of acronyms have flooded onto the scene. In the spirit of efficiency, I've included a list of most of the abbreviations used in this newsletter on the back page.

—The editor

Bring the U of I to your computer

The Computer Science Alumni Association is proud to offer University of Illinois mousepads, featuring the work of photographic artist and U of I alum Larry Kanfer. Kanfer maintains a studio and gallery in Champaign, and his work is recognized throughout the country as capturing the essence of American landscape. He has three critically acclaimed books of photographs and produces a yearly calendar. We are extremely grateful for his support for the computer science department.



Changing Seasons, Changing Classes

CS grads find growth, challenge at Andersen Consulting

submitted by Andersen Consulting

We, at Andersen Consulting, are proud to sponsor this issue of the Computer Science Alumni News.

Andersen Consulting is committed to helping our clients change to be more successful. We are recognized as the leader in business integration, the process by which we meld the client's strategy, people, processes, and technology. To help us fulfill our mission, we hire

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What do our graduates need to know?

Alumni questionnaire aims to find out

by Tom Burke and Chuck Boyle

The general trend in computer science is toward better human interaction, higher levels of abstraction, and greater dispersion of data and work. Tomorrow's CS major will manage a greater variety of resources and be less involved in the detailed workings of each one. We believe there will be a shift in emphasis from mechanical skills to creativity, judgment, and resourcefulness. We need your advice on how to prepare our students for these changes.

The CS alumni board and the CS department are conducting a survey of the undergraduate alumni to get your input on our current curriculum and your advice on what direction it should take. A third of our 3,485 undergraduate alumni were randomly selected for this survey, so that we could conduct additional surveys without burdening any individuals. If you don't receive a survey by the end of October and are interested in volunteering to complete one, contact Judy Tolliver at the department. Graduate alumni are welcome to a copy of the survey but may not find it applicable to their program.

The first section of the survey attempts to identify what parts of our program were of the most value in your career. It asks about CS classes, goal-directed sequences (minor), undergraduate requirements, and general skills. Discussions with industry often identify new material that can be added to the program, but this information should help with the less rewarding task of pruning non-essential material from the current curriculum.

The second section of the survey deals with faculty accessibility and the quality of advising. By combining this with other information, we may identify subgroups in the department that are underserved or periods in time where our enrollment exceeded our resources.

The third section gathers demographic data. It is important to know what type of work our graduates do, whether they pursue additional education, and whether they use CS as a springboard to other areas. Are we expected to launch their career or provision them for the next forty years?

The fourth section gives you an opportunity to express your ideas on how we can better prepare students for your industry and what new areas of teaching or research we should pursue. As part of a publicly funded institution it is important for our department to be responsive to the needs of industry.

A group of volunteers from the CS alumni board will tabulate the surveys and provide the results to the department by the end of the semester. All comments will be read by the department head and the undergraduate director. Your recommendations will be supplemented with information on undergraduate requirements at other schools and presented to the faculty in February. Survey results, recommendations, and possible actions will be described in our spring newsletter.

Your ideas will have an immediate impact on undergraduate advising, and may influence course content or faculty recruiting. Curriculum changes are carefully reviewed, but you can definitely provide a strong push to any ideas that are already in the pipeline (or help get new ideas started). The more of you who respond, the harder we can push!

Tom Burke (MCS'86) and Chuck Boyle (BS'84) are CSAA board members.

Deck yourself out in corn

It's fall in Illinois and farmers are out combining their massively parallel rows of corn—every kernel bound for the silo. What better attire than the new CS digital corn t-shirt when improving the grainularity of *your* computation?

It is shown here modeled by the department's second graduate and former CSAA board president Fontaine Richardson (PhD'68). Richardson is president of Eastech Management Co. Inc. and founder of Applicon, now part of Schlumberger. He won the College of Engineering's Alumni Honor Award for Distinguished Service in Engineering in 1992.

The festive shirt is high quality 100% cotton in white with a digitized image of green and yellow corn and the legend "Digital Cornputer Lab, Department of Computer Science, University of Illinois at Urbana-Champaign." To order, see back page.



Fontaine Richardson

As part of my usual fall rituals, I have been preparing my "State of the Department" report again this year. I do this every year, for presentation to the faculty, the Dean, and various advisory bodies, and concentrate on a different aspect of our department each year. This year the budget was one area of concentration because of the trends over the past few years. Even I was surprised by what I found.

Each year, we learn of new "taxes" and "reallocations" (euphemisms for budget cuts). I decided to add these up for the past five years. What I discovered was that we have lost the equivalent of about twelve faculty positions. These cuts have been carried out across the campus, and much of this money went to retaining the excellent faculty we have. Fortunately we were able to get about four of these positions back through arrangements with other campus units (CSR and NCSA), but the loss of even eight faculty is serious. The department now has 40 faculty which still makes us one of the largest in the country. (And yes, we are still one of the best, ranked in the top five by U.S. News and other organizations.) Size is important to us because it allows us to offer a broad spectrum of subjects in a field whose scope is growing at a phenomenal rate. But like everyone else, we are "rightsizing," and the process is painful.

We are taking steps to get leaner. For example, we are adopting more modern printing and copying equipment. Thus instead of laying things out on a computer, printing a copy, taking that copy to the copy center and having a staff person make multiple copies, we have purchased equipment that makes it economical to print multiple copies directly from the computer. We are also reducing

support staff through attrition. And we are looking at ways to reorganize our library in light of the fact that we now have the new \$20 million Grainger Engineering Library and Information Center just across the street.

While we are losing staff, we are still improving our programs. For example, last year we completed the first year of our Senior Projects course under Professor Ralph Johnson. This course gives seniors an opportunity to participate in team projects proposed by our industrial friends, and provides a rich experience in real design problems while still under the guidance of departmental faculty. Students have been extremely enthusiastic about this program, and we plan to enlarge it in the future. (We are always looking for good projects, too. If you or someone else in your company has an appropriate project for small teams of students, contact me or Ralph Johnson.)

Another new feature of our undergraduate program is an early introduction to computing through CS 100. Many of you remember Engineering 100. We now offer CS 100, an introduction to the profession of computing. The course features talks given by visitors from industry and others. Professor Mike Faiman is in charge of that course, and if any of you plan on being in town and think you might be able to talk to these students, please contact Mike.

Overall we still have a strong, vigorous department—one of the best in the country. And the faculty are dedicated to preserving that strength. Let us hear from you. What do you think are our best strengths and worst weaknesses?

—Duncan Lawrie, department head



Still in the dark about Mosaic?

For those of you who still don't know about Mosaic: Mosaic is a browser, a program that retrieves and interprets documents on the World Wide Web. It is a client of the many Web servers on the Internet. The World Wide Web (WWW, the Web) is an information space that contains hypertext documents and links between documents. These links allow users to jump from one document to another by simply clicking on highlighted hypertext words. Documents found through Mosaic can contain multimedia and graphics as well as text. Web documents are written in a high-level programming language called HTML (HyperText Markup Language). This formatting language makes it possible to include hypertext links and references to other media within documents. HTTP (HyperText Transport Protocol) is the language that Web clients and servers speak. It is used to send and request hypermedia documents. So the Web

can be thought of as a collection of HTTP-speaking clients and servers on the Internet. A URL (Uniform Resource Locator) is the address of a document on the Web. To use Mosaic, one needs something like a SLIP (Serial Line Internet Protocol) or a PPP (Point to Point Protocol) connection from an Internet vendor. These connections make your desktop PC look like it is physically attached to the network, when in reality you're just connected through phone lines. A free version of Mosaic is available from NCSA's anonymous FTP server, <ftp.ncsa.uiuc.edu>. Its features are described in the Winter 1993 CS Alumni News, available online from the CS department's home page at the Web address: www.cs.uiuc.edu. A home page is usually the first page of a Web document. It is like a launch pad containing a menu of possible destinations.

Illinois's Boys Make Noise And they're doing it with Mosaic

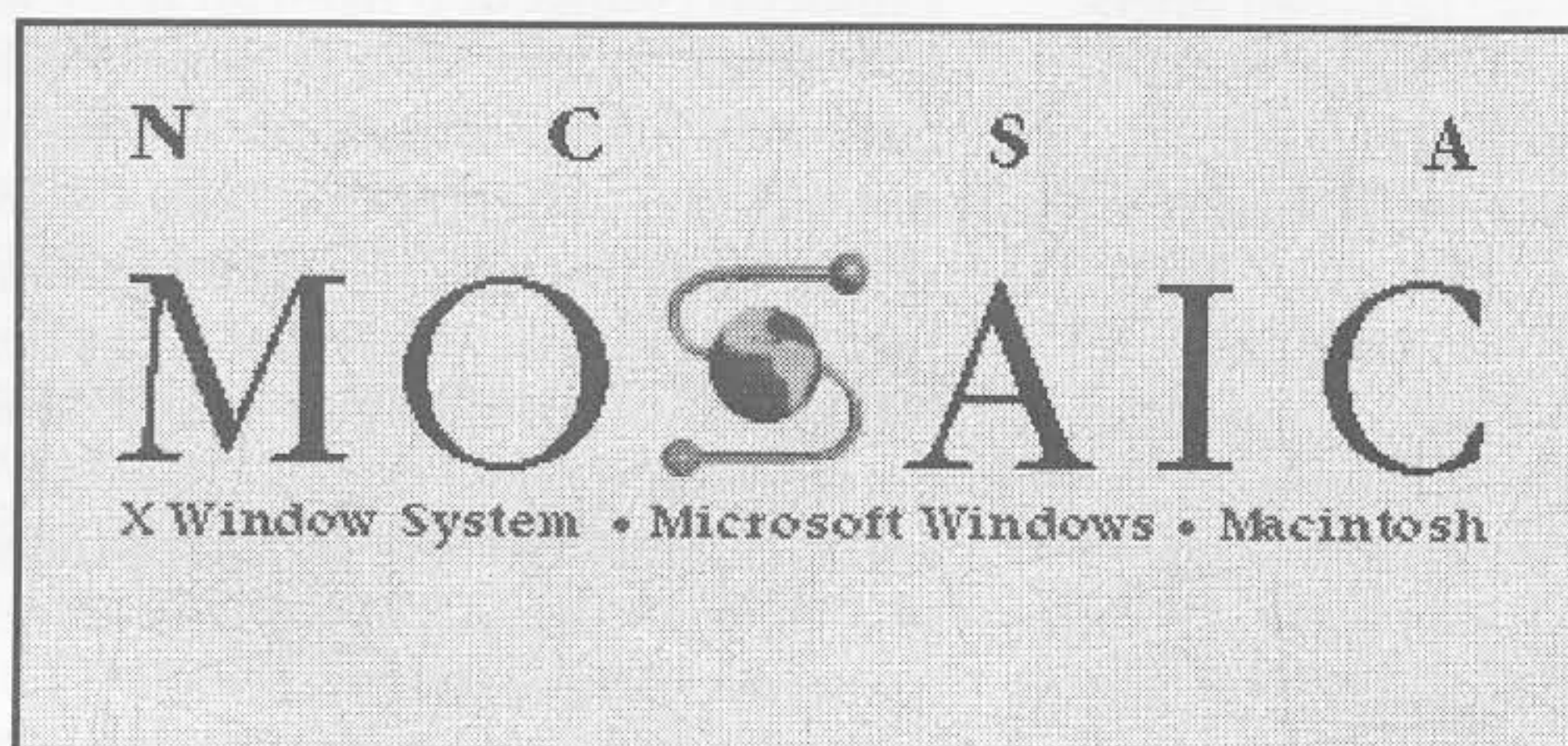
Because Mosaic was spawned at Illinois, it is only logical that Illinois graduates are represented in some of the dozen or so companies that are clamoring to develop it commercially. Here we look at alumni in three such companies: Mosaic Communications, Spry, and Spyglass.

Author Howard Rheingold, 1994 winner of the Global Network Navigator's "Best of the Net" award, offered the following definition of the Internet: "When it comes right down to it, the Internet is a bunch of really cool stuff delivered to the world for everyone to share by a bunch of really cool people." One bunch hails from Illinois, and with Mosaic,* this bunch is turning people on to the Net in droves. It is estimated that at least 1 million people currently use Mosaic.

Mosaic is a browser for the World Wide Web developed at NCSA as a research prototype. Mosaic was originally written in the context of a supercomputing environment, with little consideration paid to bandwidth constraints. Companies are now working toward making Mosaic more usable and commercially robust, along with providing user support. Could this mark the beginning of a possible world standard interface to electronic information? Several Internet pundits have compared Mosaic to VisiCalc, the first electronic spreadsheet for PCs. Indeed, it is possible that Mosaic really is "the VisiCalc of the Internet," "the VisiCalc of the '90s." And possibly we are on the cusp of another revolution in computing that will transform the way we interact with information.

Mosaic and its developers have hit the big time—their names sprinkled throughout the media as their stories have been covered by the New York Times, Wall Street Journal, San Jose Mercury News, Newsweek, Time, Wired, and a host of other computer magazines. When last we reported here, Mosaic was still solely in the hands of NCSA. What happened? In a nutshell, almost all of the core team of developers now work for the newly formed Mosaic Communications Corp., headed by Jim Clark, founder and former chairman of Silicon Graphics Inc. Another of the original team works for Spry Inc., which came out with the first commercial version, called Air Mosaic. And a local company, Spyglass, has recently formed a commercial venture with NCSA and offers Enhanced NCSA Mosaic. (About a dozen companies hold licenses to NCSA's Mosaic. Are there any more U of I alumni out there?)

Mosaic and its offspring should help put the University of Illinois on the software map in the minds of the masses. To borrow from an orange juice commercial: "Computer science at Illinois: It's not just for hardware anymore!"



The relaxed and open environment enjoyed by software developers at NCSA provided fertile grounds for the creative work that led to Mosaic.

*As used in this article, Mosaic refers to NCSA Mosaic.™

Mosaic to Mozilla!

Mosaic Communications Corporation is a new company started by Jim Clark and Marc Andreessen. It was Andreessen and six other former CS students and NCSA employees who created Mosaic, now commonly known as the "killer app" of the Internet. Clark, a former Stanford University professor, founded Silicon Graphics, Inc. (SGI), a leading workstation provider. The new company is based in Mountain View, California. Its immediate goal is to develop a commercially robust Web client.

When the last issue of this newsletter came out about six months ago, there were no companies developing Mosaic, and Mosaic's creators and developers were either students or employees of NCSA or both. Things are different now.

First of all, here are the major players who made up the core Mosaic team at NCSA and what their status was at the time (circa 1992):

- Marc Andreessen (BS'93) was an undergrad when he co-wrote the first version of Mosaic, for UNIX/X Windows, with Eric Bina.
- Eric Bina (BS'86, MS'88) co-wrote the first version.

- Aleks Totic, a grad student, ported Mosaic to the Macintosh.
- Jon Mittelhauser (BS'92) was a grad student. He and Chris Wilson ported Mosaic to Microsoft Windows on the PC.
- Chris Wilson (BS'92) ported Mosaic to Windows.
- Rob McCool, an undergrad, did the HTTP development.
- Chris Houck (MS'92) did most of the cross-platform work, but claims that in reality he "kept everyone reasonably sane with lots of late night coffee and beer runs."

Of these seven, all but Chris Wilson, now work for Mosaic Communications. Three more Illinois programmers would join Mosaic Communications, but more on that later.

It was a dark and stormy night... Actually, it was just dark when the seeds for Mosaic sprouted in the minds of two friends and NCSA co-workers Marc Andreessen and Eric Bina. The two shared space in the basement of the Oil Chemistry Building, a small, odd-shaped building on Sixth Street behind the main edifice of NCSA, and both were in the habit of working late night hours. Andreessen was an undergrad while working on resurrect-



Chris Houck, Aleks Totic, Marc Andreessen, Jon Mittelhauser, Jim Clark, Lou Montulli, and Rob McCool.

Andy Freeberg



Eric Bina

ing a visualization program called Polyview. Bina had already graduated and was working on Collage, a real-time collaborative work program.

That night in November, 1992, while speculating on what the future of computer science might be like, Andreessen asked Bina if he had ever seen the World Wide Web. No, he hadn't. Andreessen explained what it was and showed him the few existing Web clients that he knew about, Midas and Viola. They explored the Web and started getting "all sorts of wonderful ideas about what could be done with it." There was a definite air of excitement. After about an hour, though, the limitations of the Web clients became all too apparent. Simply put, they were not fun to use. Hey, they thought, perhaps *we* could write something to do all those wonderful things.

At that time, each had their own vision of where they were heading. Andreessen was

very much enamored by virtual reality and the possibility of navigating through three-dimensional information space. Bina, on the other hand, was into intelligent agents. "There's all this information," he said, "and there's more and more every day. The basic problem is filtering. Here I am using my brain as an expensive information filter. A computer could do this for me. It could know the 27 criteria that I use to see what interests me. A program could do this tirelessly and faster than I could."

Andreessen and Bina decided to write a Web client. Their working relationship was perfectly meshed. After they divided up the necessary tasks to pull it off, each thought the other had the more daunting job. Andreessen would handle the networking stuff; Bina would handle the X Windows stuff. They started the actual coding in December, and by March they had come up with a workable client that already surpassed anything that was currently out there.

During these days and nights, they worked on what was to become Mosaic in addition to other NCSA tasks, and in Andreessen's case, in addition to school work as well. Initially, few knew, or were even interested, in their new project. And when they showed off their first result within NCSA, it was met with little more than raised eyebrows. At that time it was impossible to anticipate the enormous success it would become. As is so often the case, it took interest from the outside to spur interest inside. "Lots of word of mouth was involved," notes Bina. When it became popular, as indicated by the number of downloads requested of NCSA's FTP server, everyone involved quickly recognized the importance of Andreessen's and Bina's efforts.

Between the time Andreessen and Bina first formally unveiled and demonstrated their program to NCSA and the time NCSA signed on to it, Andreessen had already gotten the PC and Mac programmers, also housed in the Oil Chemistry Building basement, fired up about it. NCSA eventually relieved the young developers of their regular duties and let them blast full speed ahead with Mosaic.

The name Mosaic was the result of a brainstorming session at NCSA (it was almost called Montage). According to Bina, the name

was to represent the idea that the Web is a single picture made up of many parts (HTTP, FTP, Gopher, News, WAIS, etc.). Mosaic floated along at NCSA, its popularity growing at an exponential rate. Members of the team had a vague idea that they really should be exploiting the program commercially, but none had a clue to how to go about it. Eventually, they began to graduate and take jobs. The first to leave was Chris Wilson, who went to Spry in Seattle. Then Andreessen went to Enterprise Integration Technologies in Palo Alto. (Both of these companies are in the race to commercialize Mosaic.)

Enter Jim Clark. Clark had left SGI in January, 1994, with the vague intention of starting a new software company, perhaps involving interactive television. On his last day at SGI, colleague Bill Foss showed him a new program he found. That was Mosaic. Clark was smitten, and he took note of a Mosaic page showing Andreessen and where he was. Andreessen then received an e-mail message from Clark asking to meet. The two hit it off immediately. "He was one of the sharpest people I had ever run across," Clark told the San Jose Mercury News. "His vision, knowledge about markets and ability to execute were right on target." Like a runaway train, things started really moving from there.

Clark thinks highly of Illinois. "The computer science department at the University of Illinois is probably the top department in the world. I've known many people from there over the years, including the original networking expert at Silicon Graphics, Greg Chesson (MS'75, PhD'77), and Rick Schell (MS'77, PhD'79). The department has been known for many years for supercomputers, parallel compiler technology, networking, and with NCSA, applications for supercomputing and high-speed networking. In overall perspective, over the last twenty years, the department is best—beats Stanford, MIT,

CMU, Berkeley, etc. in the computer systems area, hands down."

It didn't take long for Andreessen to agree to form a company with Clark. Clark asked Andreessen who the best people he could get on board were, and in a flash they were both on a plane heading for Champaign-Urbana. Clark explains: "Marc and I hatched the idea over a weekend, and on Tuesday, we were on our way out there. I almost backed out, due to thunderstorms and flooding in Urbana, but Marc thought we would be okay. We got there late at night, after having burgers in the Chicago airport. The next morning I met the group, which included Lou Montulli, who flew up from Kansas. Lou had implemented Lynx, and most of the guys only knew him through the Internet. [Lynx is a popular text-only browser.]

We went to a local pizza place for lunch. You know the place—beer, pizza. The thing I most remember is the way all of the guys were so glad to see Marc again. Marc had been a pretty modest guy, so I wasn't sure of his role. After seeing their reaction to him, I realized he was a leader of a lot of the Mosaic effort.

We got to know each other through the day, and that night I faxed their job offers to our hotel's fax machine. They signed the letters. And they all signed some NCSA Mosaic sweatshirts to give each other. We had a beer, and agreed for everyone to get to California as soon as possible to get underway." The very next day, the group resigned from NCSA. (At that time, Chris Wilson was already at Spry.)

These seven, Andreessen, Bina, Houck, McCool, Mittelhauser, Totic, and Montulli, were joined by a number of top-notch engineers from SGI to form Mosaic Communications in May, 1994. In July, Mosaic Communications had 18 employees. It has since expanded to over 50 as sales and marketing people have been hired. Three more Illinois people were to join up: Rob McCool's twin brother, Mike, who is also an undergrad in CS, and two more former NCSA employees

Jim Clark is no stranger to Illinois. He was responsible for NCSA's Renaissance Lab, a lab filled with SGI's advanced graphics terminals. This contribution has greatly increased availability of such machines for student use. Previously, only several of these machines were on campus, and they were dedicated primarily to research.

who oddly enough both happened to be in California at the time, Mark Lanett (BS'92) and Tim McClarren. Rick Schell (MS'77, PhD'79), formerly of Sun Microsystems, is vice president of engineering at Mosaic Communications. Not everyone lives in California: Rob and Mike McCool still live on campus finishing up their degrees, and Eric Bina, whose fiancée is computer science professor Marianne Winslett, all telecommute. Bill Foss, the person who gave Clark his first peek at Mosaic, is now head of Mosaic Communications's content division. Among the former SGI engineers are Jamie Zawinski, who wrote Lucid Emacs and Ari Luotonen, who wrote most of the HTTP Daemon for the CERN* Web server.

"We now have ten people who got their original training [at Illinois]," says Jim Clark. "They are the core of the company—it is formed around them, led by Marc Andreessen. Their teamwork is incredible, and I feel privileged to be a part of them. The market they pioneered at the university is exploding. They are defining electronic media, the Internet, and electronic commerce."

When asked if he recognized anything in common among the Illinois guys that he could attribute to some sort of Midwest sensibility, Clark replied, "Yup. Sensibility. Everyone's grounded and doing what's necessary to get the whole job done. In reality, everywhere in the world, everyone who is good does about the same good job, but there is something special about the people from the Midwest. They just seem to do it and think it's part of everyday life, rather than something special."

September 12, 1994, was a big day for the young company. On that day, Mosaic Communications announced its first products: a network navigator called Mosaic Netscape, and a server line called Mosaic Netsite.

*CERN (a French acronym for Conseil Européen pour la Recherche Nucléaire, now called the European Particle Physics Laboratory) is the birthplace of the World Wide Web. The original Web programmers were led by Oxford graduate Tim Berners-Lee.

Also on September 12, at the Interop 94 trade show, Sun Microsystems and Mosaic Communications announced that they would collaborate on new security technology aimed at accelerating electronic commerce. Sun's SPARC/Solaris workstation and server family leads the UNIX market. Andreessen felt that the Sun collaboration was a logical partnership in part because of the large portion of Internet traffic currently passing through Sun servers.

Mosaic Communications is working non-stop on its next generation client, which is code-named Mozilla. The crazy working schedule harks back to NCSA days. When asked to describe the difference, Totic says, "We have a bigger office here, and we are not in the basement any more. Other than that, it is just the same guys working 'round the clock . . . Oh yes," he adds, "we miss the intense arguments we used to have at NCSA."

"An incredible group," said Jim Clark when asked to describe the Illinois guys. "Some are stable and centered, and they will be great managers or engineers. Others are brilliant, and are manageable only if they agree with what is going on. But all are dedicated to success and working as a team. During the first intensive five months, they worked as a team with very little management—only coordination and some direction by Marc Andreessen.

Nothing is guaranteed in life, but they are building a great company. I really feel privileged to be part of this."

Reach the best!

Would *your* company like to sponsor this newsletter? This is an excellent way to reach over 4,300 Illinois alumni in computer science and over 1,000 current graduate and undergraduate computer science students. Contact the computer science department for details.

First to fly: SPRY

Chris Wilson (BS'92) has the distinction of being the only member of the core development team of Mosaic at NCSA that did not join Mosaic Communications Corp. When that company was formed, Wilson was already making strides at Spry Inc., a provider of Internet software.

Originally in computer engineering, Wilson switched to computer science after thoroughly enjoying his first several programming courses (especially CS 121 with Professor Ed Reingold). In the beginning of his junior year, Wilson got a job with NCSA and worked there on NCSA Telnet for DOS for about six months. He then worked on scientific visualization and sonification tools. When the Mosaic project came up, he became the project leader for all DOS and Windows development, in addition to continuing his other work. After graduation in 1992, he stayed on at NCSA and began working with Jon Mittelhauser on porting the UNIX/X Windows version of Mosaic to Microsoft Windows on the PC. "I had a lot of fun working there," Wilson remarked. "It wasn't very structured, which was good and bad. The good part was that the atmosphere allowed exploration of all kinds of ideas." In early April, 1994, Wilson signed on with Spry as a senior engineer, and he moved to Seattle with his wife Jennifer Cole (BS Psych'92) that summer.

In August, 1994, Spry introduced Air Mosaic, the first commercial program based on Mosaic. Air Mosaic is a part of the Air Series, from Spry, which is a collection of software necessary to access the Internet from the PC Windows platform. In addition to Air Mosaic, the series includes things like Telnet, FTP, SMTP Mail, News, and Gopher. It also includes a system called RAMP (Remote Account Manage-

ment Protocol) which functions as an entrance ramp to the Internet by automatically setting the user up with an account with one of the Internet providers, such as Novx Interserve.

Spry's newest offering is Internet-in-a-Box, a package for PC users which includes a subset of the software in the Air Series, and two books, including a special edition of Ed Krol's (BS'73) Whole Internet User's Guide and Catalog and an online magazine called Global Network Navigator. The shrink-wrapped package will be available at bookstores for about \$100 and is designed to appeal to people who may have been intimidated by the complexities of Internet navigation.

Down the street at Spyglass

Tim Krauskopf (MS'87) has co-founded a company practically down the street from the U of I. Spyglass Inc., in Savoy, is also in the Web client business and it will now handle all future commercial licensing of Mosaic for NCSA. Spyglass currently offers Enhanced NCSA Mosaic 1.0 for Macintosh, Windows, and UNIX, and plans to offer Release 2.0 by the end of the year. Despite the agreement with Spyglass, which was begun last May, the free version of NCSA Mosaic will still be available to individual users. According to Newbytes, the Spyglass-NCSA deal gives Spyglass the right to enhance, commercialize, and broadly relicense Mosaic. Spyglass hopes to develop a Mosaic version that other companies can incorporate into their own products. So far, new licensees include IBM Corp.'s Network Software Division, FTP Software Inc., O'Reilly and Associates Inc., and Firefox Inc. And last spring it was announced that Digital Equipment Corp. will incorporate Spyglass's version of Mosaic across DEC's entire line of platforms.

Krauskopf works as director of development for the four-year old Spyglass, which currently employs about 20. He first came to UI in 1986 after earning a BA in integrated science from Northwestern University. He started working for NCSA after only one semester of graduate school. "It was the perfect mix of computers, my first love, and science, my second," he said. He wound up working for NCSA for four years, during which he earned his MS. "Working at NCSA was a great match for me," he explained. "My major project at NCSA was NCSA Telnet, which I originally wrote for DOS. This also became my master's thesis project under Dr. Jane Liu in CS. Now NCSA Telnet is in use at practically every university in the country for connecting PCs and Macintoshes to campus networks." Krauskopf also wrote NCSA Datascope, a science program. The idea behind Spyglass was to bring Datascope and the other science programs at NCSA to the commercial market.

Eric Sink (BS'90) is the lead engineer for Spyglass's Windows version of Mosaic. After Sink graduated, he spent ten months in Spain as a researcher at the Technical University of Madrid. He returned to the U.S. and worked for USA-CERL as a programmer for GRASS, a Geographic Information System developed by the Army Corp of Engineers. Then he started at Spyglass in May, 1992, where he has actively worked on projects for all three of their supported platforms. Sink reports that every developer at Spyglass has at least two machines, one slinky (the coily toy), and perhaps a kooshball, and that competitive bridge and Gumby's pizza are *de rigueur*.

Spyglass plans to expand and move its corporate headquarters to Naperville, Illinois, in November. It will retain its software development organization in Savoy.

Loyal Japanese alumni gather to remember UI days

by Professor Saburo Muroga

In May, 1994, we formed the Computer Science and Electrical and Computer Engineering Division of our Alumni Association of the University of Illinois in Japan. The division's president is Toshiro Kunihiro (MS EE'59), who was senior executive vice president of NEC Corp. until last year and is now president of NEC's subsidiary. He is currently undertaking the task of forming committees within the new organization. Unlike alumni associations of other universities, such as Harvard's or MIT's which started more than 70 years ago, the Alumni Association of the University of Illinois in Japan is very new. It was formed only about 15 years ago, but it already has the largest number of members, more than 1,000. Preparing and maintaining a complete directory of members has been extremely difficult. So, we decided to start a new group. In the College of Engineering, the Department of Computer Science has more than 200 Japanese alumni and former visiting students. In addition, we receive many visitors from Japanese corporations and government agencies.

The first division meeting was held in Kyoto on May 21, 1994. It was arranged by Professor Yahiko Kambayashi (visitor to department in 1971-73) and attended by ten. The second was held four days later in Tokyo. It was arranged by Kunihiro and Professor Kenji Naemura (visitor in 1967-69) and attracted 50. These were very exciting meetings. I met



Professor Muroga in front of a scroll which reads "Lucky Cloud."

some people for the first time in 20 years. Some knew each other through professional meetings but did not know they had studied on the same campus. The majority are very active as technical or business leaders on international front lines. Our education has helped different people in many different ways. Toshiro Kunihiro is a notable example of an alum who reestablished his career brilliantly through our education. He left a career in design of telephone exchanges to become a senior executive VP of NEC, which grew to become a giant electronics manufacturer with an annual revenue of \$26 billion. Another, Ken Miura, joined Fujitsu after graduation and, remaining in the U.S., has continued his frequent presence at international conferences as a representative of supercomputer research

in Japan. People who joined U.S. companies right after graduation or after spending some years with Japanese firms are indispensable to their companies as technical leaders who understand both cultures. For example, Toshio Yasui joined Japan IBM right after graduating in 1972. At age 42, he became the director of Japan IBM's Yamato Research and Development Laboratory, which houses some 3,000 researchers. He is executive VP of Display Technologies Inc., a joint venture of Japan IBM and Toshiba, which manufactures panel monitors for notebook computers. An example of an alum who joined a Japanese firm and later joined a U.S. firm is Masao Kato. Kato came here as a visitor from NTT (Nippon Telegraph and Telephone Corp.) in 1966, participating in the design of Illiac IV, returned to NTT in 1968, and four years ago joined Fuji-Xerox Corp., a company jointly owned by Xerox and Fuji Film. Now as executive VP, he works closely with Xerox in the U.S. Tak Kamae joined Hewlett-Packard Co. last year after spending 26 years with NTT. He is establishing a computer science research laboratory in Tokyo for HP. This year, Toshiaki Hattori joined Motorola in Japan after working with international communications carrier Kokusai Denshin Denwa Corp. An unusual example of an alum dispatched to Japan as an employee of a U.S. firm is Shigeki Makino. He is a second-generation Japanese-Ameri-



Alumni gather in Kyoto. Professor Kambayashi is second from left.

can who studied ECE and CS here and went on for his MBA at University of Chicago. With a rare background in hardware, software, and business management, coupled with his bilingual ability, he is involved in international activities in the financial and investment community. Recently, he appeared in the Nightly Business Report on PBS. The activities of these alumni and many others make us feel that the world is really becoming borderless. To my regret, due to the limitations of space, I am unable to mention many other outstanding careers. There are surely others that we are not even aware of.

At the meetings in Kyoto and Tokyo, I greeted our alumni and former visitors with the following message:

"As teachers we are always very concerned with providing the best education and research for students'

building up successful careers. We are very pleased with their success. As computer technology and the needs of students with computer technology background change, we need alumni feedback for further improvements of our education and research. Learning our alumni's development of their professional careers and observations is very important for our future education and research. Our alumni who gained a lot of experiences can greatly help us. Also, as the world is becoming an integrated market, our alumni will play more important roles in the future. As international cooperation and exchange of technology are becoming important, it is hoped that this division will be a good place for very effective communications among us. Also, when our faculty or other alumni visit Japan, friendly meetings could be arranged by the division."



Alumni in Tokyo. Mr. Kunihiro is second from left in second row, and Professor Naemura is seated second from right in first row.

Some Japanese alumni share their stories



Toshiro Kunihiro worked in the early days at DCL on the Illiac II. He went on to become a vice president of NEC Corp.

Toshiro Kunihiro (MS EE'59)

When I arrived at the small university town of Urbana, Illinois, in the early autumn of 1958, I was gradually overcoming the intense cultural gulf between Japan and the United States, thanks to a variety of orientation programs provided by the U.S. Department of State. I had come to America as a Fulbright exchange student in the middle of July.

I soon discovered that the "7 UP" written on signs at many restaurants was the brand name of a beverage and did not mean "we are up at 7 o'clock in the morning," cars that could run on highways in the sky as well as on surface roads on the ground, and that milk was not necessarily a nutritious medicine for the sick, but that a healthy person may drink it. I also learned that from the west coast to the middle of the North American continent it took more than three days by Pullman. I was impressed by so many towering stone buildings and was amused and confused by the twanging Great Midwestern accent. Many of these little things I saw and heard were nothing less than shocking to me. My first impression of America was more or less the same as that of most exchange students from other countries. One of my friends in the orientation course at the University of Kansas was so deeply struck with the differences that he returned to his home in Morocco.

Graduating from the Tokyo University with a BS in electrical engineering in 1952, I immediately joined NEC Corporation without any hesitation because NEC was, and still is, the largest telecommunication system manufacturer, and the best in telecommunication technology, in Japan. My first assignment was to establish quality control methods for an assembly line. Though the job had nothing to do with my major at the university, quality control was a new, systematic technique for factory management, and I enjoyed working

together with factory workers. However, after working in quality control for three years, I became frustrated at being unable to use my education and interest in electrical engineering. So I joined an English conversation club and dabbled in English conversation with friends at NEC to be relieved from the frustration. In those days most of the companies and universities in Japan had an English conversation club together with many other clubs such as a fishing club, baseball club, and so on. The manager of the English conversation club had told me about the Fulbright Scholarship, and added that the passing rate of the Fulbright examination was one out of three thousand. I decided to try. At the final oral examination an examiner asked me if I knew of Caltech, knowing that my interest was in electronics. I answered, "I'm sorry I don't know, but I know Cadillac." Then all the examiners burst out laughing. I really didn't know, and I was sure of my failure. The letter from the American Embassy informing me of my success filled me with joy. Actually, it made me more joyful than had the letter from the Tokyo University informing me of my passing the entrance examination. "I can go to the United States to study what I want, free for all expense, you know!"

So I came to Urbana. Why did I come to Illinois? First, I wanted to study computer technology because it was quite an unknown field for me and had something worthy of challenge. Second, the University of Illinois was the only academic institute which opened its computer research facilities to foreign students. Third, Professor Muroga recommended the University of Illinois. Frankly speaking, I could have gone to one of the big cities in the East rather than a small town in the Midwest.

At last, I settled down in a student apartment on West Main Street, which was a few blocks east of the Digital Computer Laboratory. Living as a graduate student and as a temporary citizen for more than two years broadened my experiences in many ways. Part of the lectures at the graduate college were to review what I learned at the Tokyo University,

but the lectures on computer technology in solid-state physics were quite new and gave me a basic understanding of rapidly advancing digital electronics.

In private citizen life, there were wide differences between the way of life in Japan and that in America. The most striking was, apart from good or bad, that American family life was focused on spouses or parents as a center while the Japanese family was focused on the grandparent as the primary center, with children being secondary. I thought this was very important and effective for bringing up children in the spirit of self-help under the changing social circumstances of the future.

My wife and I decided to follow the American way in bringing up our children. The result was partially a success and partially a failure. The children came a long way to become promising,

self-supporting young men. That was the success. However, it took unnecessary solicititudes, care, and time from us to call them back when they were about to run away from our hands. This was the failure. Anyway, all is well if it ends well.

I received an MS in June, 1959, and continued my study of basic computer circuits as a research assistant for Professor W. J. (Ted) Poppelbaum, in charge of circuit research at the Digital Computer Laboratory. Henry Guckel and Neil Wiseman were the senior members in the group. The Illiac II project was going on at that time. The project was a big one, which spent ten-dollar high-speed switching transistors like water. Professor Meagher and all the other staff warmly welcomed me. This year and a half at the lab was very fruitful for both my research and my personal relationships.

At the end of the summer of 1960, I left the United States for Japan. To tell the truth, I could have stayed there a couple more years and acquired business experience in an industry. Sometime before that, however, the sister

of my fiancée wrote a stern letter to me: "You wouldn't like to marry an *old* girl, would you?" I did nothing but return. As soon as I returned home, I married the *young* girl through the good offices of the sister and her husband. We have been happily married since then and have both gotten old. However, she is still four years younger than me, as she was when I married her.

Well, my business career at NEC Corporation after I returned home from Illinois became very different from the one I had been pursuing before I went abroad. The entire population of Japan in the 1960s was working very hard by the sweat of its brow under an

exchange rate of 360 yen per dollar in order to rebuild the country. Industries and livelihoods were so totally devastated by the war, and one could actually feel

that everything was getting better and better day by day. The national feeling, filled with freedom and hope for the future, was more tightly unified during this period than at any other time, during the war or before. The first job assigned to me was to develop a next-generation computer-controlled communications switching system (digital type) which was not intended to see the light of day in the near future. This was partly because the development of the current product (mechanical type) and the next-next generation product (analog type) were already assigned to someone else and there was no room for an engineer who wasted his time in America on the way, and partly because I had studied up-to-date digital electronics and computer technology in the U.S. The next-next generation system had a great potential to overturn the 100-year history of communication technology if it were realized. Only a few people in the world were studying such a system at that

The University of Illinois was the only academic institute which opened its computer research facilities to foreign students.

time. I remember the newly married engineer as being totally interested in the project and engrossed in his work.

Generally speaking, however, a digital system consumes a surprisingly large number of components. This can be easily understood by those who know about Illiac II. The story was the same for the communication switching system. The number of components required for a digital-type system was 100 times more than that required for the analog-type system. This made the commercialization of the digital type very difficult. I was impatient. Then, the discussion at the integrated circuit workshop held at the University of Colorado, Boulder, in the summer of 1959 supported my belief that the digital type would finally win. I attended the workshop with Ted to talk about a tunnel diode circuit. The system-side people argued that a poor yield would result from sealing many fragile semiconductors of widely varying characteristics in one package and that there was no way to realize precise passive components from semiconductors. The switching functions could be realized solely from transistors, no passive components would be required, and something could be done for better yield, the device-people responded. Jack Killby was the advocate in the device group. There was no conclusion at the workshop, but the discussion was clearly burned into my memory as an unsolved question. I asked the semiconductor group at NEC to make six-transistor-NOR chips and studied the characteristics of them. Finding the surprising fact that the characteristics of adjacent transistors from the same wafer were very uniform and identical, I was strongly convinced that integrated circuits could become a huge business. My conviction was realized by industry with unbelievable speed and scale. In the mid-1970s, the digital-type system with 100 times more components than the analog-type had become cost-competitive, and the next-next generation system I was developing suddenly became the star, truncating the product life of the current next generation system. My role in NEC became more important accordingly.

Finally, the recovery in domestic business was in sight, and the product was competitive in the international marketplace. I turned my eyes overseas. I had no sense of incongruity

with overseas countries because of my living experiences in America. Rather, the days of the exciting exchange among different cultures in America drove me to the world. NEC also encouraged me to expand global business.

The 1980s were ten years of advance into overseas markets as if the floodgates of my energy had suddenly broken open. I left my footprints on countries not only in Asia, South and North America, Europe and the Middle East, but also the USSR (then) and Eastern Europe, seeking only customer satisfaction. I constructed more than ten factories in many countries, transferred technologies to them, and pushed NEC up to one of the top telecommunications equipment manufacturers in the world. These were the best days of my life. It is more than delightful for me to see today that all of these plants are independently managed, prosperous, and the leading electronics manufacturers in each country. How lucky I am as an engineer!

Moreover, I have vividly experienced how many different races, cultures, and ways of life there are in the world. The cultural gap amongst them is far more intense than that between Japan and the U.S. It all started for me in Urbana in 1958-60; Urbana is the gateway to the world. I have met quite a few graduates of the U of I sometimes as a competitor or as a partner and at other times as a customer during those overseas business activities. They were mostly younger than me, but it was very joyful. Timothy R. Schrader (BS Management '64), former president of AT&T Japan, is one of them.

It worries me that the hearts of people are more and more apart from each other these days, irrespective of whether it is within fellow countrymen or among foreign countrymen, while the business world is getting closer and closer. The earth would be more comfortable to live on if people could understand each other directly through a common daily life in a different culture as I did at Urbana, rather than through accountable relationships in business or indirectly through the media. The Fulbright program, extended to many countries, has greatly contributed to the mutual understanding of the people of the world, and I thank the University of Illinois for accepting me under the program. Thank you again.

Shigeki Makino (BS'87)

In putting together an autobiography, I found myself searching for the few key experiences that helped me get to where I am now. In essence, time at the University of Illinois, co-oping at IBM and Andersen Consulting, and my Japanese background all provide complementary skills required in my profession. As one might imagine, while determining the factors is fairly straightforward, explaining them requires some patience.

Having grown up in Champaign-Urbana, my initiation to the University of Illinois in 1983 was not altogether a surprise. Further, having a keen interest in computers and electronics, computer engineering was a seemingly obvious choice of studies. With some classroom computer hardware experience in hand, I headed off for IBM in Burlington, Vermont. Later, realizing the benefits of exposure to both hardware and software, I switched from the electrical engineering department to the computer science department. In my ensuing co-op terms, I worked for IBM in Boca Raton, Florida and Andersen Consulting in Chicago. After graduating in 1987, I headed north to the University of Chicago for an MBA. In addition to a summer internship, I was lucky enough to land a permanent job at Fidelity Investments, a mutual fund company. In Boston, I was the analyst in charge of the PC software and networking industries, making buy and sell recommendations to our numerous portfolio managers. After roughly a year, I asked for the opportunity to work in Tokyo. Fidelity obliged, and I began my Tokyo career in 1991. After a couple of years covering the electronics sector in Japan, I was given responsibility for the Fidelity Japan Fund. Currently, this \$700 million fund is my primary responsibility. I spend most of my time visiting with the management of as many companies as my schedule allows throughout Asia.

As mentioned earlier, one of the key experiences which provided me with many of the tools I use today was my time in the computer science department. The challenging environ-

ment honed my work ethic and prepared me for a very competitive industry. Further, the problem-solving focus of computer science helped develop a skill that one finds useful time and time again. Of course, not everyone intends to make computer science their career. The computer science curriculum at the University of Illinois was flexible enough to accommodate many objectives, including my own. Hence, I took several finance courses while majoring in computer science. Still, the applications of one's engineering and computer science background are ageless. From the time I spent at the quantitative school, University of Chicago, to my responsibilities covering the PC software industry, and more recently my coverage of a high tech oriented economy, I find myself utilizing the knowledge and skills I gained back at the University of Illinois.

As I understand it, the cooperative work study program has drawn some criticism recently, but I can't imagine why. I thoroughly enjoyed my time at IBM and Andersen Consulting. The ability to apply classroom studies in a real world application was a great opportunity. Without a long term commitment, I was able to get a taste of DRAM development at IBM Essex Junction, PC software applications at IBM Boca Raton, and conceptualizing an object-oriented computer at Andersen Consulting Chicago. In addition to the fact that the time away from school enabled me to stay focused during my time on campus, the hands-on hardware and software experience enabled me to more fully understand the workings of both manufacturing and development companies. This appreciation is with me today as I analyze Asian firms on both sides of the fence.

During my four years at Illinois, I gained additional experience through a small company I created, Machtel. Essentially, I managed money for a few friends and relatives in a very conservative fashion. From high school onward, I had always had a keen interest in the stock market. I spent more time getting

As a computer science student, Shigeki Makino ran his own investment company. Now he manages Fidelity's Japan Fund.

quotes from my broker and watching Financial News Network than just about anything else. Thus, writing some software to track investments and doing some asset allocation was a lot more fun than work. This hobby turned into a profession when the University of Chicago surprisingly accepted my application for their Graduate School of Business.

MBA, co-oping, and computer science experience aside, there was a third and final factor that enabled me to get to the Japan Fund. My name probably gives it away, but I'm Japanese in origin. However, it's not the nationality that matters. What is important is the outward focus one picks up by being from another country. In a world that is quickly becoming borderless, the ability to quickly adapt to new ideas and customs is necessary. Americans have historically tended to impute our culture on others, but this is changing. Hence, I feel I had an advantage by being bicultural and having grown up in a culturally rich high school and a very multi-cultural and multi-racial engineering department.

That takes us to the here and now. Looking ahead, I hope to spend more time in Asia, perhaps in Hong Kong.

Tak Kamae (PhD EE'66)

I retired from NTT, a Japanese telecommunication carrier and started a new career with Hewlett-Packard in 1993. After I took a PhD from U of I in 1966, my career began as a research engineer with NTT in 1967. The biggest project I was involved in was the development of a facsimile communication network, which is now nicknamed F-net. From 1990 to 1993 I led its Human Interface Laboratories as the executive manager.

R&D work at NTT's HI Labs includes video compression/

decompression, video and image processing, speech recognition/synthesis, multimedia human interfaces, and human factors. Based on the discussions held at the labs, I organized the International Workshop on Networked Reality in May, 1994, in Tokyo. The workshop was very successful because we had good participants from many countries and very stimulating discussions. Multimedia, virtual reality and the information superhighway are really attracting attention in many countries.

In April, 1994, I joined Hewlett-Packard and began a computer science research laboratory for HP in Tokyo. I believe many people in Western countries wonder whether such a job transfer may happen in Japan, where people tend to work for their whole lives with one company. Frankly, many phone calls, faxes and letters came. Most of them asked why, and the rest congratulated me and my courage indeed! There was one call to ask how.

Our organization is called Hewlett-Packard Laboratories Japan (HPLJ) and is located in Kawasaki City, a southwest neighbor of Tokyo. My experiences at Champaign-Urbana helped me a lot to adapt myself to a U.S.-based company culture. I met people from different countries as well as many Americans on the campus. Such globalism in U.S. universities made my student life at Urbana enjoyable and also stimulating. HP is also cherishing such globalism. It is one of the reasons I like HP.

Toshiaki Hattori (student 1978-88)

I was at U of I for only two semesters, from 1987-88, as a grad student with a one-year sponsorship from KDD (Kokusai Denshin Denwa Ltd.). Unfortunately, I couldn't receive an MS degree in that year. However, I learned the spirit of a pioneer to challenge new things during my

school days. That's why I resigned from the "stable" international telegraphy and telephone company (KDD) and joined "dynamic" Nippon Motorola to seek out more challenging jobs. I am now managing the System Testing group for cellular systems in the Japanese market. Our job is to integrate the various subsystems together and then system-level test the functionality and stability of a software system release package from the customer's point of view. I would like to contribute to Motorola's success in Japan keeping the spirit of U of I in mind.

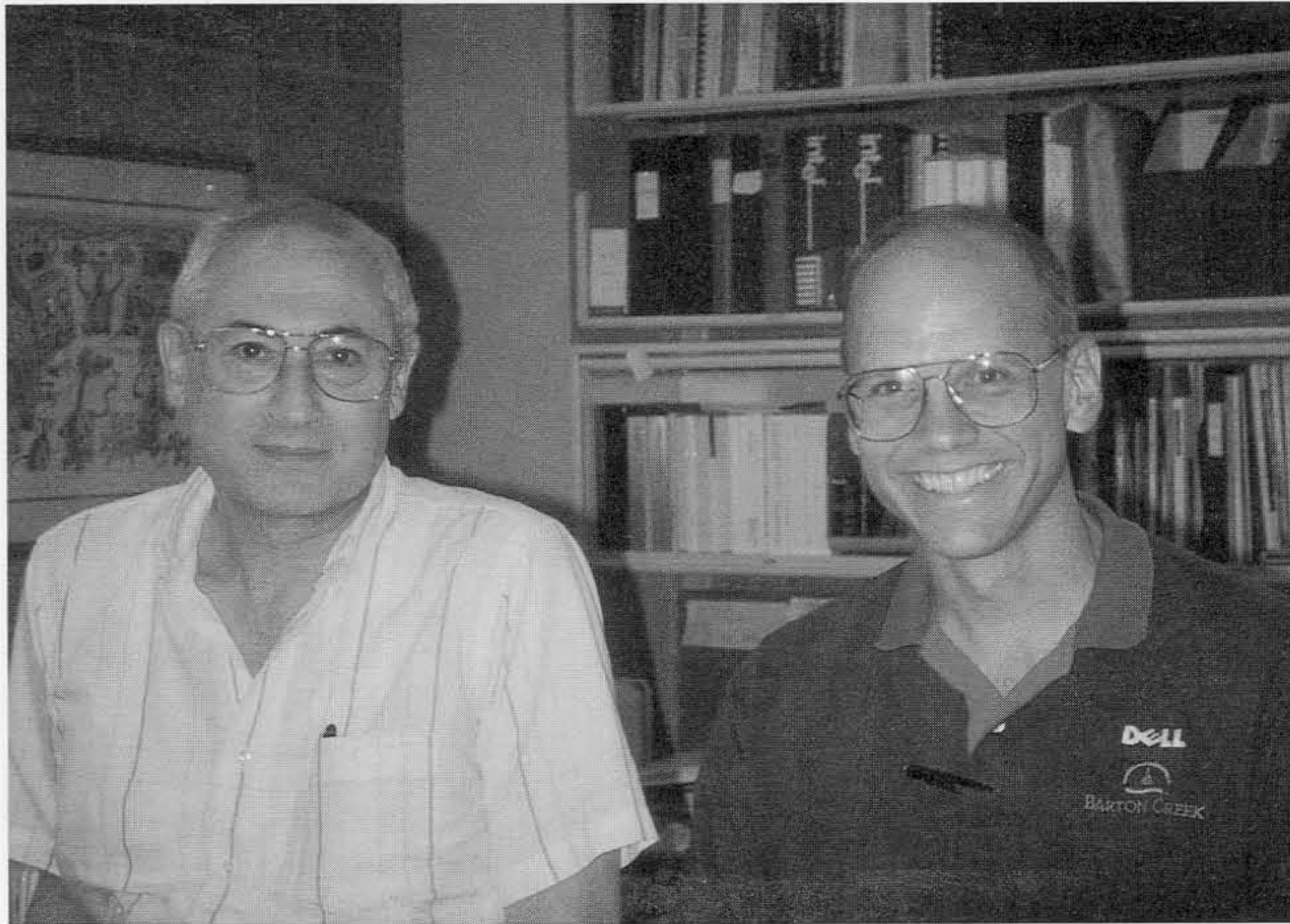
EDITOR: Judy Tolliver

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Going the other way: Doug McGregor in Japan



Doug MacGregor, right, visits with his former advisor Professor Mike Faiman during a recent visit to the department.

The computer science department has had a long history of hosting Japanese graduate students and visiting scholars. However, it is not often that one of our American students earns a degree in Japan. Doug MacGregor, MS'80, is one such person. MacGregor is now vice president for desktop personal computers at Dell Computer Corporation in Austin, Texas. The path he took is unusual. After receiving his BA in history at the University of Maryland, and his MS in computer science from Illinois in 1980, he went on for a PhD in information science from Kyoto University.

"Suffering from terminal immaturity, as many young people do," MacGregor considers himself lucky have been drafted into the service. Stationed in Japan, he enrolled as a student in history in the University of Maryland's Far East extension program, where he took a Japanese language course. He found that he

loved the language and developed a strong interest in Japanese culture. After graduating and finishing his military obligation, he found his career options limited to "selling shoes or teaching." With a young family to care for, he prudently decided to enter computer science. Because of its reputation and the fact that he was an Illinois native, MacGregor chose Illinois's MCS program. After passing the qualifying exam, he switched to the MS program. His first job after graduation in 1980 was at Motorola in Austin, Texas, where he did the design work for the 68010 and 68020 microprocessors. In 1985, in an effort to broaden his horizons, he decided to get a PhD in information science from Kyoto University.

Motorola was a valuable part of MacGregor's education. "For semiconductor design and microprocessor development," he says, "the best education is in industry. Indus-

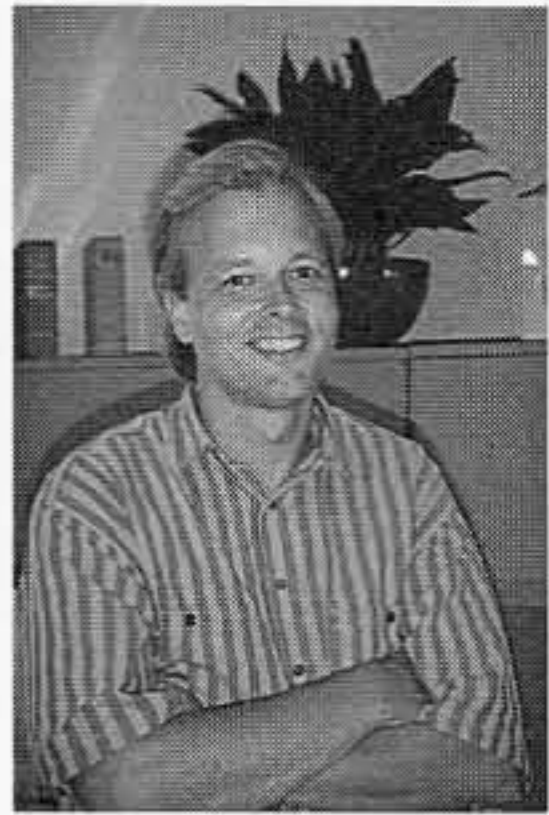
try is the real graduate school of microprocessors." However, he felt that blasting through graduate school in a year and a half (which is what it took him to get the MS), was not enough. The practical experience gained by working for industry could better prepare him for refining his technical skills in graduate school. Studying in Japan would do that while allowing him to further cultivate his interest in the Japanese language and culture.

Following his graduation from Kyoto, MacGregor worked for Matsushita for six months before starting his own company, Solbourne Computer Inc. He eventually moved the company from Japan to the U.S. where its revenues grew to \$70 million. Solbourne makes UNIX-based computers compatible with Sun Microsystems workstations. In 1992, MacGregor went to Data General Corp., where he headed the hardware development group for the company's Avion line of UNIX computers. In late 1993, he became VP for desktop personal computers at Dell Computer Corp.

"My Japanese experience was invaluable not simply in business negotiations with Japanese companies," says MacGregor. "So much of business is understanding what people mean, who you can trust, what their values are, and what types of things are important to them. Once you learn these things, you can bridge the issues that are critical to business. Living in Japan and knowing the language has helped me do this."

MacGregor has received more than 10 patents in microprocessor design and implementation. He has a 21-year old son and twin toddlers, a boy and girl. He lives in Austin, Texas.

Iris joins Lotus

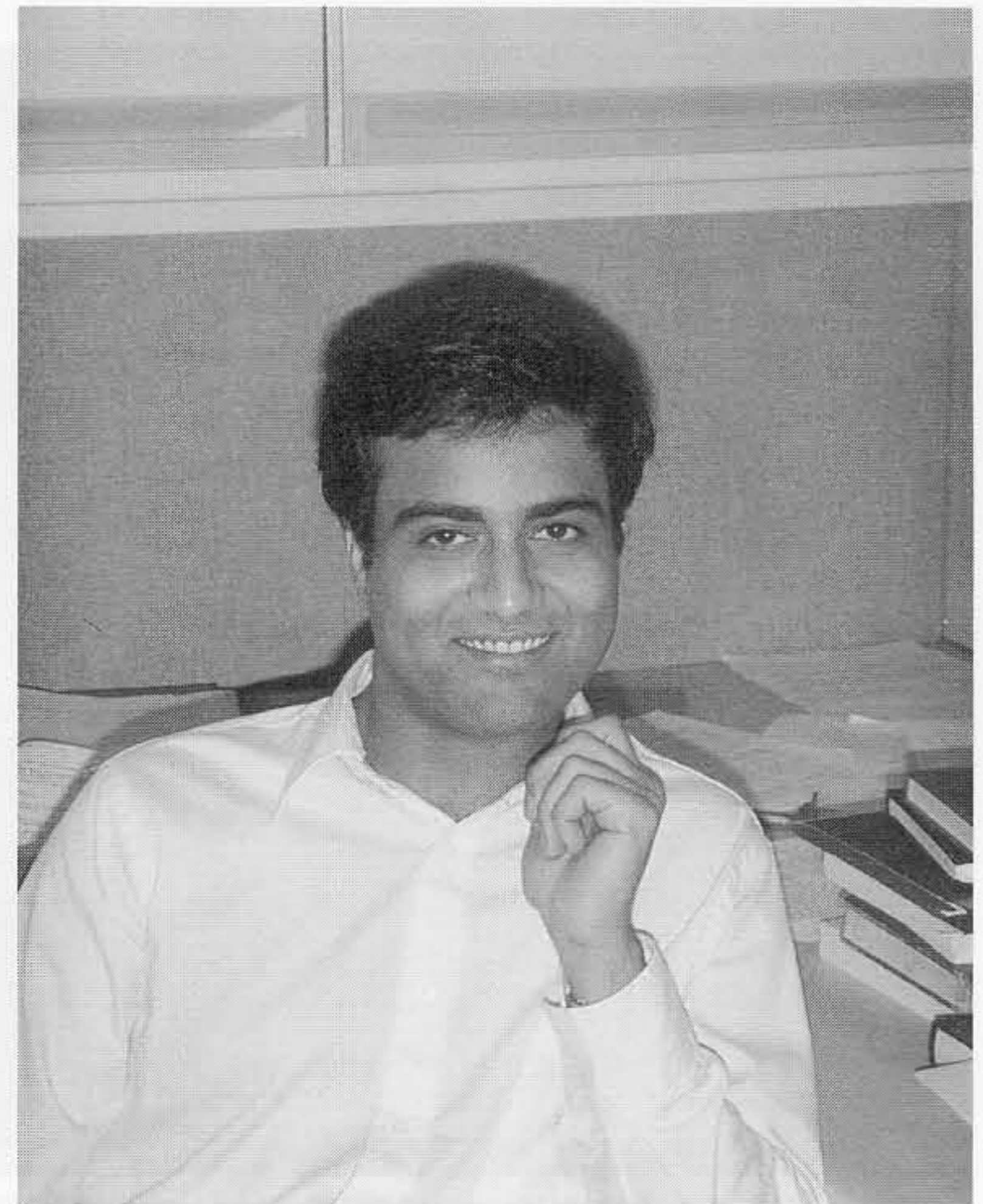


Ray Ozzie

Iris Associates, founded by alumni Ray Ozzie (BS'78), Len Kawell (BS'77), and Tim Halvorsen (BS'77), was sold to Lotus Development last spring for \$84 million. As a wholly-owned Lotus subsidiary, Iris will continue to operate from its Westford, Massachusetts, headquarters, and Ozzie will remain its president. Ozzie, Kawell, and Halvorsen collaborated to produce Notes, a networking program which has had three major releases since 1989. According to Lotus, Notes is used by about 900,000 people at more than 3,200 firms. Iris and Lotus have worked closely together in the past, and Lotus has been paying Iris royalties for Notes. Since Notes has spun off other products, "the dividing line between the two companies was becoming a little gray," according to Ozzie. Newsbytes reports that Notes, cc:Mail, and Lotus's communications consulting business together make up 25 percent of all Lotus's revenues.

Sharad Mehrotra joins the faculty

The department continues to strengthen its software sector by adding faculty member Sharad Mehrotra. Originally from Dehradun, India, at the foothills of the Himalayas, Mehrotra followed his love of mathematics and the practical advice of his parents and earned a BS in computer science at ITT-Kanpur. He then came to University of Texas at Austin for graduate studies in 1988. His PhD thesis was on transaction management of multi-databases. The last year of his graduate studies was spent working part-time for Matsushita Information Technology Laboratory in Princeton. After graduation, he worked at MIT Laboratories for a year on workflow management systems, multimedia queries, and text indexes and databases (specifically, retrieval of documents based on content). His research at Illinois will focus on transaction processing, interoperability between heterogeneous database systems and data mining. (Data mining uses a variety of statistical analysis and data



Sharad Mehrotra

visualization tools to ferret out useful information from mountains of data.) Mehrotra was attracted to academic life at Illinois first by the dynamic environment of the computer science department and second by the lively atmosphere of the Champaign-Urbana area.

DCS now offers course in Transaction Management

Transaction Management (CS 497) is a new course introduced this fall and taught by Professor Mehrotra. Students study concepts and techniques used in building transaction processing (TP) systems. The first part of the course consists of the theoretical basis of transaction management and current industrial implementations. The second part addresses current research issues,

including the impact of emerging non-traditional applications and technological advances in TP systems.

Transaction processing systems are large, distributed, heterogeneous systems that may consist of thousands of terminals, employ hundreds of computers, and provide service with zero downtime. Transaction processing technology deals with all

aspects of the TP systems, including programming language and library support for writing applications, application generators, terminal presentation services, database systems, networking, and operating systems software.

Torrellas wins NSF Young Investigator Award



Josep Torrellas

Professor Josep Torrellas has won the National Science Foundation Young Investigator Award (formerly known as the Presidential

Young Investigator Award). The award includes up to \$100,000 per year for five years.

Torrellas has been with the department for two years. Prior to that, he was at Stanford University, where he earned his PhD while working on the design of the Stanford DASH multiprocessor.

Torrellas's research focuses on designing hardware and software systems for scalable shared-memory multiprocessors. The main focus is on techniques to improve the performance of the memory hierarchies (cache, local memory, distributed memory) of these machines and involves architecture, operating system, and compiler issues. Torrellas will continue to investigate the design of the Illinois Aggressive COMA machine. This machine incorporates aggressive techniques to reduce the number of memory accesses and the amount of traffic in scalable machines.

Do you
really
want to be
PC?

See page 21.

Butler Lampson gives Gillies Lecture

Butler Lampson, senior corporate consulting engineer for Digital Equipment Corporation, presented the eighteenth Donald B. Gillies Lecture in two parts, on April 21 and 22. The first lecture, "Putting telecommunications on the technology curve," addressed the growing gap between the communication services engineers can build and the ones customers can buy. Lampson explored network architectures, market structures, and public policies. The second lecture, "Interconnecting computers: Architecture, technology, and economics," was on connections and the many ways multiplexing can be implemented. Lampson described some of these ways and considered how different levels of the recursive hierarchy of modern computer systems interact.

Lampson was one of the designers of the SDS 940 time-sharing system,

the Alto personal distributed computing system, the Xerox 9700 laser printer, two-phase commit protocols, the Autonet LAN, and several programming languages. He is a member of the National Academy of Engineering, and received the ACM's Software Systems Award in 1984 for his work on the Alto, and the Turing Award in 1992.

The Gillies Lectureship was established through memorial gifts by family and friends, with a major contribution by the Digital Equipment Corporation. It is named in honor of Professor Donald B. Gillies, who came to Illinois in 1956. He was among the first mathematicians to become involved in the computer field, helping to program the first Sputnik orbit and later discovering three new prime numbers in the course of checking out Illiac II. Gillies died in 1975.

Chien receives grant from Tandem

Tandem Computers donated \$50,000 to support Professor Andrew Chien's research in multiprocessor interconnects. This work supports the development of scalable, reliable transaction processing systems.

Chien is shown here accepting a check from Robert Horst, technical director at Tandem Computers Inc. They are joined by department head Duncan Lawrie and Dean William Schowalter in front of the Beckman Institute.



Duncan Lawrie, Andrew Chien, Robert Horst, and William Schowalter.

Rick Henderson

The end of an era: Carpenter retires



Gayanne Carpenter, administrative aide in the Department of Computer Science, is retiring in February, 1995, after 29 years of service in the department, and a total of 35 years of service at the university. Carpenter joined the department in October, 1966, and the department's MS and PhD programs were approved that December. As you can imagine, she has very fond memories of the many students she has known through the years. She has worked in almost every facet of department administration, and she has been an invaluable resource and friend to the department. She plans to remain in the area and do volunteer work at the U of I Rehabilitation Center and the local Office on Aging. Carpenter is an avid NASCAR stock car fan and plans on attending more NASCAR races. She has also been thinking about having her own lemon shake-up stand.

We are collecting notes and letters from *you* for Gayanne's farewell scrapbook. Please send your contribution to Judy Tolliver at the department.

Student Awards

The following students were honored at the department's awards reception on April 15, 1994.

*John R. Pasta Award
for Academic Achievement*
Jeffrey C. Barcalow

ICCP-James N. Snyder Award
Joseph J. Schmid

*James N. Snyder Award for Academic
Achievement:*
Gregory D. Fast
Arkady Epshteyn

Daniel L. Slotnick Scholarship
Chad T. Langley

*C. W. Gear Award
for Undergraduate Students*
Mark V. Kadzie
Tony Chun-Tung Ng

*C. W. Gear Outstanding Graduate
Student Award*
John B. Plevyak

*Department of Computer Science
Teaching Assistant Award*
Edwin C. Tellman

These awards are financed by gifts from alumni and friends. For more information or to contribute to any of these funds, please contact the department.

Andersen, continued from page 1

the best and brightest people. Andersen Consulting looks to the University of Illinois for this expertise. We are a leading employer of graduates from the College of Engineering and the College of Commerce, and our Chicago office recruits more graduates from the University of Illinois than any other college in the Midwest. Our recruits include new and experienced graduates. Here is what some CS alumni have to say about their jobs at Andersen Consulting.

Vikram B. Sule (BS'94) is pleased with his choice in Andersen Consulting. "You receive extensive training throughout your career and there is a formal career development program. You have a chance to express your goals and interests and get feedback on your professional development. And, you can get exposure to different industries and you have the chance to use cutting-edge technology to help clients achieve their business goals."

Newenka Du Mont (BS'83), CSAA board member and associate partner

at Andersen, says: "When I joined Andersen Consulting, I did not want to be pigeonholed in technology; I wanted to work with people. I built strong technology skills and used those to get into the business world and develop my business and managerial skills. I now focus on working with client executives."

Partner Bill Witnik (BS'80) was looking for "variety, challenge, and the ability to get things done and make a difference. I've found all these things and more—some that I never envisioned when I left school. One was the growth and sense of confidence I gained in the business and professional world. Another is the personal financial growth that has been well beyond what I envisioned. I'm very pleased with the decision I made."

Andersen Consulting is proud of its strong affiliation with the University of Illinois and the Department of Computer Science. To learn more about this organization, see our advertisement on the last page of this newsletter.

Donors

We wish to recognize and thank each of you who have generously supported the department. Your support enables us to strengthen existing programs and to add new programs and initiatives that enhance the quality of education we provide. This list of donors includes those alumni and friends who have directed their gifts specifically to the Department of Computer Science during the period from July 1, 1993 to June 30, 1994. If your name has been overlooked, please call us.

Some CS graduates choose to support other units of the University of Illinois, and their gifts are acknowledged through the publications of those units. If it is your intention to support the department, you should indicate Computer Science on your check as well as on the donor form.

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Be PC

Now's the time to join the Presidents Council

The UI Foundation has decided to raise the financial requisite for the Presidents Council (PC) from \$10,000 to \$15,000, and to add two new recognition levels.

Those of you whose total gifts to the university are near the \$10,000 level should seriously consider going up to the PC level before January 1, 1995, when the change will go into effect. Remember, company matching funds can be applied toward PC membership and payments can be made over a ten-year period. Deferred gift instruments can also be used.

In addition to the general membership described above, there are several more recognition levels, including two new ones. The existing ones are Consulars Circle at \$50,000 and Laureate Circle at \$1 million. To fill in the gaps, the Foundation has added the Centuria Circle at \$100,000 and the Pentad Circle at \$500,000.

The Presidents Council is the University's highest donor recognition organization. We hope you will consider becoming a part of it.

Questions? Call Judy Tolliver at the department, 217-333-1621.

MOVING?

Be sure to send name and address changes to:
UI Alumni Association Records
227 Illini Union
1401 W. Green St.
Urbana, IL 61801.
Or call 217-333-1471.

Classnotes

Orin E. Marvel (PhD'70) is now chair of C3I Systems at the Naval Postgraduate School in Monterey, CA. He is responsible for teaching systems engineering to engineering and program management students. Since leaving U of I, he spent 15 years with Honeywell, five years with Hughes Aircraft, and four years at the SHAPE Technical Centre.
opainc@nps.navy.mil

Jerry Fiddler (MS'77) wrote an article on patenting software which appeared in the July issue of Inc. Fiddler is chairman and co-founder of Wind River Systems in Alameda, CA. Wind River, whose first commercial product was VxWorks, provides operating systems and development tools for the real-time and embedded systems marketplace.

Michael W. Reene (BS'77) has joined the IBM Consulting Group in Atlanta as general manager for cable, media, and wireless communications. He formerly was a partner with Andersen Consulting.

Donald D. Burn (MCS'78) and his wife Nancy Burke stopped by the department this summer to visit with his former advisor, Professor Mickunas. Don is a consulting engineer for Sequoia Systems in Marlborough, MA. burn@sequoia.com

Hal Goldstein (MCS'81) is president of Thaddeus Computing Inc. in Fairfield, IA. He is the owner and publisher of The HP Palmtop Paper, an independent publication for users of HP palmtop computers. 75300.2443@compuserve.com

Barry Pangrle (BS'82, PhD'87) now works at Synopsys in Mountain View, CA.

Richard Cochran, Jr. (BS'83) is now in Saucelito, CA, after working as a programmer for Pratt & Whitney in West Palm Beach, FL, for three years and McDonnell Douglas in St. Louis for six years. He currently programs for Autodesk, a company that produces

computer-aided design software for architects and engineers. He lives on the edge of the Golden Gate National Recreational Area and does mountain biking and volunteer work with the National Park Service.

Pervaze Akhtar (MS'84) is project manager at Fore Systems Inc. in Warrendale, PA. Fore designs and manufactures high-speed networking equipment, specifically ATM switches. akhtar@fore.com

Karen Brems Kurreck (BS'84) won the women's division in the World Cycling Championships on August 25 in Catania, Italy. Kurreck is an engineer at Software Publishing Corp. in Mountain View, CA. Congratulations!

Donna R. Blythe (BS'86) was married last October to James L. Butler. She is a program analyst with the U.S. Department of Agriculture in Washington, DC, and is working on her MS at George Washington University. They live in Burke, Virginia.

Ron Brinkmann (BS'86) works as a computer graphics supervisor for Sony Pictures Imageworks in Hermosa Beach, CA. Imageworks provides special visual effects for major motion pictures. Recent films which he has worked on include Speed, Wolf, In the Line of Fire, and Last Action Hero.
brinkmann@spimageworks.com

Norman Ma (BS'86) is a knowledge engineer at Loral Librascope in Glendale, CA. His present project involves a contract with the Navy developing planning systems for ship defense using artificial intelligence technology (case-based reasoning). nkm@libra.loral.com

Arch D. Robison (MS'87, PhD'90) is happy to report that he is out of Houston and back in Champaign-Urbana working for KAI. robison@kai.com

Jude Shavelik (PhD'87) and his wife Zoann Branstine (MA Spanish'87) had a baby girl, Margaret Elizabeth, June 15. Jude has been promoted to associate professor at the University of Wisconsin at Madison.

Amy K. (Swanson) Kreiling (BS'89) works for the Department of Computer Science at the University of North Carolina in Chapel Hill. She had worked for six years as a systems administrator with NCSA at UIUC. Amy has been active in forming a professional organization for system and network administrators in North Carolina, as well as organizing a technical lecture series broadcast across the state on their CoNCert video network. She gave a paper last April at the Third Annual System Administration, Networking, and Security Conference in Washington, DC. kreiling@cs.unc.edu

Walter N. Kreiling (BS'89) works for SportsMEDIA Technology Corporation, a small company that does sports scoring and broadcast graphics exclusively for ESPN. Among SportsMEDIA's projects are scoring all NASCAR and CART (IndyCar) races for ESPN broadcasts; in-studio scoring for ESPN's NCAA football and basketball coverage; and ESPN's signature score updates appearing 28 and 58 minutes after each hour. Prior to moving to North Carolina, Walter spent five years working for Dr. Craig Bethke in the Department of Geology at UIUC.

Joel Jones (current grad student) worked this summer at Hewlett-Packard Laboratories in Palo Alto on a modulo scheduler for VLIW machines. As "undercover agent for the CSAA," he reports on the following California alums: **John Coolidge** (MS'92) is married and works at Apple Computer, **Johnny Zweig** (MS'91) is engaged and has a new job at Xircom after working at Apple Computer for the last two years, **Thomas Skibo** (MS'92) works for SGI, and **Peter Madany** (PhD'92) works for Sun Microsystems.

B. Smith



Will your company grow as fast as you do?

Almost every company's recruiting ad promises you rapid growth. But before making any decisions, ask them how fast they're growing. After all, you're going to have trouble moving up if your company isn't.

Over the last five years, while economic conditions stalled many organizations, Andersen Consulting averaged 20% growth per year. Compare that figure to any other firm you're considering. It could be the difference

between getting ahead. And banging your head.

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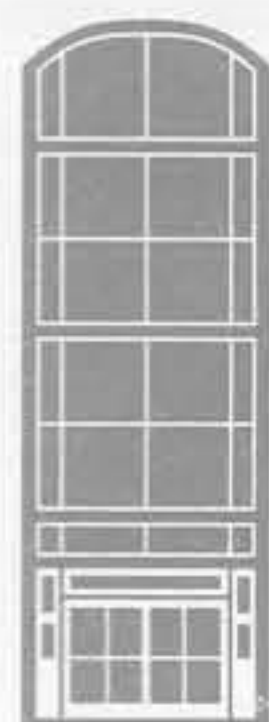
Send to Judy Tolliver, Department of Computer Science,
1304 West Springfield Avenue, Urbana, IL 61801.

Questions? Call 217-333-1621. *Cut this out and send it in today!*

Abbreviations

ACM	Association for Computing Machinery
CERN	European Laboratory for Particle Physics
CSAA	Computer Science Alumni Association
CSRD	Center for Supercomputing Research and Development
DCL	Digital Computer Lab
DCS	Dept. of Computer Science
FTP	File Transfer Protocol
HTML	HyperText Markup Language
HTTP	HyperText Transport Protocol
NCSA	National Center for Supercomputing Applications
PPP	Point to Point Protocol
SGI	Silicon Graphics Inc.
SLIP	Serial Line Internet Protocol
SMTP	Simple Mail Transfer Protocol
UIUC	University of Illinois at Urbana-Champaign
URL	Uniform Resource Locator
WAIS	Wide Area Information Server
WWW	World Wide Web

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