# Alumni Board takes off

Our first Computer Science Alumni Association board meeting was a smashing success. Some 20 people traveled from all over to attend on September 18 at DCL. After some Illini Union pecan rolls, department head Duncan Lawrie got everyone up to date by presenting the state of the department. Mike Faiman, director of graduate programs, and Bill Kubitz, associate head, discussed several of the ongoing programs in the department, including the undergraduate and graduate programs, an upcoming publicity video made by the university, the summer MS program, and the Illinois Summer Software Institute.

At the heart of the meeting was the establishment of the group itself. This involved electing board members and officers, and writing the bylaws. As you know, we have not had an active alumni program in the department. So, just how does one go about identifying possible board members? With the assistance of the college,

about one hundred alumni were identified as potential board members. These names were gleaned from UI Foundation data. We looked at past financial contributions, attendance at alumni events, whether or not one purchased an alumni directory—any indication of a desire to maintain university ties. A letter then went out to these people in the spring, followed by a phone call in the summer. Much to our surprise and delight, about 30 people indicated an interest in becoming board members. Because we
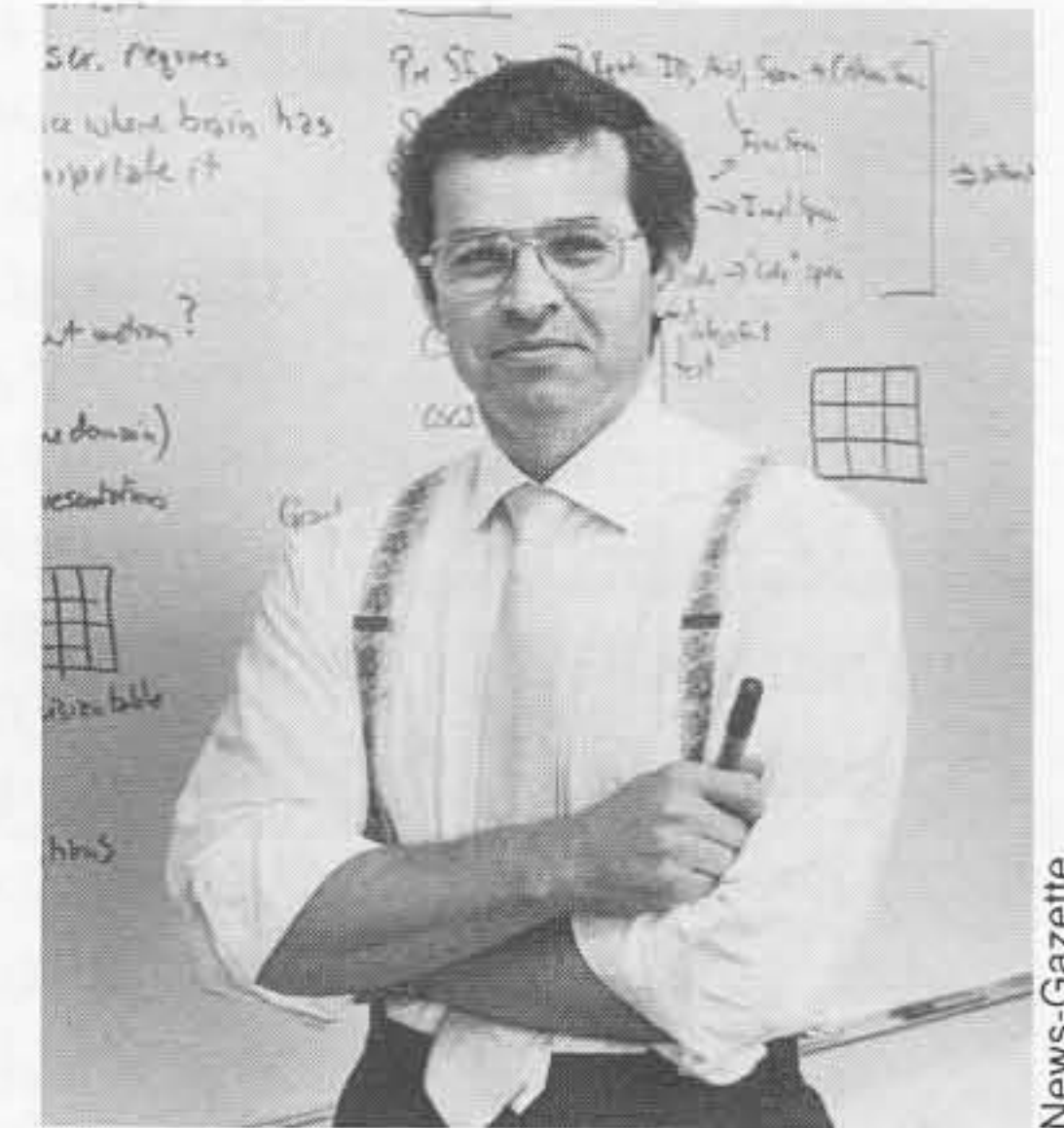
CS Alumni Association Board President Pete Alsberg

News-Gazette

Video conference in the comfort of your own office

by Neal Singer, Science Editor, UI News Bureau

On most Thursdays, at 12:30 pm, central time, 11 scientists in their offices around the United States use their computers not only to send handwritten messages but also to hear and see each other. Their images fill each screen like a pastiche of color snapshots in a photo album.

"This is the way people will communicate in a few years," says Professor Roy Campbell, who worked with electrical and computer engineering graduate student John Lockwood to develop the information-copying and -routing capabilities necessary to hold the series of experimental conferences.

Normally, participants in teleconferences must go to sites furnished with satellite-linked communications equipment. The new method, however, uses inexpensive video cameras, perched atop each participant's computer screen, to show their changing expressions and reactions to comments, as well as other people who come within

the camera's field of vision. Each person on camera determines the rate a which his or her image is transmitted. The resulting motion is similar to that of early silent movies.

Objects and blackboard diagrams can be moved into the foreground to explain concepts easier to grasp visually than verbally. A notepad function allows scientists to pass messages to each other without disturbing others.

Information from each video camera and computer travels over AT&T's XUNET, an experimental university network that has a broader bandwidth than the Internet, a fiber-optic network connecting computers at universities and industries around the world. XUNET can transmit the packets of information needed for pictures as well as sound at multiple locations.

Lockwood said he "configured the XUNET to support the multicast" by building on available Internet programs for conversation and image transmission. A multicast

From Plato to Iris:
The force behind Lotus Notes

Three former Plato programmers, Ray Ozzie '79, Len Kawell '77, and Tim Halvorsen '77 remained close friends after graduation. Together they went on to write Notes, Lotus's flagship product, from their home company, Iris Associates, which they founded in 1985.

Notes, an innovative networking program, is the hottest thing going at Lotus Development Corp. Sales of Notes is expected to reach $100 million by the end of this year and to continue at an explosive rate as more and more companies build their networks around Notes. Notes is the brainchild of Ray Ozzie (BS'79), founder and president of Iris Associates, and his collaborators Tim Halvorsen (BS'77) and Len Kawell (BS'77), both vice presidents. Iris and Ozzie recently drew major media attention in a Wall Street Journal article which opened with a quote from Microsoft chairman Bill Gates, describing Ozzie as "one of the top five programmers in the universe." Written at Iris, Notes is being marketed by Lotus. "We control the product, but Ray is the godfather and the source of inspiration of the whole thing," says Lotus chairman Jim Manzi. "It's the centerpiece of everything we're doing."

The origins of Notes lie with Ozzie, Halvorsen and Kawell and their days at Illinois as programmers on the Plato system at CERL (Computer-Based Education Research Lab). During the 1970s, computer resources were extremely limited. Students were subject to learning computer science by feeding punched cards to an IBM 360 in DCL. However, on the other side of Springfield Avenue, instead of sitting at keypunches doing numerical analysis, people were playing interactive, multi-player games and communicating with each other as they sat in front of the orange and black plasma screens of the Plato system.

Though Plato was a system of terminals connected by a mainframe (first a Cyber 6500 and later a Cyber 170-730), it had the look and feel of today's PC networks. "It was really compelling," says Ozzie, "so I was bound and determined to become a programmer on that system." He switched majors from electrical engineering to computer science, and in 1975, he landed a systems programming job on Plato. There he met Tim Halvorsen and Len Kawell.

Len Kawell was a Plato operator, and like Ozzie, he became enamored with Plato's communications capabilities. The Plato system had pnotes (personal notes), the equivalent of e-mail, and gnotes (group notes), perhaps the earliest form of electronic newsgroups. (Pnotes was written by Kawell's roommate Kim Mast. Gnotes was written by Dave Wooley.) Users could also "talk" to each other in real time. In the age of the Internet, this might seem mundane, but in the early 1970s, it was revolutionary.

Tim Halvorsen became a computer science major as soon as the degree was offered, and from his sophomore year until graduate school, in which he spent one year, he "hung out on Plato" non-stop. Employed at Plato full-time while going to school, also full-time, he was able to finance his education (and get very little sleep!). During his first year of work, he spent most of his time writing courseware, in Plato's language Tutor, for the prison systems under the Plato Corrections Project. This provided a way for prisoners to

learn without the security risk associated with conventional educational programs. After that, Halvorsen joined the systems group to work on systems software, multiprocessor support, and database functionality. "It was a crazy schedule," Halvorsen admits, "but a good time."

It was time to graduate and the options for the three were Silicon Valley or Route 128 near Boston. The three chose the east coast: Ozzie to Data General and Halvorsen and Kawell to Digital Equipment Corp.

At Data General, Ozzie worked on a project which now could be described as a client/server system. Halvorsen and Kawell worked on VAX. As the personal computer industry was just starting to emerge, Ozzie went to Software Arts, publisher of VisiCalc, the first electronic spreadsheet. "It was lots of fun. We ported VisiCalc to lots of PCs. It was during that time that I started, in my head, to tie local area networks to PCs. And I thought, This is it!"

A friend of Ozzie's from Data General days, Jonathan Sachs, had just written the spreadsheet 1-2-3 for Lotus as a competitor to VisiCalc. Sachs coaxed Ozzie to join him at Lotus, but Ozzie turned him down because he was working on "this other thing," which eventually became Notes. Mitch Kapor, Lotus's founder, made a deal with Ozzie. If Ozzie would work on spreadsheets at Lotus for a year, they would help him get started on the "other thing." Ozzie served as the lead programmer for Lotus's Symphony. The day Symphony was shipped, Kapor told Ozzie to polish off his business plans and to show him what he had. Ozzie spent six months negotiating with Lotus. Because 1-2-3 was doing well, Lotus decided to speculatively fund his company. Ozzie called it Iris, another flower, and launched the venture on December 6, 1984.

Meanwhile, Kawell had similar networking ideas while working at DEC. When he started, he began work on DEC's VAX project. "I started digging into it on my own and discovered that it didn't have any e-mail or group notes," says Kawell. So, independently, he built a mail program modeled after Plato's pnotes. After changing it to suit the DEC environment, it eventually became VMS Mail. A little after working on the first version of VMS Mail, again working in his "spare" time, Kawell decided to build his own version of Plato's gnotes. This ended out becoming DEC's Notes, which was the prototype for VAX Notes (still in use today). Kawell's "real" projects were VMS and DECNet. In 1982 Kawell joined Dave Cutler at DEC's new Seattle facility to build the first MicroVAX and a real-time operating system called VAX ELN.

Halvorsen also took a job with DEC and started working on the VAX/VMS project in 1976. He was to work on the VMS operating system for nine years, at first on various VMS utilities such as the system dump analyzer. He also wrote VAX Talk, based on Plato's term-talk. He was the project leader for DECNet for a number of years before becoming project leader for the first VMS workstation and working on its software architecture.

The three kept in touch ever since they left school. When Ozzie got the funding from Lotus for what was to become Notes, he formed Iris and a month later, on January 21, 1985, he was joined by Kawell and Halvorsen. Joining Iris was a tremendous risk at the time for both Kawell and Halvorsen, leaving DEC in the midst of VMS development. Steve Beckhardt also came over from DEC, and the four of them wrote the first version of Notes. Several more people came aboard, and the small group embarked on what was to be an 18-month project. Instead, it took almost five years before they were able to ship their product,

iris

ASSOCIATES

Notes, to their first customer in 1989. "It took off like a rocket," says Ozzie. He sold the rights to Lotus in 1988, and Notes now represents about 10% of Lotus's profits.

Iris grew quickly. When the first version of Notes was introduced, Iris had seven people on its payroll. When the second version came out, the company expanded to 15. By version 3, it had grown to 25, and now, at version 4, Iris has grown to 42. At Lotus, which now has over 4,000 employees, almost 500 work on Notes. This setup allows Iris to do what it does best and what its people enjoy the most: programming.

Ozzie is careful to preserve the small team aspect of his company which he feels provides an ideal environment and focus for his programmers. In the Wall Street Journal, John Wilke describes the ambiance at Iris in theatrical terms: "Its employees create code in a warren of comfortable offices arrayed around a plush room with couches and a bust of Elvis Presley. The room is dubbed the Crash Pad, after the living room in Iris's first home, where people went not to sleep, but to wait out frequent computer-network crashes that halted work. Around this hub, the soft clicking of keyboards drifts from darkened rooms where intense young software engineers are lost in their work. Cases of candy bars and cola fill a small kitchen." In fact, if you are put on hold while calling Iris on the phone, you will hear Elvis crooning in the background. Halvorsen explained that the running Elvis joke at Iris stemmed from a brainstorming session during which several Iris programmers were thinking up databases they could set up. They decided an "Elvis sightings" database would really be useful.

Sharing their common roots at Illinois, Ozzie, Halvorsen, and Kawell continue to enjoy working together, and they are working harder than ever. Companies like Oracle, Microsoft, and WordPerfect are all positioning themselves to introduce Notes-like products in the near future. "Now that we've broken through," says Ozzie, "the best we can do is to keep our eye on the ball."

What ever happened to Plato?

by H. George Friedman, Professor

A lot of U of I alumni remember the computerized teaching system Plato. If you ask around the campus today, however, many people won't recognize the name. Plato has become something of a victim of its own success.

Plato was developed, as you probably recall, right here at UIUC, in the Computer-Based Education Research Laboratory (CERL). Eventually, agreements were reached with Control Data Corp. (CDC) to develop and market Plato, and most rights to the name were sold to CDC at that time. The university retained the right to use the name Plato on the machine operated by UIUC.

Eventually, CDC pulled back from their Plato effort and sold the name and many of their rights to the system to The Roach Organization (TRO). Today, the name Plato identifies the TRO product in the CAI field. TRO's Plato is essentially the same system that was developed at CERL. Just to make things more complicated, CDC stayed in the CAI business, and therefore had to change the name of their CAI product. They chose to call it Cybis. So Cybis is essentially the same system as Plato.

Meanwhile, back at the university, CERL began some new development directions. A new version of Plato was started using satellite transmission from the central system to the remote terminals. This was christened NovaNET. About the same time, the old CDC Cyber central computers were retired in favor of CERL-designed computer boards called Zephyr processors. These accept the same machine instructions as the Cybers, in a multiprocessing environment, so the same system can run on the Zephyrs.

A new company, University Communications Inc. (UCI), was set up to market NovaNET service. The name Plato was phased out of UIUC operations to ensure that there was no encroachment on the trade mark rights of CDC and TRO. So CERL continued to operate, only now the service formerly called Plato was called NovaNET.

Stu Schuster Leads Sybase Charge
Pioneering the client-server concept

Sybase's domination of the lucrative database market can be directly attributed to Illinois graduate Stewart Schuster (PhD'73) and his marketing prowess. In 1987, the relatively unknown Sybase Corp. introduced a relational database management system (RDBMS) at a time when booming Oracle Corp. had a firm grip on the RDBMS market. INGRES, Informix, Unify, IBM, Cullinet, and others were all in the race. Through a well-orchestrated marketing strategy spearheaded by Schuster, Sybase quickly catapulted to the head of the pack. In 1992, sales grew to $265 million. Shearson Lehman Brothers predicts that Sybase will grow at least 40% by the end of 1993. Sybase now has over 2,000 employees and has become one of the top names in databases and client-server technology.

Just what has Stu Schuster been up to since leaving Illinois? After majoring in applied math and computer science at Washington University, Schuster came to Illinois's MBA program and landed a programming job for the Management Information Systems department, which developed applications for the running of the business side of the university.* The most important program which Schuster wrote for them had to do with the allocation of scholarship money from a wide variety of funding sources. A number of ad hoc, heuristic algorithms were employed to maximize the money allotted to the most needy.

Having never worked in the business world, Schuster became a bit bored with the business curriculum and began working on an MS in applied statistics, which he received in 1969 from the math department. It was during this period that Schuster took some elective courses in the computer science department (logic design, and programming linguistics) and met CS people attached to the Illiac IV project in what was then the Center for Advanced Computation. It just so happened that the Illiac people were looking for a statistician to work in Professor Dan Slotnick's group. So after completing the MS, Schuster entered the PhD program in computer science, working with Slotnick and Pete Alsberg (PhD'71). As it turned out, they really didn't need a statistical system for the Illiac IV right away. What they did need was a compiler, so they put Schuster to work on the compiler project and never did get to the statistics.

The center eventually started to get grants in areas that had to do with the application of computers to social problems. One such grant was to develop a database of some six counties around Chicago containing geographically-based information for land use planning. This really sparked Schuster's interest, and he began to see this as a potential thesis topic. It became the NARIS Project (Natural Resource Information System), and Schuster was one of its senior programmers after he left Illiac IV. Still working with Slotnick and Alsberg, he completed his thesis on algorithms for locating optimal sites in geographic information systems and received his PhD in 1973.

In 1986 Stu Schuster, PhD'73, was hired by Sybase to be vice president of marketing, just before the introduction of its first product. Eight years later, Schuster remains in his position and Sybase has become a top name in database technology.

From Illinois, Schuster landed a job as an assistant professor at the University of Toronto in the computer science department and the graduate business school. In CS, he taught and conducted research in database systems, query languages, compilers, and operating systems. In the business school, he taught applied mathematics and the use of management information systems. In 1977, he was working on parallel database machine which stirred up some commercial interest ("You don't get out of Illinois unless you think parallel!"). This resulted in an invitation from Intel in California to do consulting work and a leave of absence from Toronto. The frenzied pace of business in California was infectious, and Schuster found he had become fired up about applied research, especially in software and databases. The only problem was that at the time Intel had little interest in these areas. A friend lured Schuster to Tandem where Schuster headed up their database development team. He also got his foot into engineering, technical support, and sales. He had left the academic world for good.

Several years later, some associates from academia recruited Schuster to join a software company that they started called Relational Technology (now INGRES Corp.). In 1983, Schuster was the senior product manager for their database product. From there, he moved up the ranks to become director of marketing and vice president of business development until 1986, when he left for Sybase to become its vice president of marketing.

Schuster joined Sybase just before the introduction of their first product. Sybase employed 30 people, just 3 in marketing, and it had the kind of environment that suited Schuster well. "I believed they were riding the wave of the future. They had decided to focus on delivering a system that was very high performance, and one that was founded on a client/server architecture," he said in an article which appeared last summer in Marketing Computers.

The term "client/server" is credited to Forrester Research. Sybase referred to its own architecture as "requester/server" but liked the Forrester term better and so adopted it. The client/server architecture served as the foundation for Sybase's

technology and was one of the main concepts they tried to sell to customers. Therefore a large part of Schuster's marketing strategy involved educating people about client/server architecture. Another part was to focus solely on Oracle, Sybase's largest competitor, rather than on everyone. Schuster's marketing strategies paid off; Fortune magazine reported that Sybase is growing three times faster than Oracle, and Schuster now leads a marketing team of 120.

The pace of business life hasn't let up for Schuster as Sybase continues to push the envelope of database technology. Over the last several years, they have been moving toward building product system software to build practical large-scale distributed systems. One recent advance is Replication Server Technology, which allows for reliable dissemination and distribution of data over local area and wide area networks and which provides resiliency in environments prone to failures, attempting to keep the data as synchronized as possible. Another major area of development at Sybase is the multi-media application development system that works in a client/server database environment (e.g., interactive television with business data processing). A third area is new types of user development paradigms in which business analysts can directly program applications without having to be programmers. This is known as applications from modeling, in which business models are both graphical and rule-based specifications of applications. Most of this revolves around the use of object-oriented programming technology. Another area is distributed systems management, making it easier to manage large numbers of software applications and databases in client/server environments. "Lots of new things!" says Schuster, obviously still excited about his world.

*MIS was a group within the university's ADP office (Administrative Data Processing). ADP is now AISS (Administrative Information Systems and Services). ADP was formed to look at the application of management methods/science to improve the efficiency and effectiveness of large-scale university processes such as inventory control. Their activities were more related to what private businesses do, and their techniques at the time were novel to the university's business affairs.

Illinois Software Summer School opens new doors

Want to learn something new? Come to the Illinois Software Summer School (ISSS) in July! In its fifth year, this annual program at UIUC responds to the need for continuing education in software and related areas. Its objective is to provide professionals in industry, commerce, and academia with an educational opportunity to acquire or enhance their knowledge of software technology and its tools, recent advances, and emerging trends. The school is co-sponsored by the Department of Computer Science and the Office of Continuing Engineering Education.

The offerings of the ISSS are based on a survey of the needs of industry. Last year's offerings included:

- Courses in Mathematica
- Programming in C and C++
- Networking
- Objective-oriented analysis
- How to use the Internet
- Software reuse
- Software project management
- Graphics
- Artificial neural networks
- Database design

Some of these courses will be repeated next summer, and a few new courses will be added. The courses are designed to complement each other. Distinguished lecturers well-known for their academic and industrial experience are the presenters. Each course includes lectures, laboratory sessions, and discussion periods. And of course, participants will have the opportunity to enjoy the culture of the UIUC community in the relaxed atmosphere of the summer. Courses are two to four days long.

Software professionals from all disciplines of software development will find these courses beneficial in strengthening their skills and knowledge. We invite you to take advantage of this unique opportunity by attending one or more of the ISSS courses. For more information, please contact co-director Professor Mehdi Harandi, 217–333–4865, harandia@cs.uiuc.edu, or Lynnea Johnson at the Office of Continuing Engineering Education, 217–333–3836, lynnea@ux1.cso.uiuc.edu.

ACM gets workstation

SIGs moving and shaking

The Association for Computing Machinery at UIUC has just received $25,000 worth of IBM equipment, including an IBM RS/6000 340H workstation. Several ACM projects will utilize the new machine, including the SigSoft morpher, a 3-D database, a volume renderer, a ray tracer, and a radiosity renderer.

The special interest groups (SIGs) are very active this year. **SigArt** is working on a spoken command recognition project, a game theory project, and a simple phrase parser. **SigSoft** is working on three projects: The morpher, a graphics application that is being developed in C++ on SGIs and an IBM RS6000. It will be able to take two pictures and morph them to create a movie. Arena is a networked car battle game, written in C for the Macintosh. The Oscope is a simulator of an oscilloscope that is written in C on the PC. **SigGraph** is starting a networked Matrix/Metaverse representational game. **SigVR** is continuing to work on its own VR system. They have begun the first redesign of the Head-Mounted Display, and construction of the VGA-to-NTSC converters so that the HMD can be hooked up to a PC in the lab. **SigMicro** is starting on the Lego building block ALU. It is also constructing a computer-controlled telescope with the collaboration of the UIUC Astronomical Society and **SigArch**. SigArch has more projects underway: The scrolling sign project, a 64 by 8 array of LEDs controlled by a small embedded microcontroller. Hooked up to the Internet, people all over the world will be able to send messages to the sign. SigArch is also working on producing a second batch of PowerGlove Serial Interfaces (PGSIs) which allow the use of a Nintendo PowerGlove with a PC. The Apropos Computing Engineer (ACE) project will use Field Programmable Gate Arrays (FPGAs) to allow a host computer to "program" the electronic pathway and logic functions of the device. They are also designing a 64-bit general purpose I/O computer interface for the Macintosh. **SigOps** is working on an object-oriented, message-based microkernel.

For more information on ACM activities, please call 217–333–5828 or send mail to acm@cs.uiuc.edu. ACM chair is Mike Duff, duff@cs.uiuc.edu.

Mosaic: Global hypermedia system born at Illinois

Mosaic is an Internet-based system for hypermedia information discovery and retrieval and asynchornous collaboration written by computer science senior Marc Andreessen and research programmer Eric Bina (BS'86, MS'88). Mosaic integrates cleanly into existing Internet protocols, formats, data sources, and environments, and provides powerful new capabilities for using and sharing information across the Internet. Built at the National Center for Supercomputing Applications (NCSA) on campus, the system was based heavily on existing Internet information systems, particularly Tim Berners-Lee's World Wide Web project at CERN in Switzerland.

Mosaic is available for Unix/X Windows, Macintosh, and Microsoft Windows. Andreessen and Bina wrote the original version for the X client. Computer science graduate student Aleks Totic ported it to the Mac, and graduate student Jon Mittelhauser (BS'92) and research programmer Chris Wilson (BS'92) ported it to Microsoft Windows on the PC.

"Mosaic was designed to encompass most of the information sources on the Internet by way of a single coherent user interface," explains Mittelhauser. It has full TCP/IP-based communication support including Gopher, FTP, NNTP, HTTP, and gatewayed access to WAIS (Wide Area Information Servers) and other data sources. The result is complete transparency of data location and retrieval process, thereby permitting the user "to focus all of his or her attention on the real task at hand—interacting with the information itself."
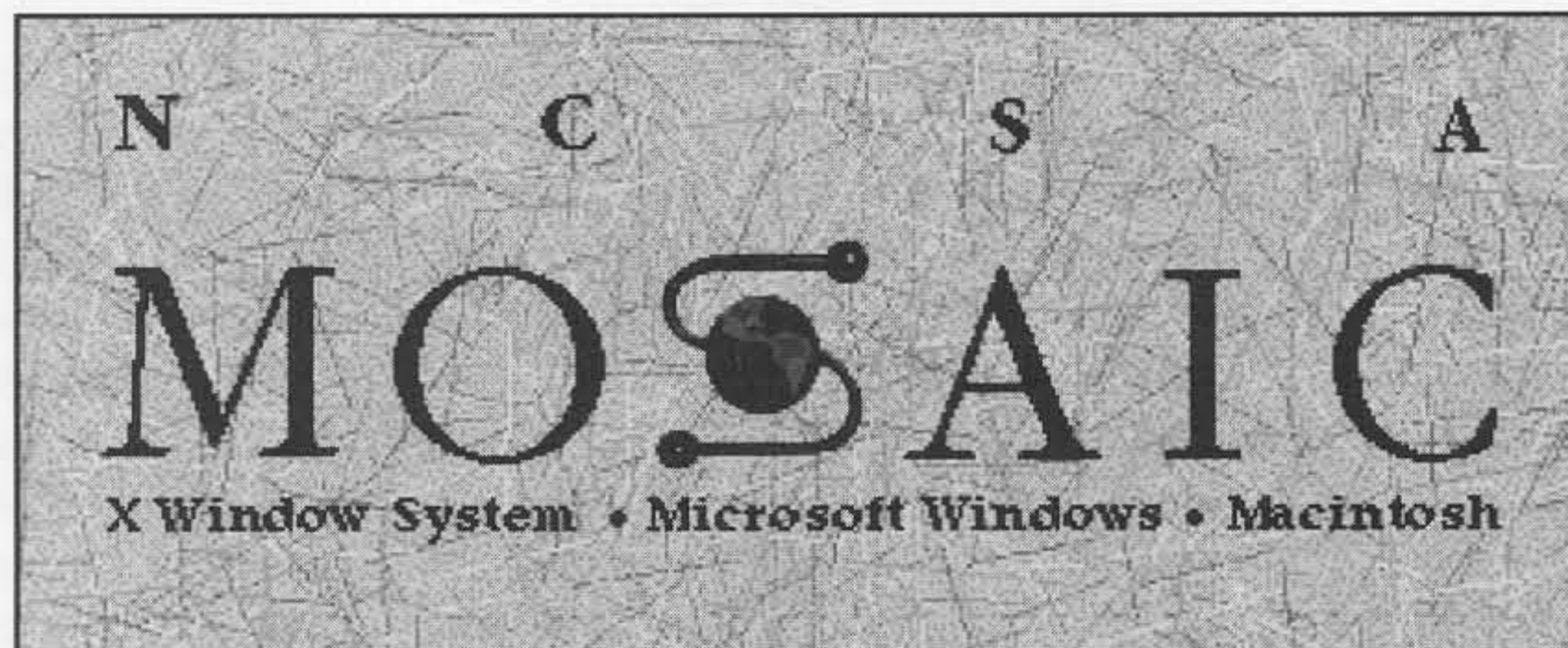
Mosaic graphically displays plain text, rich (formatted) text, and hypertext, as well as inlined access to graphs, images, audio clips, video sequences, and scientific data in multimedia and hypermedia documents. It also has an advanced graphical user interface featuring on-the-fly font and style selection, cut-and-paste support for formatted text, and extensive customization and user support options. It has facilities for information space navigation and history-tracking, capabilities for in-

document and Internet-based searching (including access to WAIS databases) and for asynchronous collaboration, including text and voice annotations for documents located anywhere on the Internet.

Mosaic uses the Uniform Resource Locator (URL) mechanism to name information resources. URLs can point to documents residing on FTP or HTTP servers, new articles on NNTP servers, queries to WAIS databases, documents within WAIS databases, documents or search engines residing on Gopher serves, specific sub-parts of documents residing on any server, and almost anything available on the Internet

through some network-based access mechanism.

It is hoped that the asynchronous collaboration will allow people to work cooperatively in groups on common sets of information without regard to physical proximity. "While the focus of the Mosaic project has shifted to the underlying technologies of distributed hypermedia and network-based information retrieval, asynchronous collaboration remains a driving force in its development," according to Andreessen and Bina.

The Mosaic group is now working on improved text formatting and user interface support, authentication and access control functionality, graphical history and information space representation and control, "intelligent agent"-based information filtering and retrieval, support for interacting with "knowledge daemons," and for collaborative filtering of information spaces.

Mosaic is becoming enormously popular. It was first released in Februrary 1993, and it now boasts over 100,000 users worldwide. The beta versions for the Macintosh and for Microsoft Windows were released in October and resulted in nearly 20,000 combined downloads for that month from NCSA's FTP server alone.

Mosaic is freely available to anyone for noncommercial use and can be gotten from NCSA's anonymous FTP server, ftp.ncsa.uiuc.edu in the /Mosaic directory. For more information, contact the Mosaic group at mosaic@ncsa.uiuc.edu.

Seniors tackle real world problems

Based on the success of similar programs in other departments, the computer science department is offering a pilot senior project course. "Instead of having the students work on things cooked up by professors," explains faculty advisor Ralph Johnson, "we have sought out real problems generated by industry, that people want to have solved." Students in small groups work for the entire year on a specific project. An actual company becomes a customer so that students can use them to find out about the problem, can work together with the company on a regular basis, submit progress reports, and complete other real-world tasks.

Most undergraduates have been encouraged to work by themselves in their classes. Having problems given to them, most have never really had to figure out just what the problem is. Senior projects give good experience in working in groups, defining problems and communicating, by making reports or giving presentations.

"I wound up working on a very high-end software package for Caterpillar," says senior Mike Duff. "Using Advanced Visualization Systems software on Silicon Graphics hardware, we are visualizing finite-element analysis data. It may sound dry, but it's some of the most colorful, wildest animation you've ever seen, and I would never have been a part of it if I had not signed up to do a senior project."

This year there are eleven students currently working on three projects. They have been analyzing the problems to be solved and are in the process of designing solutions.

Project 1. Caterpillar. Design engineers at Cat spend a lot of time and effort on stress and damage analysis of tractors. They use the results of various simulations to feed back into the design. Because this iterative process uses lots of different software packages, results are difficult to compare. To integrate this process, students are building graphics tools to take the output of various simulations and compare them so that engineers can interpret the results easily. It is a very graphics intensive project, and students are evaluating AVS as a tool to solve this problem.

Project 2. Motorola. The Motorola facility in Urbana has a simulator for a new type of computer that they're building, and would like a better user interface. Because the simulator was developed at another Motorola site, students have to figure out how the thing works. In addition to adding a graphical user interface, the students plan to improve the statistics that the simulator takes. They are to follow Motorola software development guidelines so that people at Motorola can maintain the software when they are done.

Project 3. Computing Research Laboratory (CRL). The computer science department's CRL needs to improve their problem reporting system. Currently when someone finds something wrong with software or hardware in the department, they send e-mail to someone. From an administrative point of view, it's very difficult to tell what's going on. Because there is no tracking system, sometimes several people will be working on the same problem at once. CRL needs a tool to track problems, store them in a database, find out how it is being dealt with, report on how it was corrected, note which part of the system is continually having problems and should be fixed, *etc.* Students are now exploring the use of a system called GNATS to address these problems.

Hopefully, the success of this program will result in increased enrollment and tie in to summer jobs. One possibility is for students to spend the summer before their senior year with one of the next year's sponsors, learning about the company and the context of the problem. While not all students would want to do this, having one or two students acquainted with the sponsor company would would contribute greatly to the success of the project. If anyone is interested in participating in this program as a project sponsor or summer employer, please contact Professor Ralph Johnson, 217–244–0093, johnson@cs.uiuc.edu.

Database systems course uses Mosaic

Database Systems (CS 311), a course taught by Professor Marianne Winslett, provides students with a background in database concepts as well as practical information on database systems design. Traditionally, the course has focused on management of structured information. However, since most of the information available on the Internet is in the form of unstructured documents, a new approach was introduced, using Mosaic (page 8).

During the class, live demonstrations of available Internet facilities are followed by problem sets. One such problem set was a scavenger hunt through the Internet for a wide-ranging variety of tidbits. From the practical: Where will SIGMOD be held in 1994? To the far-out: From The Whole Internet Catalog, what is the asking price of Scheherazade's Secret, a llama owned by a company called Rolls Adventure?

Champaign-Urbana gets wired

This year, the Champaign County Chamber of Commerce (CCCC) formed a group called the Infostructure Committee to address the establishment of a high-speed information network in Champaign county. This network is called CCNet, and it is being championed by professors Larry Smarr and Roy Campbell and more than 40 community leaders working through the CCCC. Scott Lathrop, community outreach coordinator, is the project leader at NCSA. At a CCCC dinner this summer, Smarr said, "The idea would be to make Champaign County and Champaign-Urbana one of the most advanced communities in the country in terms of digital libraries and access to information." He also said that Champaign-Urbana is a natural place for such a system since the university "has historically been the lead university in the country in supercomputing since World War II." When the area is all hooked up, it will join only a handful of other communities with high-speed network access.

For the pilot project, the Infostructure Committee is looking for multiple sites to participate. Connection options include fiber-optic cable, cable TV, existing phone lines, and wireless communication for the more remote areas of the county. Initial products under consideration are InChannel by Hybrid Networks and Channelworks by Digital Equipment Corp. Both utilize the community's cable system. The Hybrid Networks system broadcasts high-speed (2.5 to 5 megabits/second) data to the end user, and the return path would be slower (e.g., modem). Most of the current cable system does not support two-way communication. The DEC product would offer Ethernet-type speeds in both directions. One or more X-terminals or workstations could be on the Internet supported by much higher speeds than are currently available. The committee is continuing to look at other vendors and solutions as well. An initial prototype system is expected to be operational sometime in 1994. For more information, contact Professor Roy Campbell, 217–333–0215, campbell@cs.uiuc.edu.

U of I links with Wisconsin

The new fiber-optic link between the U of I and the University of Wisconsin at Madison is currently the fastest wide-area network in the country. According to Erik Grimmelmann, spokesman for American Telephone & Telegraph Co., which installed the line as part of its Experimental University Network (XUNET), the switching and transmission technology used in this network did not even exist a few years ago. The Urbana-to-Madison link operates at 622 megabits per second and is one branch of XUNET, which connects four research universities and three laboratories. Most of the other connections operate at about 45 megabits per second, but all will eventually graduate to higher rates, with the Urbana-to-Madison link as the lead. Professor Roy Campbell cites other AT&T-UI joint programs on campus as one of the reasons UIUC was chosen as a test site by AT&T. Researchers plan to use this link for simulations involving the weather, astronomy, and virtual reality. About 30 researchers on both campuses now use this network.

Class of '88 gives DCS high marks

How do you feel about us? Based on a recent survey, our graduates seem to feel good about the experience and education they got at the university. For more than two decades, the University Office for Planning and Budgeting has conducted comprehensive surveys of its graduates. The survey covers a number of post-graduate experiences, including employment, further education, and general perceptions toward the university. The most recent survey involves students who graduated in 1988, five years later. Here are some of the results:

Employment: 90.6% of the respondents who majored in CS were employed full-time; 95.3% of those graduates were employed in a related field to their degree. 92.5% were satisfied with their jobs. The median annual salary was $49,000.

Additional education: 19.0% of the graduates who returned questionnaires had completed additional degrees. 17.1% were currently pursuing another degree.

Attitudes and perceptions: 95.7% indicated a strongly or moderately positive attitude toward the U of I in general. The percent indicating a positive attitude toward the CS major was 94.9%.

Our graduates fared better than the college and campus averages in a number of areas, including job satisfaction and salary.

A Best Buy!

The University of Illinois at Urbana-Champaign ranked sixth out of the top 10 considered the best college buys in America by Money magazine for 1993, moving up five notches from last year.

Department offers support to women graduate students

The status of women in the computer science department and in the field is a growing concern within the department. And the College of Engineering has recently been examining the same thing at the college level. The average percentage of female graduate students in computer science is slightly above the college average. Of 2,221 graduate students currently enrolled in engineering, 283, or 13%, are women. In computer science, of the 426 graduate students, 63, or 15%, are women.

Several years ago, the department began to sponsor social get-togethers for women graduate students twice a semester to provide them with opportunities to meet each other. These gatherings, regularly attended by about half of the female computer science graduate students, women faculty, and other invited members of the department, have been quite popular.

In fall 1993, a mentoring/buddy program for new female graduate students was begun by current graduate students Vicki Jones and Ulrike Axen. Professor Marianne Winslett is faculty advisor. This program was modeled after one of the detailed recommendations contained in the College of Engineering's Dean's Ad Hoc Committee on the Status of Women Graduate Students and Faculty's report issued in spring 1993. It is hoped that this program will expand to include all new graduate students.

It was discovered, surprisingly, that many female undergraduates in computer science were getting poor advice not only from peers but from families with regard to graduate school. It is not known how widespread this is, but many women were actually discouraged from attending graduate school in computer science. "In many possible computer science careers, a master's degree is the most valuable degree to hold," explains Winslett. "Many employers value the added credential and may use it as a required or *de facto* qualification to be hired for their interesting jobs. Coworkers and bosses often take comments and suggestions from master's degree holders more seriously than from employees who stopped with a BA or BS. Thus a master's degree usually brings the greatest mobility and flexibility in one's career. For the research-minded, of course, a PhD is required by most potential employers." To address the perceived problem of women actually being discouraged to attend graduate school, the department is sponsoring a panel for women undergraduates in computer science and in electrical and computer engineering. The panel will consist of women associated with UIUC (alumnae and women currently at the university) and will discuss graduate school in computer science and life beyond. It is modeled after a similar program at Argonne National Lab.

Alumnae: How you can help

We are currently working to establish more programs for women in computer science. Would you consider participating in the following?

- Allow a female CS undergraduate to shadow you at work for a day.

- Serve as a mentor to a local female computer science undergraduate.

- Visit an Illinois high school (e.g., your alma mater) to talk about what it is like to be a computer professional. (We have a script and video available to help.)

- Serve occasionally on a panel on campus for our graduate or undergraduate students.

If any of these interest you, or if you have more ideas, please contact Judy Tolliver at the department.

Stop the Insanity!

Surely none of you has forgotten the joys of registration at the Armory. By spring 1995, this process will at last be computerized using UI Direct, which will run on the campus's UIUCnet electronic network.

A new College of Engineering Alumni Directory is in the works, due out in December 1994. Stay tuned!

Dear CS Alumni:

I'm happy to serve you as president of the Computer Science Alumni Board. To be frank, being elected president had not been at the top of my to-do list for September 18. However, I must admit that my concerns soon abated as person after person talked with me after the meeting and offered their help on specific issues. My impression is that we've got a lot going for us as we turn up the gain on CSAA's intensity.

First, there were a lot of people at the meeting; they were unquestionably enthusiastic; and there were many who were not able to attend but cared enough to write or call to say they were interested in serving on the board.

Second, we have a crack core of committee chairmen who make the kind of noises that lead me to believe they will make a difference and make that difference now.

Third, we found that of the 4,000 or so CS alumni, about 40% are already members of the UI Alumni Association. The UIAA thinks 40% is pretty good, and we got there without even working at it. Perhaps we can crank that up to 50% or 60% with a little work.

One of the interesting concepts that came out of our meeting was the idea of setting up regional alumni groups in the Bay area, Chicago, Boston, Austin, and other locations where we have a large concentration of alumni. John Fox, membership committee chair, would be interested in your feedback on that concept.

Part of keeping the value of a University of Illinois degree high is making sure that our department is putting out the kind of graduate our society needs. Marc Martinez, advisory committee chair, is coordinating alumni input to the department. Interestingly enough, a sea of hands went up during the board

meeting when we asked for members of this committee—much more than any other committee. Obviously it is important to a lot of us. It is also one area where we can provide extremely valuable real-world insight to a university program. Best of all, Duncan Lawrie and his band of merry people really want to know what we need out here in industry. So your input is likely to be heard and seriously contribute to determining the skill set University of Illinois graduates bring to our society.

I look forward to meeting and hearing from lots of you. Please stay in touch so that we can provide our membership and future membership with opportunities to both give and receive over the course of our lives.

—*Pete Alsberg*
President, CSAA

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Do you know about ICAP?

ICAP is the Illinois Computer Affiliates Program and its purpose is to establish and enhance contacts between Member Organizations and those engaged in computing research at the University of Illinois. Member Organizations represent business, industry, and government. ICAP brings together scientists from Member Organizations who are engaged in research, advanced, development, and product design with university faculty and graduate students who are engaged in basic research. Such cooperation leads to a vital synergism where not only do new results from basic research lead to new products and technologies, but the development of new technologies leads to fresh possiblities and new applications for computer systems. For more information on this exciting program, contact Professor Bill Kubitz, 217–333–6249, kubitz@cs.uiuc.edu.

Board, from page 1

decided to limit the board to 20 members, we drew names from a box to determine who the first board members would be. (And in the next newsletter, you shall get a proper introduction to these people!)

Pete Alsberg was elected president, Dave Grothe is first vice president, Marc Martinez is second vice president, and Judy Tolliver is secretary-treasurer. Six committees were formed: Advisory, Bylaws, Membership, Communications, Fundraising, and Nominating. Committees are not limited to board members, so if you are interested in serving on any of these, please contact the appropriate chair.

The board plans to meet at least twice yearly. Future meetings are scheduled for January and March.

Video, from page 1

goes to selected sites, unlike a broadcast, which goes everywhere.

He also developed tools to test the network, and to change the routing configuration from a single site so that a location experiencing difficulties can be dropped from a conference without removing participants elsewhere.

Scientists using the system now take part in discussions on subjects such as the prevention of image fade-outs and methods to create priorities for circuits so that audiovisual conferences take precedence over data transmissions. The system can handle 113 such conferences simultaneously.

The 7-year-old experimental line connects the UIUC; Bell Labs at Murray Hill; several sites at UC-Berkeley; Sandia National Labs in Livermore, CA; Rutgers U; and UWisconsin-Madison. Work on the system is supported by AT&T and a grant from the National Science Foundation.

Plato, from page 4

The latest chapter in this saga is the agreement between the university and UCI for UCI to take over all NovaNET operations, with a three-year phase-in period. At this writing (November 1993), UCI is in control of NovaNET operations. CERL itself will be closed in the summer of 1994. Many CERL employees have already transferred either to UCI or to other positions, both inside and outside the University.

So Plato lives on, with TRO. It has a twin, Cybis, which lives on at CDC. And it has a new sibling, NovaNET, which lives on with UCI.

R. I. P. CERL.

CS DEPARTMENT PERSONNEL

Shigenori Matsushita (MSEE'63) concluded his 34-year career in Toshiba Corp.'s computer business and moved to Toshiba Information Systems Corp. in Kawasaki, Japan, a software/service subsidiary, where he will serve a key role in the company's management. As one reason for the move, Matsushita cited his belief that a specialized company could have more interesting business opportunities than a diversified, vertically integrated company in the open environment of the computer industry. Matsushita was a Fulbright scholar at DCL. matsushita@tg-mail.toshibal.co.jp

Kenji Naemura (1967-1969 DCS, Illiac IV Project) moved in 1992 from Nippon Telegraph and Telephone Corp., Tokyo, to Keio University at Shonan Fujisawa Campus, west of Yokohama, where he is Professor of the Faculty of Environmental Information. naemura@sfc.keio.ac.jp

Bill Chapin (BS'73) worked for Martin Marietta in Orlando, Florida, for 18 years prior to coming to Texas to work for BMC Software in September 1991. He works in the R&D department doing product support, quality assurance, program development, and research. He earned his CDP from ICCP in May 1982 and was selected to "Who's Who of Central Floriday" for 1990-91. He has two children, Brian 13 and Cheryl Beth 11. bchapin@sysubmc.bmc.com

Gordon C. Fossum (BS'78) has been working for IBM for over five years. Before that, he was an officer in the Air Force. He got his MS at Berkeley and is now finishing his PhD at U. Texas. As an IBM staff programmer, he's working in computer graphics with the RISC/6000 and PowerPC projects. He loves living in Austin. fossum@cs.utexas.edu

Steve Ruzich (BS'78) is a sofware engineer at Digital Equipment Corp. in Maynard, Massachusetts, developing realtime operating systems. He and his wife Cindy, whom he met in Champaign when he was an apartment manager and she was working for a real estate management firm, have a 13-year-old daughter. Steve plays trombone in the Digital Big Band and in the Marlboro Symphony. ruzich@helix.dec.com

Ginnie Lo (PhD'83) is a tenured professor of computer science at U. Oregon in Eugene and stays busy with her two soccer-playing kids, ages 11 and 13. Husband Paul, who founded Paul's Bicycle Shop in Urbana, now has two bike shops in Eugene. lo@skinner.cs.uoregon.edu

Anne Jane Gray (MS'84) lives in Pittsburgh and manages a group of software developers working on AFS at Transarc. Her husband **Dave Carr** (MS'89) also works at Transarc, as does **Pervaze Akhtar** (MS'84). Ann and Dave have two boys, ages 4 and 7. gray@transarc.com

Stan Krolikoski (PhD'85) is a VHDL Fellow at COMPASS Design Automation of San Jose, California, and site manager of COMPASS's Rochester, Minnesota, development facility. Previously, he was VP of Engineering at CAD Language Systems Inc., which was acquired by COMPASS. He's been chair of the IEEE VHDL Analysis and Standardization Group for six years and is also director and head of the technical coordinating committee of Analog VHDL International (AVI), a new industry consortium formed to help develop an analog version of VHDL. stank@clsi.com

Len Seligman (MCS'86) is Group Leader of the Intelligent Database Technology Group in the AI Techni-

cal Center at the MITRE Corp. in McLean, Virginia. He is the PI of an internally funded R&D effort on integration of heterogeneous databases and has recently published several papers on this subject. Len and his wife Melinda have two boys, ages 6 and 3. len@starbase.mitre.org

Bill Hoff (PhD'87) is working at Martin Marietta Corp. as a staff engineer, currently on ARPA's autonomous vehicle project, the Surrogate Semi-autonomous Vehicle (SSV). hoff@ssv.den.mmc.com

Charles E. Tracey (BS'88) has a long address: Captain, United States Air Force, The Joint Staff; Command, Control, Communications and Computer Systems Directorate, Intelligence C4 and Information Systems Security Division; The Pentagon, Washington, DC. He's been working in computer security and his current position puts him in the middle of policy formulation for the Department of Defense. Tracey@DOCKMASTER.NCSC.MIL

Jeremy Schneider (BS'88) has been in the technical education department of Silicon Graphics since August 1992, when MIPS and Silicon Graphics "merged." He loves his job teaching graphics programming and says, "I can't believe they're paying me to do this." jeremys@sgi.com

Kevin Leman (BS'88) married **Liz Schleiter** (BS'87), and they now live in Chicago. Kevin is an EDP auditor for Abbot Labs and will soon roll off into a regular MIS position. Before Abbot, he was a senior consultant with Arthur Andersen. kevin.leman@mwbbs.com

Mark T. Grippando (MCS'88) and his wife Amy had a baby son, Anthony, on January 3, 1993. At Electronic Data Systems, in Chicago,

Mark develops systems using CASE technology in the U.S. and Japan.and is working on the strategic plan for EDS to propel us into the next century. mtg@mar_unix01.ceco.com

Chris Love (BS'90, MS'92) has been living in Dallas for the last year and a half and is doing GUI development for a software tool being developed by Texas Instruments. love@ddd.itg.ti.com

David Luginbuhl (PhD'90) has been promoted in the Air Force to the rank of major.

Sherri Arnold (BS'91) was promoted by Computer Sciences Corporation, to staff consultant. She has been programmer analyst at CSC for a contract management system for a major pharmaceutical manufacturer.

Albert Kim (BS'91) just returned from two years as a researcher at the Centre for Cognitive Science, University of Edinburgh, UK, and has

Host Bill Kubitz and his classmates toast the good old days at DCL. All were graduate students of the Professor Ted Poppelbaum in the late 1960s. The group was on campus in September during the UIAA '67'68'69 reunion, held the weekend of September 18. From left to right, Bill Kubitz, Peter Oberbeck, Debbie Rollenhagen, John Esch, Judy Esch, Sally Oberbeck, and Dave Rollenhagen.

started the PhD program at the University of Pennsylvania in computational linguistics. alkim@gradient.cis.upenn.edu

Hold your (electronic) horses...

We're afraid we spoke too soon about an electronic newsletter and alumni e-mail hub. Several things still need setting up and matters now lie in the capable hands of the CSAA Communications Committee and departmental programmers. Thanks to those who responded initially. A lot of your responses are in this newsletter. So, please keep the classnotes e-mail coming. We'll let everyone know when the system is up and running!

Young Alumni:

In addition to the UI Alumni Association's double refund offer (see back page), they are offering additional incentive for recent graduates to join the alumni association. As you know, all new graduates receive one year's membership free upon receiving their degrees. Under the new program, those persons can now qualify for an additional year at a reduced rate of $15 per person (rather than the general annual membership dues of $25). This offer is only in effect during your second year out of school, and no refunds on these memberships will go to constituent groups like CSAA.

A special thanks

to Charles Tracey (BS'88) for his generous donation of the Proceedings from the 16th National Computer Security Conference to the Department of Computer Science Library.

ProNet here

Those of you who haven't received the ProNet mailing from the UI Alumni Association, take note. ProNet is a new computerized job placement service available for UI alumni. Developed at Stanford University and expanded to a small consortium of schools including Illinois, ProNet connects participating alumni with potential employers who subscribe to ProNet services. The service is not for entry-level positions. For information, contact Mark Jordan, program director, at the UIAA, 217-384-8350.

C·D·R
Constituent *Double* *Refunds!*
Join the Computer Science Alumni Association!

Now's a great time to join! For the remainder of this fiscal year (through June 30), constituent alumni associations, like CSAA, will receive double refunds on all UIAA memberships which they bring in. As you may know, we currently receive a refund of about 20% of dues paid to the UIAA. Through this plan, CSAA can double its membership income for the remainder of the fiscal year (and help pay for this newsletter!). Please use this form to ensure that we receive this benefit.

Make checks payable to:
University of Illinois Alumni Association
Return to:
University of Illinois Alumni Association
227 Illini Union,
1401 West Green Street,
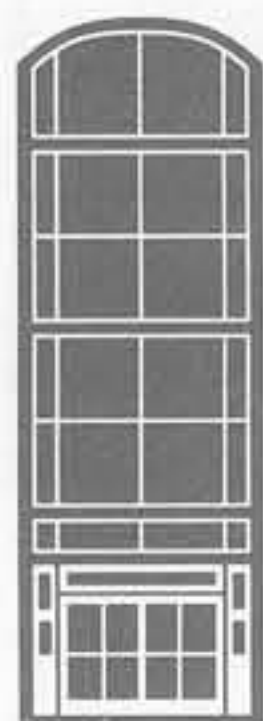Urbana, IL 61801

Single
❏ Annual - $25
❏ Life - $350*

Family (husband/wife)
❏ Annual - $30
❏ Life - $400*

❏ Please send information.

Recent Grad
(within two years of graduation)
❏ Single Life - $300*
❏ Family Life - $350*

* Installment plans available.

Name_____ SS#_____
Address_____
City_____ State_____ Zip_____
Phone_____ E-mail address_____
College_____
Major_____ Year of degree_____
(additional degrees)_____
Spouse's name (where appropriate, maiden name)_____
Spouse's college_____ SS#_____
Spouse's major_____ Year of degree_____

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Printed on recycled paper.