

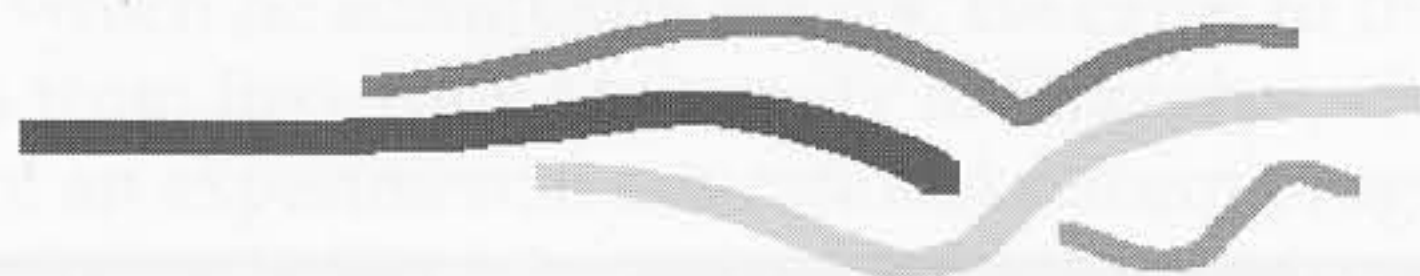
Rocket science meets computer science (or VR—Virtual Rocketry?)

by Professor Mike Heath

The U.S. Department of Energy recently announced that the University of Illinois at Urbana-Champaign has been awarded one of five national Centers of Excellence devoted to the advancement of high-performance computer simulation capabilities, as part of DOE's Accelerated Strategic Computing Initiative/Academic Strategic Alliances Program. Other winning universities are Caltech, Stanford, University of Chicago, and University of Utah. The awards are based on a national competition that began last November and drew proposals from 48 universities.

The focus of UIUC's new Center for Simulation of Advanced Rockets (CSAR) is on integrated computa-

Center for Simulation of Advanced Rockets



University of Illinois at Urbana-Champaign

tional simulation of complex, multicomponent systems that require an interdisciplinary approach, with specific emphasis on whole-system simulation of solid-propellant rockets. Research and development activities at CSAR involve a broad range of disciplines including combustion, fluid dynamics, solid mechanics, materials science, and many areas of computer science. The funding level for CSAR is \$20 million over a 5-year period, with the potential for up to \$50 million over 10 years.

Ten UIUC academic departments and about 30 faculty members are involved in CSAR. With 8 faculty participants, the Department of Computer Science forms the largest single component, accounting for approximately

continued on next page

Bay Area Illini Bash!

Mark your calendars for Friday, January 16, 1998, when the Department of Computer Science and the Department of Electrical and Computer Engineering will host a reception for its alumni. The reception will be co-hosted by Sun Microsystems.

Details are:

Friday, January 16, 1998

5:00 to 8:00 pm

Crossroads Room, Building 11
Sun Microsystems, Menlo Park

Bay area alums will receive postcard invitations, with directions. Ideas on how to make this the best Bay Area reception ever are most welcome. CS alums, email Judy Tolliver, tolliver@cs.uiuc.edu. ECE alums, email Emma Marshall, marshall@ece.uiuc.edu.



ACM president Paul Swanson proudly staffs the ACM booth on Quad Day, August 29, 1997. Our ACM student chapter now boasts more than 300 members. More ACM news inside.

University of Illinois
Computer Science
Alumni News

Editor: Judy Tolliver

Computer Science Alumni News is published twice a year. Deadlines for submissions: March 1 for the spring issue, October 1 for the winter issue. Your input is needed and welcomed!

All ideas expressed in the *CS Alumni News* are those of the authors or editor and do not necessarily reflect the official position of the alumni or the Department of Computer Science.

Correspondence concerning the *CS Alumni News* should be sent c/o the editor, Department of Computer Science, 1304 West Springfield Avenue, Urbana, IL 61801, or to alumni@cs.uiuc.edu.

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We hope you'll consider joining. The CS Alumni Mentor Program, now in its third year, is stronger than ever. We have 185 active alumni-student pairs and 90 alumni waiting for students.

Some alumni who signed up in 1995 were surprised to have a student assigned to them this fall. That's because we still have more alumni than students sign up.

Because our alums change jobs and email addresses frequently, we had to make a number of phone calls to find "lost" mentors (especially to anyone who was att.com!). We'll probably send another direct mail piece to alumni next summer to update our mentor pool. Some mentors are working with their second and third students, especially those who are employed in areas that are currently popular among students (Internet and graphics, for example). Also, as students graduate, their mentors are "recycled." We have more than 70 graduates of the program.

Occasionally we assign more than one mentor to students who have requested more than one. Exploring several areas and comparing working at a large company with a small one are a couple reasons cited for additional mentors.

We also saw a boom in the number of freshmen signing up, perhaps as a result of the program's promotion during CS 100, the orientation class required of all freshmen in CS. ACM has also publicized the program.

Our mentor program has been so successful that the ECE and MatSE departments have adopted similar programs.

If you would like to become part of this exciting program, please send email to alumni@cs.uiuc.edu. We'll tell what it's all about and how to sign up. Not only is participating interesting, informative, and rewarding—for mentors and protégés—but it can also be fun! ■

Rocket science, continued from front page

40 percent of the overall research effort. CSAR is headquartered in the Digital Computer Laboratory, and I serve as center director.

CSAR research in computer science includes work in programming environments, compiler optimization, performance analysis, parallel input/output, data management, scientific visualization, numerical algorithms, computational geometry, and mesh generation and refinement. Much of this research is devoted to overcoming the chal-

lenges of integrating diverse physical, mathematical, geometric, numeric, and software components into a coherent system that will work effectively on highly parallel computer systems. This project will provide UIUC scientists with access to some of the world's largest and fastest computers located at the DOE national laboratories, including machines with up to 9,000 processors in a single system. ■

<http://www.cse.uiuc.edu>

Department welcomes two new faculty members



Professor Shang-Hua Teng

SHANG-HUA TENG left the University of Minnesota and joined the CS faculty as associate professor this fall. His research interests are in scientific computing, parallel computation, computational geometry, algorithms, VLSI and circuit simulation, combinatorial optimization and probabilistic analysis, distributed computing, and cryptography. He is an Alfred P. Sloan Fellow and a recipient of the NSF Faculty Early Career Development Award.

Teng's path to Illinois involves many cross-country car trips, which he admittedly enjoys. He came to the United States from Jiao-Tong University in Shanghai, China. As part of an experimental educational reform program, involving only 20 of the university's top students, Teng earned bachelor's degrees in both CS and EE. In a normal program of study, about 80 percent of the classes taken are required; the option of taking classes outside one's major were extremely limited. Teng was also fortunate to be one of 20 honors students chosen by Jiao-Tong's president to attend graduate school abroad on a World Bank-sponsored program. He enrolled at USC, attracted by the dynamic and international character of Los Angeles. A year after being a student in parallel computer architecture, Teng switched to work with Professor Gary Miller in theoretical computer science and earned his MS in 1988. When Miller left to join the faculty at Carnegie Mellon University, Teng followed. At CMU, Teng's research again shifted from the parallel algorithms he had been working on to more geometrically oriented problems. "We were always joking," Teng said, "about how Los Angeles was a very planar place, and

how in Pittsburgh, every place is three-dimensional, and that is why I chose to study 3D problems." Teng received his PhD in 1991.

He then took a one-year postdoctoral position at Xerox PARC, where he employed geometric techniques to solve numerical and scientific computing problems involving numerical linear algebra and mesh generation. Working there had a tremendous impact on the direction of his research. He got his first patent (for a compiler technology) during this very productive year at Xerox. From there, Teng went to MIT for two years and the University of Minnesota for three years. Between semesters, he either worked in industry (Xerox PARC, Intel, IBM-Almaden) or a national lab (NASA-Ames). Professor Michael Heath persuaded Teng to explore coming to Illinois, and Teng decided to come based on Illinois' strong CS programs, especially in scientific computing and computational geometry, and the overall strength of its College of Engineering.

One of Teng's major research thrusts, mesh generation for computer simulations, lies within the auspices of the ASCI program (see front page). Teng gave the example of a continuous domain, like an aircraft. To do a computer simulation of this aircraft, it must first be discretized because computers can only handle discretized events. But an aircraft itself is continuous, so it must be decomposed into parts and the simulation must be performed on these parts.

Teng also spends a lot of time looking at geometric structures and graph theoretical structures and how to apply these structures to problems that arise in information organization, data compression, and scientific computing. "A variety of simulations or information organization can be expressed in terms of the correlation between objects," he said. "So mathematically, you can apply graph theory. There are basic units with relationships among them, so you can model them abstractly as a graph."

This semester, Teng is teaching security and cryptography. He is also writing his first book, which is about the multilevel method for optimizations that apply across the domain, from scientific computing to basic graph theory and from computer graphics to how to organize information.

In his free time, Teng reads novels and enjoys the outdoors—hiking in the mountains, along lakes, and in other scenic areas which are, unfortunately, pretty far from Champaign-Urbana. It's nice, then, that Teng likes to take those long car trips! ■



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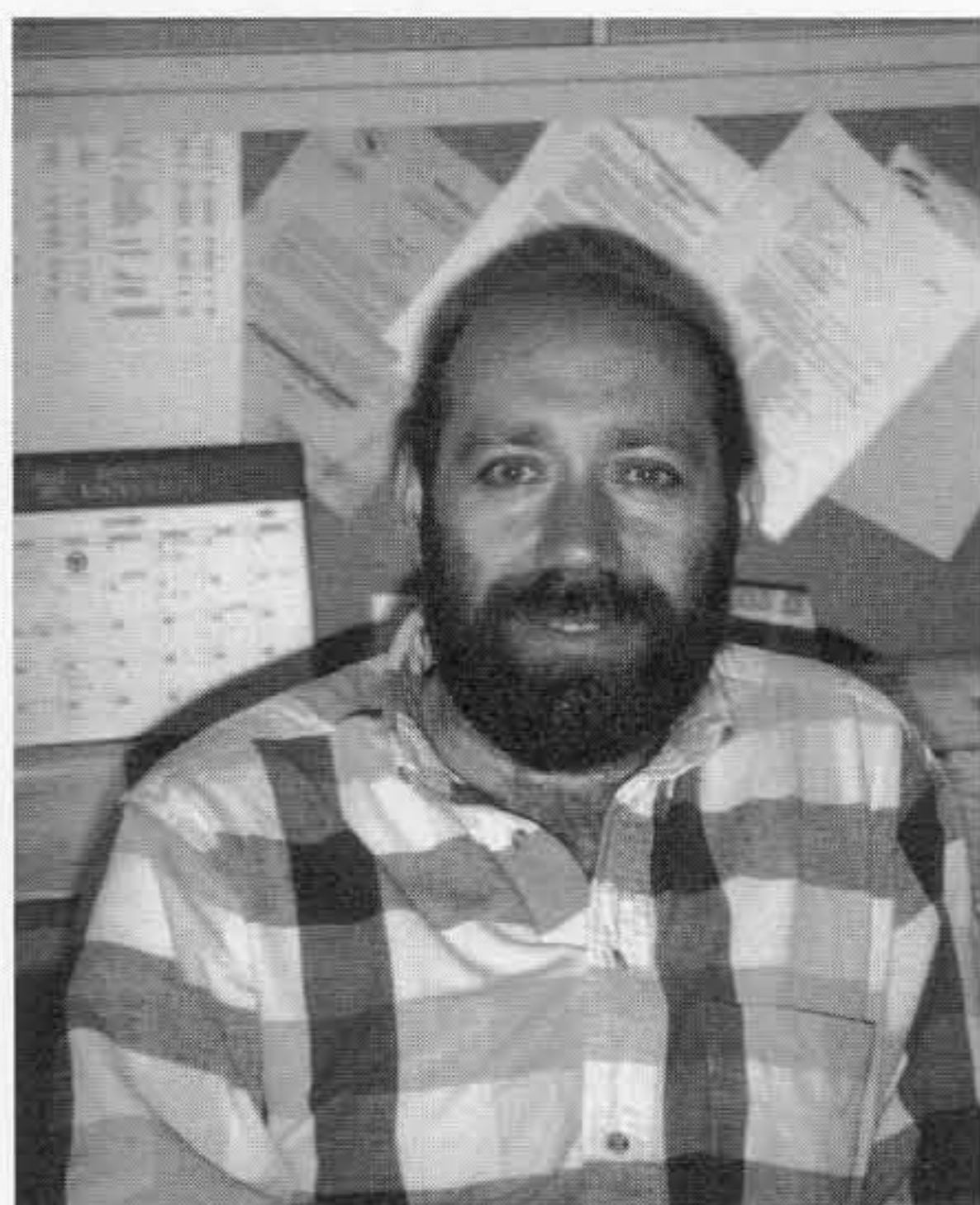
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Professor Dan Roth

DAN ROTH joined the department as assistant professor this fall. Working in the area of artificial intelligence, Roth's research focuses on understanding the role of learning in supporting reasoning and other high-level cognitive tasks. His application area is in learning and maintaining large

knowledge bases that support knowledge discovery and information extraction from text and images. Roth's work overlaps areas in AI and theoretical computer science, and his interests also include psychological and biological issues related to cognition.

Roth came to Illinois after earning a BA in mathematics from Technion, Israel. He worked for an Israeli Ministry of Defense laboratory for nine years, dealing with algorithmic and theoretical issues. Developing real-time, intelligent systems led Roth to pursue a CS degree at Harvard University and to devote his research efforts toward learning and artificial intelligence. He attended Harvard mainly so he could work with Professor Leslie Valiant, and he completed his PhD there in 1995. He then returned to Israel as a postdoc at the Weizmann Institute of Science before coming to Illinois.

Roth is investigating computational theories of learning and reasoning, with natural language processing on the application side. In particular, he is interested in learning and inference in the natural language domain. "The goal is to make progress on language and text understanding," he said. One important area that he is exploring is how to achieve more intelligent information retrieval and extraction than is found in today's search engines. Roth believes that to bring searching to a higher level, conceptual barriers must be broken. Rather than looking for something in the literal sense, one would like, instead, to look for something based on the concept behind it. In language, we learn from many sources, acquiring statistics and using knowledge sources like dictionaries, synonyms, and thesauruses. Furthermore, people have constructed taxonomies of the language that take on a hierarchical structure. For instance, a chair is a piece of furniture, a piece of furniture is something else, and so forth. Roth believes that a key concept to machine

learning is knowing how to use the many knowledge sources together to figure something out.

One problem Roth is tackling is context-sensitive spelling correction. Using a simple example of the sentence, "I'd like the chocolate cake for desert," he illustrated one shortcoming of current spell checkers. "You have to know something about the world and something about the language in order to detect that 'desert' is not the right word to use. As humans, we detect this instantaneously. We apply a lot of knowledge to make simple decisions of this sort, and we do this all the time. Almost every word in English has more than a single meaning, yet we have no problem reading."

Roth embraces both of the main philosophies behind AI research: one that wants to solve the problem but doesn't care how, and one that wants to understand how the brain works and use that understanding to solve the problem. "We can try to solve the problem and get pretty good performance on some local problems, which may be of great interest. Maybe I'd be able to put up a system that corrects spelling or does some other natural language related inferences, and that would be great. In order to scale it up, though, such that it can do many things together the way we do will require that we know something about the brain. We'll have to discover or work with processes that are more similar to what the brain does."

To illustrate just how far behind humans machines are in conceptual understanding and learning, Roth pointed to a categorization project he is leading to teach a machine how to recognize dogs. He pointed out that although a machine can be very good at recognizing a specific dog, it cannot recognize a generic dog. "A Great Dane and a tiny Pinscher are both dogs, but a machine wouldn't know that because visually, they are different creatures. How do we know that these are dogs? We interact across modalities, and machines do not. One of the purposes of my research is to learn how to introduce many other information sources into the learning process. While you're learning from text, you can also interact with something else—your teacher, your mother, the dictionary—that will give you some clues. Eventually, maybe we'll get to a situation in which some visual mechanisms would also give us clues. And if you know how to put these clues together, you have a chance of making progress toward interacting across modalities."

After work, Roth spends as much time as he can with his daughter and son, ages 8 and 3. His wife, Michal, is also a computer scientist. He credits her with introducing him to natural language processing, an area in which she had been working when she was with Mitsubishi Electric Research Lab in Cambridge, Mass. ■

MATHmaniaCS:

Discrete mathematics and CS explorations for kids of all ages

by Professor Lenny Pitt

This summer, 38 teachers of grades 1–12 participated in a professional development workshop which I organized at DCL. The MATHmaniaCS workshop demonstrated fun, hands-on activities that introduce central topics in discrete mathematics and foundations of computer science.

The idea for the workshop originated from work done by Michael Fellows and Nancy Casey, who developed the mega-math materials (<http://www.c3.lanl.gov/mega-math>). Mike is a colleague at the University of Victoria who has a long history of involvement in developing CS educational activities and materials for kids grades K–12. After using some of his materials in my kids' school and at the Don Moyers Boys & Girls Club after-school program, I became excited with the possibility of introducing young children to fun topics such as propositional logic, binary numbers, graph theory, and finite state machines.

Realizing that only a small impact could be made by just one person wandering from school to school, I applied for, and received, an Eisenhower Teacher Professional Development grant administered by the Illinois Board of Higher Education. With help from CS graduate student Cinda Heeren and NCSA research programmer Tom Magliery, a number of new activities were developed. Flyers were distributed to every school in Champaign-Urbana, and 38 of 106 applicants were selected to provide a balance by school representation, grades taught, and years of teaching experience.

During the week-long workshop, teachers were led through many of the activities to demonstrate not just the

content knowledge, the method of instruction, which engages participants in collective experimentation, and problem solving. Some examples of activities included:

- Eulerian Graphs, in which participants first try to solve the Seven Bridges of Königsberg puzzle by walking around on a large tarp depicting the town of Königsberg and its famous bridges. Afterwards, the notion of Eulerian graphs is explained and applied making balloon animals and solving puzzles of the draw-this-without-lifting-your-pencil type.
- Finite State Machines, in which participants try to infer the behavior of a fruit vendor. The vendor wears silly hats to depict his "state" of mind and responds to requests for apples or bananas by dispensing fruit and by changing hats. Finite state diagrams are introduced as a convenient way to model complex behavior, and participants are challenged to come up with their own designs (e.g., a finite state diagram reflecting the input/output behavior of your dog).
- Parallel Sorting Networks, in which participants walk on a large tarp with a circuit marked out with duct tape. The inputs (people) sort themselves alphabetically as they move through the network. This activity is useful for demonstrating the advantages of parallelism, especially if it follows a related activity on serial sorting algorithms involving balance scales.

Other lessons involved such diverse topics as minimum spanning tree, graph coloring, information-hiding protocols, data compression, error correction and magic tricks, circuit design, and robotic arm motion.


In a followup session in October, teachers reported on their successes (and failures) at bringing these activities into their classrooms. Evaluation of the project is being carried out by Matt Stuve, a College of Education postdoc.

The main lessons learned seem to be that the activities are indeed engaging, fun, and involve kids in collective thinking and problem solving. What remains difficult is helping teachers find ways to naturally incorporate the lessons into their standard curricula in a way that complements particular state and district educational goals and is amenable to assessment.

We hope to be able to offer the workshop again, assuming funding is available. Anyone interested in helping with these or similar projects aimed at K–12 education or CS popularization, is encouraged to contact me via e-mail at pitt@cs.uiuc.edu. ■



MATHmaniaCS participants walk through a Batcher odd/even parallel merge sort circuit on a net painted on a field south of the Beckman Institute.

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You will manage the TRIS+ Performance Laboratory Organization; develop testing processes and quality checks; hire, train and administer the laboratory staff; and provide organizational leadership. You should possess a Bachelor's degree (MBA preferred), three years' management experience, and ten years' database experience, three of which must be in performance measurement or tuning. Familiarity with software development, relational databases, performance analysis and testing, UNIX, Windows and DBA is a must.

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The qualified candidate will validate database designs for future three-tier client/server products, the distribution and replication features of the application's data schema, and the database design and integrity of the existing TRIS+ legacy product. You will also supervise and mentor DBA/database designers and advise on best RDBMS practices. You should have a Bachelor's degree, ten years' related experience, five years' experience with recent versions of ORACLE, and technical proficiency in large relational databases. Experience with three-tier object-oriented client/server environments, transaction processing monitors, and object-centric and data-centric development approaches is desired.

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Alum lands first OS on another planet



Mars Pathfinder

Jerry Fiddler's company, WindRiver Systems, can claim to have the first

operating system on another planet. "At least the first of terrestrial origin," Fiddler, MS'77, pointed out. WindRiver software controlled almost all of the functions for the NASA/JPL Pathfinder mission to Mars. This included the flight, the final descent and after-arrival manipulations (airbags, parachutes, the petals on the lander), the weather station, camera, and communications between the Pathfinder and JPL controllers on Earth.

To meet NASA demands for "better, faster, cheaper," an off-the-shelf OS was necessary to control the IBM RAD 6000 microprocessor. This was a special version of the microprocessor used in IBM's RS/6000, the computer inside Deep Blue, but instead of having 64 processors, it had 1. "At 20 MHz, the machine was much slower, but it's low power and radiation hardened, which is much more important for this application than speed," said Fiddler. It is also very reliable and works across a wide temperature range (temperatures dip to minus 100° at night).



"It's the same OS that's in your HP Desk Jet printer but imported to a different chip," he added.

The OS is WindRiver's VXWorks, a commercial OS used mostly in real-time, embedded applications. The spacecraft was launched less than three years after the project started, so according to Fiddler, there was no way anyone could have written an OS in that time.

"The project has gone extremely well," said Fiddler. "It's an incredibly exciting process." Fiddler hopes to be involved in the next Martian mission as well. WindRiver Systems is on a roll; it recently made *Fortune* magazine's 25 Cool Companies list (July 7, 1997). ■

<http://www.wrs.com/pathfinder>
<http://mpfwww.jpl.nasa.gov>

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CSGSO undergoes massive energy surge

The Computer Science Graduate Student Organization (CSGSO) is undergoing a resurgence under the helm of president Thomas Kwan and treasurer Luis Tavera. Together, they spent the summer brainstorming and strategizing on how to bring new vitality to the group and how to impact the rest of the department. This semester has abundantly shown the fruits of their labor.

To kick off the semester, CSGSO organized the department's first picnic in more than 10 years. About 200 graduate students, faculty, staff, and their families and friends gathered at Hessel Park in Champaign on Saturday, September 13, 1997, for food and festivities.

The traditional Friday Extravaganza (FE!) has been energized. For the first time, companies were invited to host these weekly gatherings of faculty and graduate students. Companies receive increased visibility among grad students and grad students receive nourishment, often in the form of Papa Del's pizza, as well as information about the sponsoring companies and their available positions. "This partnership between the companies and CSGSO has been extremely successful," said Kwan, noting that attendance is typically around 100 people. In fact, this year's FE!s are "sold out." (If your company would like to host an FE! in the future, email csgso@cs.uiuc.edu.)

This also marked the first year that CSGSO has held mini-seminars to help students navigate successfully through their graduate careers. Grad students get advice from their peers on general MS/PhD survival strategies,



Graduate students Alper Ungor, Zebadiah Kimmel, "the Phantom," and Dong Xie enjoy barbeque from Lil Porgy's at the fall picnic.

Zhigang Chen

course selection, housing, and some of the more mundane details of graduate student life. Michael Loui, ECE professor and associate dean of the Graduate College, talked about how to choose a thesis advisor. CS department head Dan Reed spoke about how to interview and find professional positions in academia. In cooperation with students from the College of Law, William Cook, a partner from the Chicago intellectual property law firm Brinks Hofer Gilson and Lione, was invited to talk about Web/Internet-related intellectual property legal issues.

"Initially, when Luis and I planned all this last summer," said Kwan, "we weren't sure how it was going to pan out. But we're really happy to see that the students were enthusiastic about all the activities. A lot of people

came to the picnic and the FE!s, and attendance at the seminars has been good." A substantial amount of work on these events was done during the summer," Tavera added, "and that turned out to be a good strategy. We're constantly about four months ahead of what we're going to do." Now that's an organization that's organized!

Thomas Kwan and Luis Tavera, both PhD candidates advised by Professor Dan Reed, plan to graduate next year and go into industry. Kwan's thesis topic is Java-based global computing. Tavera is writing his on replication and clustering for improved access to multimedia information on tertiary storage. ■

<http://www-csgso.cs.uiuc.edu/~csgso>



Graduate students Erick Cantu-Paz, Thomas Kwan, Javiera Cervini, Luis Tavera, and Carmen Vergara clean up. Tavera and Kwan are sporting CSGSO's new t-shirts.

Zhigang Chen

Tom Siebel leads Siebel Systems



Tom Siebel

Tom Siebel, BA History '75, MBA '83, MS '85, is founder, chairman, and CEO of Siebel Systems, a leader in sales force automation and the fastest growing client/server applications software company in history.

TOM SIEBEL seems to be everywhere these days. If you saw the special Silicon Valley issue of *BusinessWeek* (August 18, 1997) you would have seen his company, Siebel Systems, sprinkled throughout. After its initial public offering in June 1996, Siebel Systems was the fifth best-performing stock of 1996, and it is the fastest growing client/server applications software company in history. Only four years old, the company is still in megagrowth mode and commands 70 percent of the sales force automation market. As its founder, Siebel has

a 40 percent stake in the company; the rest is owned primarily by employees, of which he is particularly proud of. Siebel Systems is currently being used as a case study at the Stanford business school.

Siebel came to the University of Illinois from suburban Wilmette, Ill., although he went to high school in Minnesota. Interested in the history of ideas, science, and philosophy, Siebel chose to major in history, and he chose UI for its convenience. After graduating in 1975, he went to work for a publishing company in Ottawa, Ill. People in the publishing community, purveyors of information and entertainment, were still using fourteenth century technology. Why couldn't they apply emerging communications and computer technology to bring the publishing world into the twentieth century, Siebel wondered. That became his mission, and to carry it out, he felt it would be useful to learn about both business and computer science. So he returned to UIUC to pursue an MBA and an MS in computer science. His thesis adviser was Professor Geneva Belford, one of the early researchers in relational database theory.

When Siebel finished graduate school in 1983, the database market was only about \$20 million worldwide. Siebel got a call from a VP at Oracle, a fledgling company with about 40 employees, who was looking for someone with a background in relational database theory. The VP had been working with Sohaib Abbasi, BS'78, MS'80, at Oracle's Chicago office, and Abbasi had put him in touch with Professor Belford, who then referred him to Siebel. When Abbasi left the Chicago office for California, Siebel took his place in Chicago as a systems engineer. After about a year, Siebel migrated to sales and quickly rose to become the top sales person at Oracle. He continued up the ranks over the next five years, and by 1989, he was general manager of Oracle's direct marketing division. During his tenure with the direct marketing division, Siebel saw a great need for software to help automate the coordination of telemarketing, telesales, and field sales efforts to become more productive. After a fruitless search for packaged applications to accomplish this, Siebel designed and built a sales automation system using Oracle technology. The system, known as OASIS, is still in use at Oracle today. OASIS, however, limited by the technology available in the late 1980s, only partly executed Siebel's vision of sales people using their desktop computers to solve their problems, leveraging things like relational databases, multimedia, and object-oriented technology. Oracle was not interested in capitalizing upon this idea externally, and this untapped opportunity was to pay off for Siebel.

Siebel left Oracle in 1990 to become COO of Gain Technology, the multimedia software maker. By 1991, he had become its CEO and engineered the company's acquisition by database maker Sybase in late 1992. The money Siebel made from the Gain sale allowed him to found Siebel Systems without any venture capital, which gave him the freedom he desired to execute his vision with an emerging class of

object-oriented technology as well as the opportunity to make his new company employee-owned.

The early days were typical of a startup—crummy office space, used furniture, and crazy hours. “I always knew it was going to be successful,” Siebel said. “I knew the market was there, and if someone built a system, that market would be large. We didn’t need any net new technology to succeed. It was just a matter of getting the right people, so I called some friends and said ‘Let’s go!’ But I never could have conceived of the growth that we’ve had. It’s exceeded anything that we could have anticipated. We went from \$8 million to \$40 million to a \$100 million run rate in three years.” The company now employs about 350 people worldwide and is headquartered in San Mateo, Calif., down the street from Oracle.

In 1995, Siebel Systems introduced its first product, the Siebel Sales Enterprise, a program that provides customer representatives all the information they need, including customer competitive and product data, on the desk top. It runs on a database server linked via a wide-area network to sales people in branches using PCs. This product was followed in 1996 by the Siebel Service Enterprise, designed to automate the customer service function. These programs were developed using C++, ActiveX Controls, and Java. Siebel Systems has formed strong partnerships with companies such as Andersen Consulting, NTT, and Microsoft, and it boasts an impressive list of clients including Charles Schwab & Co., Cisco Systems, and Compaq Computer Corp. Although Siebel Systems has far outpaced its rivals, including Aurum Software, Dendrite, and Brock International, it cannot afford to slow down. The drive, as always, is to develop new products that are better, faster, more functional, and Internet enabled. Siebel Systems is expanding its global reach into Europe, Asia, and North and South America.

Technical challenges loom large. Very large sales organizations typically employ thousands or tens of thousands of people who are geographically dispersed and nomadic. They operate with intermittently connected database sharing that requires data synchronization and replication at the transaction level. One difficult problem Siebel Systems has solved is how to use the Internet as a virtual wide-area network that can deploy application software in client-server mode. Siebel Systems is also aggressively researching software agent technology. The goal is to develop deployable virtual sales and buying agents that can interoperate over the Internet as proxies of their handlers. A fundamental challenge is how to engineer the actual behavior of such software agents so they can accurately represent buyers and sellers.

With a company as hot as Siebel Systems, one might expect Tom Siebel to be putting in ridiculous hours and logging zillions of flight miles. Although admittedly busy, busy, busy, he does have time for a life with his wife, Stacey, and three young children. Relaxation time is spent camping or sailing. He also found time to co-author a book, with Michael S. Malone, called *Virtual Selling* (Free Press, 1996). According to *The New York Times*, the book takes the notion of virtual management—less hierarchical and highly decentralized—and applies it to selling.

“I don’t miss the Midwest,” Siebel said, “but I do miss graduate school at Illinois. Really, for those who are geared up to take advantage of it, they can have the experience of a lifetime. What you have provided at no cost is access to virtually any resource that you can conceive of. If you want a nuclear reactor, golf course, radio telescope, supercomputer At no other time and place in your life will you have instant access to an infinite wealth of resources.” His advice to students? Take advantage of all you’ve got at Illinois. ■

<http://www.siebel.com>

Sohaib Abbasi at Oracle

Sohaib Abbasi, BS'78, MS'80, early researcher of relational databases, is senior vice president of the Tools Division at Oracle.

SOHAIB ABBASI, BS'78, MS'80, joined Oracle in 1982 as one of only two sales support people in the Midwest. Now he's in California and is senior vice president and general manager of the Tools Product Division, the division encompassing application development tools, groupware and collaboration tools, end user query tools, and new media tools.

Abbasi came to Illinois from Pakistan, a country that emphasized traditional engineering but had very little to offer in terms of computer science education. During his senior year he developed the interest in relational databases that would lead to his eventual career in that area. "I enjoyed UI a lot, and I learned a lot," he said. "Clearly, I came in not knowing anything at all about computers. Learning about software and software engineering was extremely valuable. I learned about relational databases long before anyone else was talking about it in the commercial world."

When Abbasi was a student, no companies were committed to working on relational databases. In 1970, IBM researcher Ted Codd introduced the relational data model in his landmark *Communications of the ACM* paper (E. F. Codd. "A Relational Model of Data for Large Shared Data Banks" *CACM* 13, 6 June 1970, pp. 377-387). Codd's model led to the development of the INGRES and SYSTEM R prototype database systems. INGRES (INteractive Graphics and REtrieval System) was developed at UC Berkeley, and in fact, Berkeley UNIX started as a modification to UNIX to provide a better OS environment for INGRES. SYSTEM R was developed by IBM, and it introduced the relational database language SQL (Structured Query Language), now the industry standard.

In 1977, Bob Miner, BS Math'63, Ed Oates, and Bruce Scott formed a company called Software Development Laboratories to commercialize some of these ideas, and a few months later, they were joined by Larry Ellison (who attended UI in finance in 1966 before transferring to the University of Chicago). The company struggled to find financial backing and supported itself by doing consulting work. In 1979, the company

changed its name to Relational Software Inc., and the first version of ORACLE was released. Oddly enough, its first customer was Wright-Patterson Air Force Base. ORACLE was originally written in DEC assembly language for the PDP/11, and when it was recoded in C, it was probably the first commercial system ever written in C.

In 1983, Relational Software Inc. changed its name to Oracle. Oracle wasn't the only database maker to change its company name to that of its product. Relational Technology Inc. changed its name to Ingres Corp. (which was eventually bought by Computer Associates International Inc.), and Relational Database Systems Inc. changed its name to Informix Software Inc. (Sybase Inc. came later, in 1984, and didn't undergo any name changes.)

Abbasi was particularly interested in how computer technology could be applied to business. "In accounting classes," he said, "we talked about how the information needed to be organized for the accounting applications to be implemented. The key technology that made computers so valuable from a business point of view was to have a way for people to share information, and the relational model appeared a lot simpler than any others out there." Abbasi went on to graduate school and wrote his MS thesis on relational databases under the direction of Professor Geneva Belford.

Abbasi spent the first two years of his career at Professional Computer Resources (PCR), a company in Oakbrook, Ill., where he developed financial accounting applications for System/38. This was IBM's new minicomputer which came with a built-in database. He was disappointed to find out, though, that the System/38 database was not truly relational. The company was eventually acquired by Computer Associates.

During this time, Abbasi attended a software show in Chicago where several companies were demonstrating relational databases. Until then, he was unaware of any companies building commercial database systems based on Codd's

relational model. The company that caught his eye was Relational Software Inc., and its product was ORACLE. Abbasi met with president Larry Ellison, and three weeks later, he joined the company, which at the time employed about 30 people. Abbasi started in its Chicago-based sales office as 1 of only 2 Oracle employees providing customer support in 13 Midwestern states. "It was a challenging time to be out in the field," he said, "because people were debating whether relational databases would ever work. We had discussions with Fortune 500 prospects on how to utilize this new technology and whether it would ever be suitable for their production systems." Abbasi recalled a meeting with an auto executive who declared, "Regardless of what you say, I won't buy from you. We only buy from IBM." They were using previous generations of database systems, such as IBM IMS (Information Management System), which were networked and hierarchical databases, or they were using file systems. But once they saw their own data on ORACLE, Abbasi explained, they became converts. These initial sales had some of the elements of development and simple prototyping that Abbasi missed working on. He transferred to development in California, but before he went, he hired Tom Siebel, AB History '75, MBA '83, MS '85, another of Geneva Belford's advisees, to take his place in the Chicago office. Siebel went on to found Siebel Systems, the leading sales automation software company.

In 1984, Abbasi was 1 of 2 programmers responsible for development tools at Oracle. He wrote the SQL*Forms Version 1 development environment and has been managing the tools group ever since. SQL*Forms is now part of Developer/2000, Oracle's flagship application development tool. A key area that Oracle is now investing in is developing applications for "the new platform—network computing." Abbasi believes that people are looking for ways to develop applications for thin clients with scalable application servers and databases, as opposed to applications for traditional client/server systems. By providing a distributed-computing environment that is network-centric—with Java on the client, the application server, and the data server—the complexity is moved away from the client and onto the network where it can be better



Sohaib Abbasi with former adviser Professor Geneva Belford during a visit to campus earlier this year.

managed and more economical. "There is cost benefit and economy of scale, accessibility, and immediate access to all these applications. As the network platform evolves, new capabilities are added," Abbasi said. "We need to track the platform, augment it, and provide the best development environment."

Abbasi believes that research should focus on how to evolve the network computing platform for hosting more demanding applications (e.g., transaction intensive, secure) so that it could be used for electronic commerce. Abbasi also believes in the importance of hardware innovation and optimization for the network platform to be maximally effective. The future with regard to whether the world will readily adopt this new platform is still uncertain. "There is debate about whether Microsoft is willing to help promote an alternative to Windows," he said. "At first, they felt they had to support Java, but now Microsoft is clearly viewing Java as a threat. They want to position it narrowly, as just a language. But we believe it's a platform beyond just a language. There are services people are developing so that Java becomes the platform."

Oracle has quickly grown to become one of the world's largest software companies, and Oracle8 was recently released. Much of the company's success can surely be attributed to the effort and talent of Sohaib Abbasi.

Sohaib Abbasi lives in Atherton, Calif., with his wife, Sara, and their three young children. ■

<http://www.oracle.com>

Two California VCs from DCL: David E. Gold and E. David Crockett

David E. Gold and E. David Crockett share more than just names, Alma Maters, and careers as venture capitalists in Silicon Valley. Their paths often crossed, although they took very different routes to where they are now. Says Gold, "We've actually lived each other's lives, but at different times." Here are their stories.

David E. Gold, BS EE'67, MS'69, PhD'72, made the transition from techie to VC and is now a partner with Indosuez Ventures in Menlo Park.

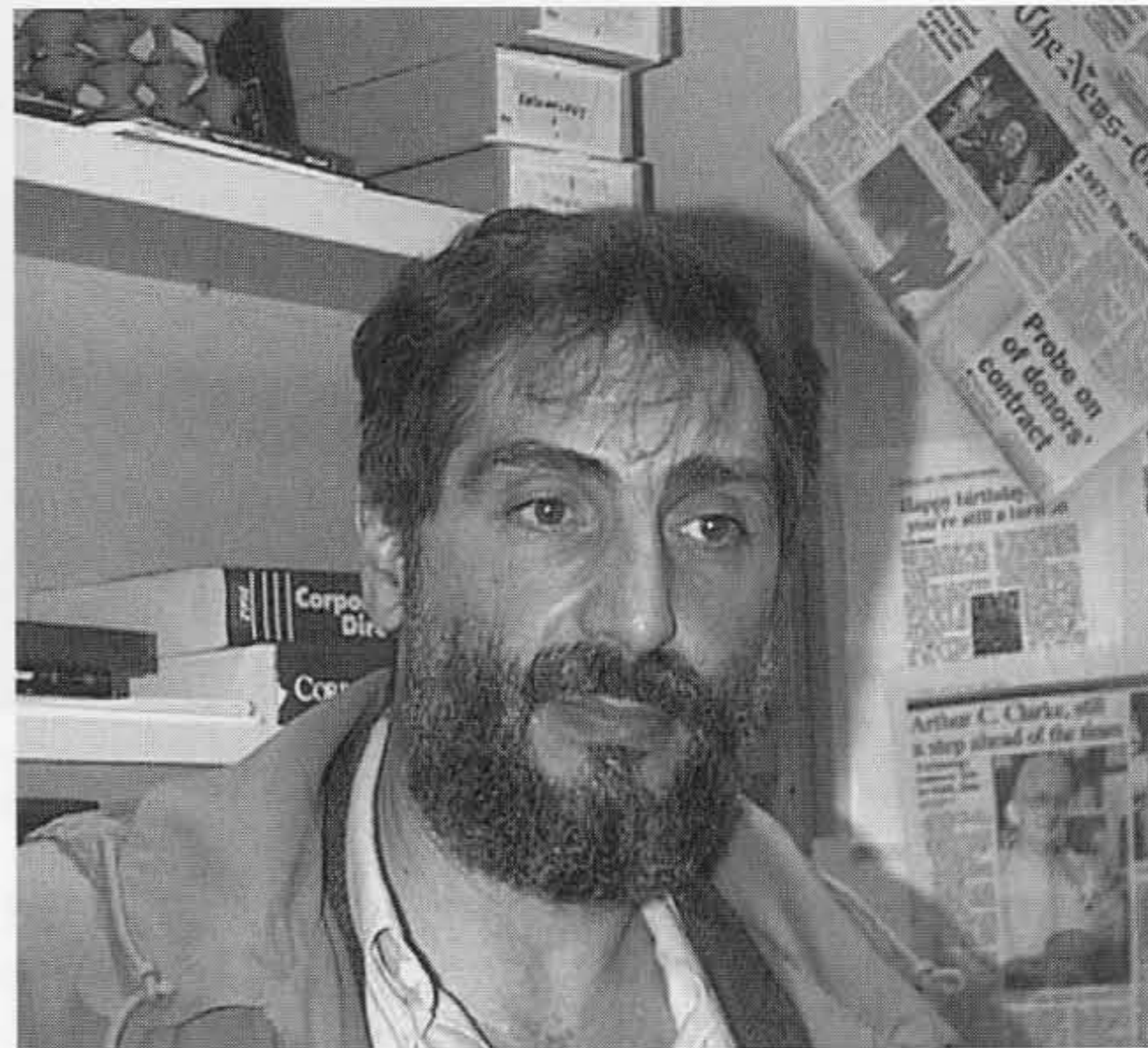
David E. Gold

grew up in Chicago and attended high school in Palatine when the area was mostly cornfields. He started UI in 1961 not at Urbana-Champaign but at the Navy Pier campus in Chicago, a precursor to UI-Chicago Circle. The foreign language requirement killed him; he flunked out and started working at a couple of non-technical jobs, like bagging groceries and stacking cans at Jewel. Gold

returned to school to study mathematics, but to dodge the dreaded foreign language requirement, he enrolled in electrical engineering, again at Navy Pier. It was 1963. Programming an IBM 1620 in Fortran and assembler, waiting in line at the keypunch machine at school, Gold caught the eye of an instructor who helped him land his first programming job, at Argonne National Laboratory.

In 1965, Gold had exhausted all the Chicago courses, which by that time were taught at the university's newly established Chicago Circle campus (the Navy Pier campus was subsequently closed). Genuinely interested in computers and how they worked, Gold decided to acquire "knowledge for the sake of knowledge." The Viet Nam war was raging on and getting a student deferment became a real issue as well. In 1967, Gold completed his EE degree and started graduate school at UIUC. "Graduate school, post-coursework, for me at the time was a form of enforced leisure. I got a great office that I often didn't get to until noon. I had lots of time to read *The Wall Street Journal*," he recalled. He also spent a lot of time working on cars to earn some spare cash, an activity he still enjoys. Gold drives a good old Midwestern automobile, a Corvette.

Gold found his CS courses to be fascinating, and at some point, he realized that he could "hang around and do a little work on his thesis and earn \$350 a month as an RA on ILLIAC IV." He did this work for Professor David Kuck, his adviser, and hourly work for Professor Jim Snyder. To supplement this income, he taught at



David E. Gold, at the Big Iron reunion during Cyberfest last spring.

Parkland College and managed a modest investment portfolio.

The foreign language requirement specter was still there—a combination of French, Russian, or German was required for the PhD. "I got together with another ILLIAC IV guy, Richard Marks, and tried to get the requirement removed by surveying faculty members about why there was a language requirement. In spite of our clever statistical analysis showing that French, Russian, and German were archaic, most faculty felt like it was still good. We then took the case to John Pasta, the head of the department [from 1964 to 1970]. We got the faculty to give in a little by reducing the requirement from two languages to one, and this language could be any language.

Having been married since he started graduate school, Gold settled into a "comfortable rut" in Urbana. It all came crashing down, however, when the powers that be caught on that some folks were a little too comfortable hanging around the lab, showing little signs of progress toward the degree. Gold was one of these folks; his financial support was yanked. Gold became a TA for Professor Tom Murrell, along with all the trappings a teaching assistantship implied—following rules and keeping regular hours. He was miserable; he simply had to finish his thesis, which he did in 1972.

Gold was certain of two things: he was going to live somewhere warm, and he was going to be a computer science professor. "In the early 1970s," he explained, "there was no shortage of opportunities. Every college was starting a computer science department." He interviewed with IBM on a lark, and they made him an offer—one he couldn't refuse—to work in their corporate think tank, the Advanced Systems Development Division (ASDD) in Los Gatos, Calif. "I was in the same, exact, highly specialized group that Dave Crockett [PhD EE'76] was in. I knew E. David Crockett's name from publications. I saw his footprints all over IBM, but when I joined he had gone to Hewlett-Packard." Gold spent his first two years at IBM as a "technical guy" and then entered market planning and product planning for another three years. "I got a good dose of what it means to have to take a highly technical product to the market place and price it, support it, and manage over the product lifetime. It was a good education." However, it was a form of internal selling. Gold felt that his managers simply wanted confirmation of plans they had already made.

In 1977, Gold left to join a "small, not-very-interesting market research firm." "I wanted to do market research in an environment where I hadn't been told what the answer was before I had done the research," he said. He lasted there for a year. "Sort of by accident," he explained, "I'd had several consulting assignments for venture capital firms. Each pulled together everything I'd done in my past life. I had to be smart about technology, critique the business model, figure out the distribution and sales method, and analyze it. At that time the VC community was mostly business oriented. I had to explain what the hell it was that was going on, in English. I had to explain what the buzzwords were, so it was similar to teaching. It was really slick. This was a grownup version of being a teacher." In 1978, Gold set up his own practice consulting to VC firms, of which there were only about 200 compared to 400 now. He worked like a dog with "no life outside of work," he confessed, and he found himself single again.

After several years, and realizing that his clients were making even more money than he was by leveraging his advice, Gold asked himself why he wasn't in the VC biz. "Like having stock or equity, you build value over time (as a VC). As a consultant, however, all you can do is sell your time, but you can't leverage it." He also realized that because of his technical expertise, he had more specialized, technical knowledge than they did. He started getting feelers from VCs to join their firms and in 1985, he was recruited to Indosuez Ventures, where he now works. Because of the company's affiliation with Banque Indosuez, Gold became fluent in French by default.

Indosuez Ventures has a tremendous track record as the only investor in Informix, one of two investors of Cisco Systems, as well as an investor in Stratacom, Sierra Semiconductor, Vitesse Semiconductor, and Ventritex (manufacturers of defibrillators). "It's possible to be a VC with only a few million and do seed stage deals. We do relatively low cap deals where the investee company needs no more than, say, \$5 million total aggregate equity capital prior to positive cash flow. These deals are typically not of interest to large venture funds." For example, the Informix investment was around \$350,000. The total Cisco investment was around \$2.5 million, \$400,000 of which came from Indosuez Ventures. This latter one is now worth more than 100 times in value.

"If you can't get several times your money back, it's not worth it," Gold said. "About a third of these investments fail. What you want to see is about ten times or more on your money on winners."

And the risks? "VCs have to make decisions based on an imperfect view of the future, with incomplete information. You're not sure of a company's capabilities or their product development cycle. You're not even sure what the market will be. There are additional gaps in knowledge with respect to competitive products or new technologies coming along," said Gold. "So you do a lot of homework, a lot of thinking, and talking with people you know in your network. But in the final analysis, it's an educated guess."

These days, it is extremely difficult to break into the VC business. Despite the fact that the industry has been growing over the last several years, it has also been contracting. Fewer firms are managing more dollars than five years ago. Gold estimates that in any given year, only about a dozen new people are hired in Silicon Valley venture firms, and probably fewer than 100 in the entire venture industry. As an apprenticeship business, people are typically hired at low levels and have to work their way up the ladder. Successful VCs have either had an operating position at a company or come out of business school with work experience. VC money is typically raised from others rather than being dependent on individual wealth. All of Indosuez's investors are overseas. To sign them on, Gold and his colleagues go to clients and contacts that Banque Indosuez has. These include financial institutions, banks, insurance companies, pension funds, retirement programs, or high net worth individuals (who make up about a third of the investment pool).

How does a company go about obtaining venture capital? First, they must understand the VC network. "VCs are fairly friendly with each other," said Gold. "It doesn't serve a company well to shop a deal and send a business plan everywhere. The challenge is for them to find no more than a handful of groups with which they

will be compatible. There's sometimes a notion of competition but VCs may turn out to be partners on other deals the next month." Face it, everyone knows everyone else. People seeking venture money should start by reading *Pratt's Guide to Venture Capital Sources*. There are also regional groups, such as the Western Association of Venture Capitalists, which publish directories. "The first source of money (for an entrepreneur) should be themselves and the second should be their customer. This is standard advice for entrepreneurs: Get as far along as possible by yourselves. Grow as large as you can and have as much to show as you can before contacting a VC. Often one shouldn't even talk to a VC unless one needs millions. You won't even show up on the radar if you're asking for thousands. Even if you make them five or ten times the money, it's not going to be worth the risk, the time, or the energy at the end of the day."

A typical day for Gold starts with early morning racquetball (he's up at 5, playing by 6), quite a turnaround from his night owl life in graduate school. About 50 hours a week are devoted to work, which sometimes spills into his home as he takes conference calls at all hours. A great deal of time is spent reading the paper, checking stock prices, talking on the phone, more reading, attending board meetings (he's currently on six boards on the West coast), flying, reading business plans, meeting new companies at their place or his. He tries to complete a few deals each year, perhaps two personally, and manages the ones he currently has. He makes his home on six acres high on the hills above Silicon Valley. Each fall, he splits wood from his property to heat his house.

Gold speaks highly of his experience at Illinois. "I got a strong appreciation of the work ethic and a sense of responsibility," he said. "I learned a lot about computers and systems design and optimization and how things work. The knowledge was useful and still is in a very general sense. I also had a lot of time to read *The Wall Street Journal* and make investments, and now I'm a professional investor." He misses the collegiate atmosphere. "I was always going to live in a college town. The friends I had at Illinois were both townies and university folks that had a distinctly Midwestern sense of values, almost by definition." Every now and then, he assumes the role of professor by teaching at San Jose State University. And although two years of a foreign language in high school is required for admission to the College of Engineering at UIUC, the foreign language requirement for undergraduates and graduate students no longer exists. The monster is dead. ■

E. David Crockett

was always good at math and science. Coming from a family of economists and political scientists, he wanted to be different, so he decided to study engineering. As a child, he hung out the University of Colorado's electrical engineering department in Boulder. It was all giant motors and generators back then, and according to most professors, anything not related to power, such as radio work or anything involving vacuum tubes, wasn't worth studying. Big power generators sort of scared Crockett, so he began college in architecture at Colorado. An aversion to drafting prompted him to switch to electrical engineering and transfer to Brigham Young University, where he earned his bachelor's degree in EE. At BYU Crockett became interested in computers. It was 1961. "One of my professors said that computers were a dead end street," he laughingly recalled. "About all the computer power necessary was already designed and there wouldn't be any challenges." At a time when it seemed everyone was going into aerospace engineering, Crockett went to work for IBM, where he developed the first acoustic coupled modem and did pioneering work on graphic displays (CRTs).

Crockett took advantage of an IBM fellowship program in which the company would send two people each year to graduate school while paying a full salary. Having just completed an MS in EE via a work-study program at Stanford University, continuing school was a good option. Although he could choose any school he wanted, Crockett chose to attend UIUC because of his fascination with the work going on with ILLIACs II and IV. "I really liked Illinois. The MS classes at Stanford were gigantic, and I didn't get to know the professors," he said. "Illinois was so great, I got to know the professors and had Cokes with them after class, which I thoroughly enjoyed." He recalled with great fondness CS professors Saburo Muroga, Ted Poppelbaum, and Jim Robertson, as well as math professor Franz Hohn. He was especially high in his praise of Professor Gernot (Gerry) Metze, his official adviser, and Professor Mac Van Valkenburg, his informal adviser.

Crockett's office was in the Coordinated Science Laboratory, a lab that embraced a variety of science and engineering topics, and classes were split between DCL and the EE building. Through Metze and Van Valkenburg, Crockett got to know EE professors Tim Trick, Bill Perkins, and student Ed Davidson. Crockett's thesis, mathematical in nature, was on automata theory and sequential machines.

After earning his PhD, it was back to IBM where Crockett worked on silicon compilers and computer simulation techniques for designing computers. Then they wanted him to work on communications again. "It



E. David Crockett

E. David Crockett, PhD EE'67, after a long career in technical and operational positions in a variety of high tech firms, is now a VC with Aspen Ventures.

was interesting," he said of IBM's first modem development. "They didn't bother to patent it; they didn't see any future in it." Because of the Carter phone case, a famous lawsuit in the mid-1950s that prohibited anyone from physically connecting to AT&T phone lines, people had to connect using their telephone's receiver. "Bell Labs said it couldn't be done," said Crockett, "but the acoustic coupled modem worked very well. IBM produced 25,000 for internal use to communicate with timeshare computers." The modem was nicknamed Crockett Box, and it formed the basis for Livermore Data Systems and many of the other modem manufacturers to follow.

Following a yen to become involved in something more entrepreneurial, Crockett left IBM and joined Computer Synectics to produce products for performance evaluation of mainframes. The late 1960s marked the early days of venture capital in Silicon Valley. Early VCs Tom Perkins (Kleiner Perkins Caufield & Byers) and Sandy Robertson (Robertson Stevens) were on Computer Synectics' board. When the company was sold to Test Data, Crockett became engineering manager at Communications Products, a company that made terminal control units for mainframes. The company was bought by Memorex, and Crockett worked for Al Shugart, who later founded Seagate in 1979. (In 1980, Seagate built the industry's first 5.25-inch hard drive).

Crockett joined Hewlett-Packard in 1971 for an exciting nine years. HP was quite small at the time, with computer revenues at around \$50 million. After about the first week, Crockett was called into a board meeting; Bill Hewlett and David Packard were there trying to decide whether to drop the HP 3000. The product had just been announced, but it didn't work!

At that meeting, Hewlett turned to Crockett and said he was anxious to hear what Crockett had to say about that. "I was the sacrificial lamb," recalled Crockett. "I said don't scrap it. They didn't, and it became the most successful commercial product they ever had until the printers came on." Crockett went on to hold various jobs at HP—development manager, division manager, computer strategy manager, and eventually director of computer research and development. By the time Crockett left the company, HP's revenues had grown to \$2 billion, and it was on its way to become the country's second largest computer company. "I remember Hewlett used to argue that it was sort of ridiculous for HP to try to be successful in computers. He said, 'Never take a fortified hill,'" referring to IBM and the "Seven Dwarfs" of 1971: Burroughs, Control Data, General Electric, Honeywell, RCA, Scientific Data Systems, and UNIVAC. At that time DEC and HP didn't even qualify to be dwarfs. In the instrument business, HP's only competitors were General Instruments and Tektronix.

Computers prevailed at HP, and Crockett described those days as a "total clash of cultures." Most HP employees were uncomfortable with the computer operations, referring to its Cupertino computer site as "The Zoo." Crockett described how the computer operations people wore costumes to work on Halloween, a corporate first. "It was a fun place to work," he said. "You had a lot of responsibility, and it was very much like a startup. The first job I had at HP was systems manager of the HP 3000. I got to coordinate the various operations, and when the product was shipped, I even ended up teaching Cobol, RPG, computer architecture, and business prospecting classes to the field force."

Crockett left HP in 1980 to become president of Dataquest, a leading market research firm. Why did he

CSL: Coordinated Science Laboratory

Established in 1951 as a unit of the College of Engineering, the Coordinated Science Laboratory has a long and distinguished history in interdisciplinary research. Current CSL activities include semiconductor and thin-film physics, VLSI circuits and systems, computer systems and software, communications systems and networks, and control and signal processing. The Department of Computer Science is affiliated with CSL, and CSL has moved from its old location on the corner of Springfield and Mathews to the Computer and Systems Research Laboratory on the Beckman Quad.

<http://www.csl.uiuc.edu>

leave HP? Crockett recalled some pearls of wisdom from Mac Van Valkenburg, who had once said, "It's necessary to repot yourself every so often." The job at Dataquest was similar to what he had to do at HP—understand the market and market dynamics. In his five years as president, Crockett did a fair amount of consulting and international travel, especially in the Far East, which he considered a nice change from Europe where he had previously traveled.

After Dataquest, Crockett became president of Pyramid Technology, a company that sold high-performance servers. He took the company public, and it is now part of Siemens. And then, Crockett took the plunge and became a venture capitalist.

"Nowadays people in venture capital typically get an MBA and then go straight into VC, or maybe work a few years," said Crockett. "Not many of us have been in operational positions, although in the early days there were more." Crockett cited Tom Perkins, Burt McMurty (founding partner of several venture firms including Institutional Venture Associates and Technology Venture Investors), and J. Burgess Jamieson (co-founder of Sigma Partners) as examples of VCs who had come from technical management positions. "I think it helps to both understand technology and the operations of a business; you understand what it takes to make them successful."

The new company, established in 1991, was named Aspen Ventures, according to Crockett, because it was early in the alphabet, easy to remember, and the Aspen tree is nurturing. "My wife will tell you that it's because Aspen's her home town," he added. (He recalled that she was high school valedictorian of a class of nine that met in Aspen's Jerome Hotel.) Aspen Ventures is actually a spin-off of a late-stage British VC firm, with twelve partners, called 3i Plc. Aspen originally had six partners, three on each coast. Now Crockett is one of three, and it's all west coast. "The decision process is easier. We work with early-stage companies, and it gives us a chance to get really close to their offices, to see them every week." Companies Aspen has backed include Cornerstone Imaging, Qualix Group, iband (now part of Macromedia), Sierra Semiconductor, and Microlinear.

What is a typical day like for Crockett? "Every day I meet with some entrepreneurs, go to some board meetings, review new plans. There's always a lot of variety," he said. Probably more time is spent analyzing the potential market more than anything else when deciding whether to fund a company. "We feel quite comfortable with the technology and can analyze that rather quickly. We have to see if there is a potential market, but we also don't want it to be so big that we're swamped by all the other VCs. So we tend to focus on software for business-

to-business solutions, such as telecommunications and fabless semiconductor companies, rather than the consumer markets. We like being in at the very early stage and are normally the first investors," he said.

Crockett likes what he does. "In the days when I got a PhD," he said, "it was sort of like everyone went into teaching if they were any good. You went into industry if you didn't make it in teaching. I came to industry—I never wanted to go into teaching, even though I taught some classes at Stanford. When I left Illinois, I kind of apologized to Van Valkenburg, who said, 'Yeah, you'll probably go back into teaching someday.' But being a VC is more like one-to-one teaching. In fact, it's very much analogous to teaching: you're trying to help a company become successful. If the company makes it, it's because they worked so hard. If it fails, it's because there wasn't enough VC support!"

Crockett credits much of his success to his education at Illinois. "I liked the way the Illinois teachers taught fundamentals and incremental problem solving," he said. "You tried to derive everything from some fundamental precept and if you could solve each step, you'd eventually have the total solution. That applies a lot to trying to help companies develop. People either tend to get too far ahead of what they're trying to do, whether they're building a company or solving a problem. You have to do it in incremental stages, and if you can do each step, it'll all work out."

Crockett has served on more than 20 boards, 6 of which were public companies. He has now whittled the number down to 10. One board that has offered the greatest continuity, 17 years, has been Herman Miller, which gets him back to the Midwest and ties in with his personal interest in architecture. Crockett also has a strong interest in opera, which he developed when he lived in Germany during his junior year of high school. He admits to missing the people he knew at Illinois, and he particularly misses the campus and its many musical activities. "I do not miss the weather," he said. "In terrible winter weather, you traveled across campus by going from building to building. Then in the summer, you have to do the same thing because it's so hot." ■

Mac Van Valkenburg, 1921–97

Mac E. Van Valkenburg, an EE faculty member since 1955, went on to become dean of the College of Engineering from 1984-88. He died on March 19, 1997, and a memorial symposium was held in his honor on campus on November 15, 1997. Crockett gave the closing remarks at that symposium.

Rob Ekblaw's Illini roots run deep



Rob Ekblaw

Homecoming is a little more special to Rob Ekblaw, BS'87, than to most other alums. That's because his great-uncle, W. Elmer Ekblaw, was the originator of Homecoming—and Illinois had the nation's first one! Rob is a third generation UI alum and descendent of the Ekblaw family, Swedish farmers who settled

in the Paxton-Rantoul area in the late 1800s.

Rob explained that the tradition that was to become Homecoming started as a fundraising event for Elmer's fraternity, Acacia. Many Acacia grads went on to successful careers, but they rarely came back to the university. Elmer wanted to come up with a PR event that would get these grads back so that they could see the fraternity again and in turn, support it. The first event, in 1910, was small but encouraging enough to try again. The second involved several other fraternities, and the turnout was better. The name Homecoming was coined in 1913–14 as a way to establish the idea of the university as home, and in this sense, to get alumni to consider all the things the university provided them as students. Other fraternity houses picked up on the idea, but it wasn't until the early 1920s that it became coordinated across the university. As time went on, people carried the concept with them to other universities, mainly through the fraternity system. The football aspect and the parade were added later. The rest, as they say, is history.

Elmer Ekblaw was an important part of other aspects in the history of the university and surrounding community. He was editor of the *Daily Illini*, executive secretary for the campaign to build Memorial Stadium, national president of Acacia, and first president of the Champaign Kiwanis Club. But perhaps he is most noted for his role as botanist and geologist for the MacMillan Crocker Land expedition. Elmer was BA'10, AM'12, and as a research fellow at the university he was a member of the famous and hazardous expedition in search of an island called Crocker Land, somewhere off the coast of Greenland. When it was found that no such island existed, the expedition headed toward the Greenland coastal mountains, Ellesmere Land, Axel Heiberg Land, and other

remote arctic areas. You can find a signed copy of his book, *Along Unknown Shores* (Harper, 1918) in the University Library stacks.

Rob Ekblaw had another uncle who also played an important role in the shaping of the university. Karl Ekblaw, BS'09, MS'18, was the first president of the University of Illinois Alumni Association and one of the incorporators of the University of Illinois Foundation. A faculty member in agricultural engineering, Karl took the lead in urging the construction of the Illini Union, along with A. C. Willard, who was then president of the university (Willard Airport is named for him). When Karl was a student, he and a group of his fellow students from the class of '09 met to form the first Illinois Union, the organization that guided student men's activities.

There are other Ekblaws who have attended the university, including Rob's parents, but only Rob has a computer science degree. Rob grew up in upstate New York but after many visits to his grandparents in Champaign-Urbana, it seemed almost natural for him to return to Illinois to go to school. Rob had taken a computer course in high school that used the computers at a nearby General Electric facility. He went from punch tape to an Apple II and by 1981, he knew he wanted to study computer science. As an undergrad, Rob became a research assistant for Professor Mike Faiman and worked on a computer-aided logic design pack. He was also active in ACM, particularly in the annual programming contests the group used to conduct among Illinois high school students, and was also an editor of *The Technograph*. When he graduated in 1987, he joined IBM. After four years, and doing a variety of mainframe related jobs including systems testing, he started his own company, Breakthrough Consulting. He is currently doing support and development of computer applications for HFS Mobility Services in Danbury, Conn., a nationwide real estate relocation company. In addition to his career, Rob is a volunteer with Landmark Education, a firm that coordinates personal development seminars.

Since 1983, Rob has been writing science fiction. His book, *Teran Force Twelve*, is the first in a series, which contains some references to the ILLIAC machines and landmarks of the university. Look for it in bookstores this spring. Rob continues his family's legacy and his desire to make a difference by his support for the Department of Computer Science. ■



Alex Zoghlin on a roll with Neoglyphics

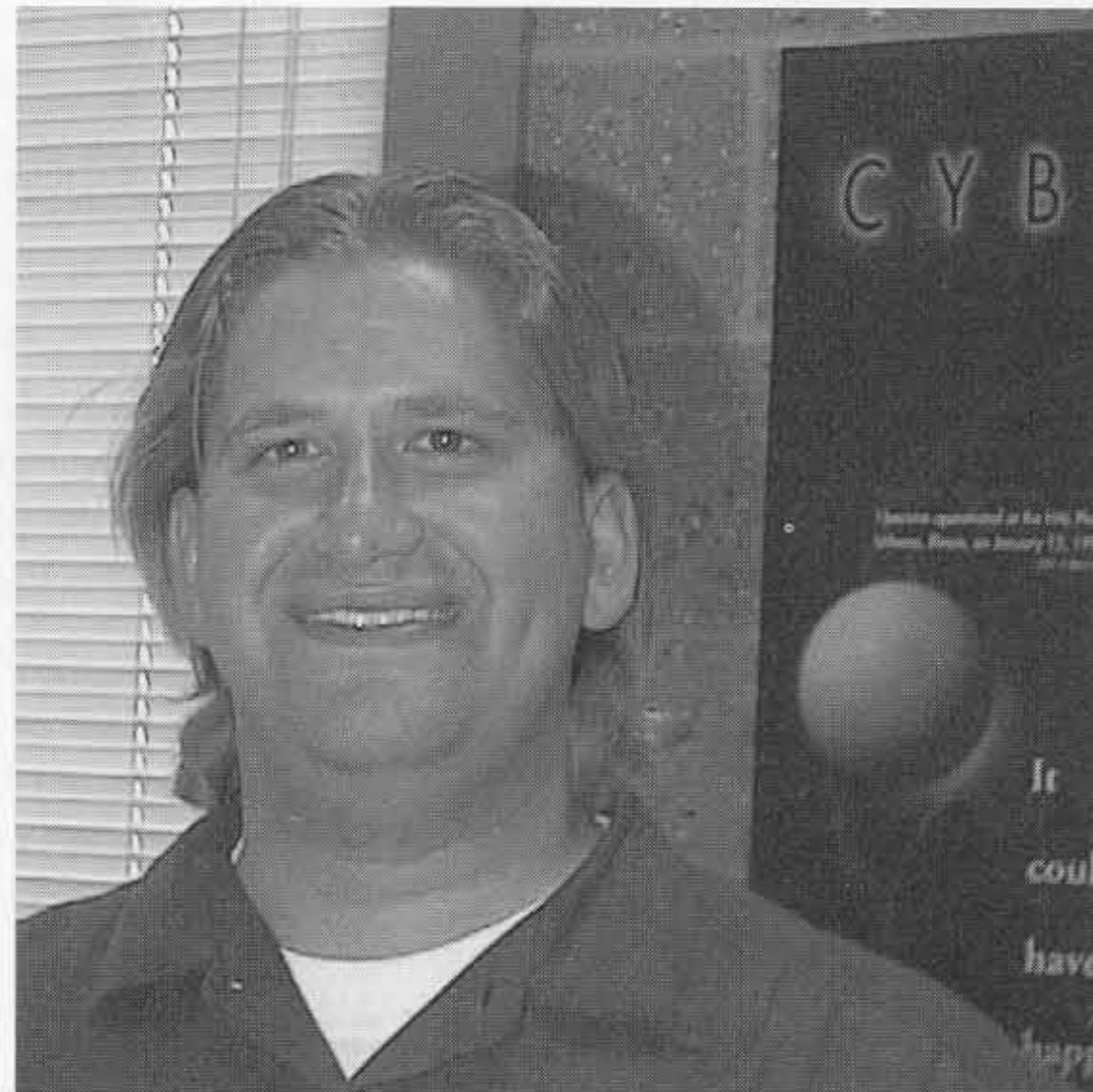
Alex Zoghlin's Chicago-based company, Neoglyphics, is making headlines in Web consulting.

Although Alex Zoghlin is not an alum yet, more than half of his company's development staff are CS alumni from Illinois. Zoghlin, who is 27, founded Neoglyphics, a Web design and consulting company based in the Bucktown neighborhood of Chicago. His efforts landed Neoglyphics in *Fortune* magazine's 25 Cool Companies list (July 7, 1997)—the only Midwest company to make the cut. In 1996, Zoghlin was listed in the honor roll of *Inter@ctive Week's* most influential people on the Net (December 2, 1996). Not bad for the president of a three-year-old company.

Originally from Wilmette, Ill., Zoghlin is proud of his choice to locate Neoglyphics' headquarters to Chicago. "Whenever I go to California, and I'll be eating in Palo Alto or something, I'll see so many people from UIUC. That's a shame. Illinois graduates so many good graduates, and they move!" Zoghlin built Neoglyphics by taking advantage of the characteristic talented people often have to flock together, and he encouraged his new employees to recruit their friends. He witnessed firsthand how successful this strategy can be when he was a student worker at the National Center for Supercomputing Applications during the formation of Jim Clark's Netscape team. Neoglyphics began in 1995 with 5 people. It now employs about 70, including his father Gilbert Zoghlin, BS Journalism '61.

Neoglyphics also has a branch office in Champaign, with about a dozen employees—all of them either current UIUC students, former students, or former NCSA workers. The name of the game, Zoghlin says, is "hire, hire, hire," and the Champaign office is a great springboard for recruiting. If he can get people aboard as early as the sophomore year, Zoghlin feels he has a good shot at not only hiring them full time, but also having them ready to hit the ground running by the time they graduate. Current CS student Nathan Schwenk, who originally joined the company as a work-study student, heads the Champaign office.

Zoghlin cut his computing teeth as a child on a terminal and a 300-baud modem which his father used for his insurance business. When the family got one of the original Apples, "That was it," he said, "I was a lost soul." Alex began his professional career by writing billing software for law firms. He described his high school experience as similar to what some computer science majors go through in college: he rarely went to



Alex Zoghlin

class, he was always on the computer, and his grades suffered terribly—so terribly that college was probably not an option. Instead, he joined the navy for four years as a cryptotechnologist in the submarine force.

After four years of military service, Zoghlin applied to Illinois with confidence in his computer science abilities, so instead of majoring in CS, Zoghlin opted to study business. "What I've noticed in large businesses," he lamented, "is the glass wall between the CS chain and management. It's very difficult to cross over—for CS people to make it on the business side. I think it's a perception issue. Somehow, someone with an Econ major can become CIO, but someone with a CS major can't. It makes no sense. It will change as computer technology becomes much more of a strategic asset for a lot of these large companies. They're realizing that a CFO, a CIO, or a CEO who is well-grounded in technology is a huge asset to the company. So it's changing, but in a lot of these older companies, there's still a wall between technology and business, and it's a real pain."

As a UI student, Zoghlin held various programming jobs with the colleges of LAS and Agriculture. At night, he was a bouncer, first at Kam's, then at Joe's Brewery. "I got no respect no matter what I did," Zoghlin recalled. "During the day I got, 'Oh he's just some meathead bouncer who doesn't know anything.' And then at night, 'Oh he's just a computer geek.'" Zoghlin eventually got a job at NCSA and did outside consulting for Netscape. "Netscape got a lot of big companies that wanted to do more than static information on the Internet," Zoghlin explained, "and me and a couple of other people were the only ones they knew who could do it at the time. I

realized that this was an actual business. Netscape wanted to sell browsers and servers, and they would recommend me or other people to do the Web development work for client companies. I got so much business, I decided to quit school and make a go of it."

To start the company, Zoghlin put a help wanted note for CGI programmers in the newsgroup uiuc.cs.jobs and got about 20 responses. Like a contest, he gave each applicant the same thing to program and looked at what each came up with. "That's how I found Nathan. He was the only guy who was smart enough to find code out there, hack it together a little, and finish it. Everybody else did it all from scratch. So that's how Nathan got the job, and it took off from there."

The name Neoglyphics, which means "new writing," was the result of an all-nighter and a mutual agreement with a small graphic art supply store in Wisconsin with the same name. The idea was to build on-line commerce systems. "Back then," explained Zoghlin, "we went to Sears and said, 'Look what we can do with on-line commerce.' And they said, 'We don't have a budget for that, come back next year.' Well, you can't start a company that way, so I said, 'What are you budgeted for?' They said, 'Human resources, sales automation, inventory control. . . .' So we told them how they could use on-line commerce technology to save money in those areas, and that's what we did."

At the beginning, Neoglyphics' primary competitors were other small Web development companies, many of which are no longer around. Today, they compete with giants Andersen Consulting, IBM-ISSC, EDS, and Microsoft. In 1995, Neoglyphics did "okay," losing about \$100K. In 1996, its first full year, it did 30 times more in revenue than in 1995. And in the first quarter of 1997, it has booked more business than all of the previous years. The market is booming. So when is Neoglyphics going public? Not any time soon. "Our company is really strange because we're still private, we're not venture capital intensive, and we have no real plans to go public for a while," said Zoghlin. "Things are going very well. My concern is that if you look at all these companies, right after they went public they took a huge dive. Shareholders have massive expectations of you. We're investing in long-term stuff. We're doing things like huge multisystem integration jobs that are going to take a while to get the kinks out. I don't want the market breathing down on our people. If that happens, no matter how well we're doing, it just makes people feel bad. If we did need the money, it would be for acquisition. You'd need to grow very quickly." Zoghlin's father, Gil Zoghlin, author of the book *From Executive to Entrepreneur: Making the Transition* (Amacom, 1991), is the company's CFO.

Neoglyphics currently builds very large applications for customers. It provided the infrastructure Ameritech

needed to become an ISP, it established *Playboy's* online service infrastructure, and did the infrastructure for State Farm's new claims system. "We use C++, Java, and user interface pieces, and we integrate them into existing systems to give a big return on investment," Alex explained. "For instance, for *The Chicago Sun-Times*, we built a system that automatically offloads from the mainframe and creates an entire Web site automatically, which means there are only two people running the whole system. *The Chicago Tribune* has about 70 people doing the same thing, all by hand." Now that it has accumulated a lot of reusable code, Neoglyphics is able to take on larger projects with fewer people. Other clients include Allstate, Citibank, and Caterpillar.

Zoghlin says he eventually plans to return to school to finish his degree, but right now, he's enjoying his work in spite of a grueling amount of travel. "We're using technology that's never been tested before, and we're making things up as we go along, which makes it very fun, I think, for employees. It's also what keeps us ahead of the game." ■

Recruit CS grads

with a placement ad in this newsletter. Your company can sponsor an issue of this newsletter with a placement ad that will reach an elite audience of some 4,700 alumni and 1,200 current students of the Department of Computer Science. Call 217-333-1621 or email tolliver@cs.uiuc.edu.

PLATO people: Spruce up your wardrobe!

Did you miss the PLATO reunion during Cyberfest last spring? Then you missed the first opportunity to buy some great t-shirts. Luckily, they're still available in two stunning designs. One features an incredibly life-like—and almost actual size—rendering of a PLATO IV terminal, the other features those promising words "Press NEXT to begin." Not only are these shirts beautifully done, they are also quite the bargain. You can see and order them on the Web. They make great gifts!

<http://www.suba.com/~pete/tshirts.htm>

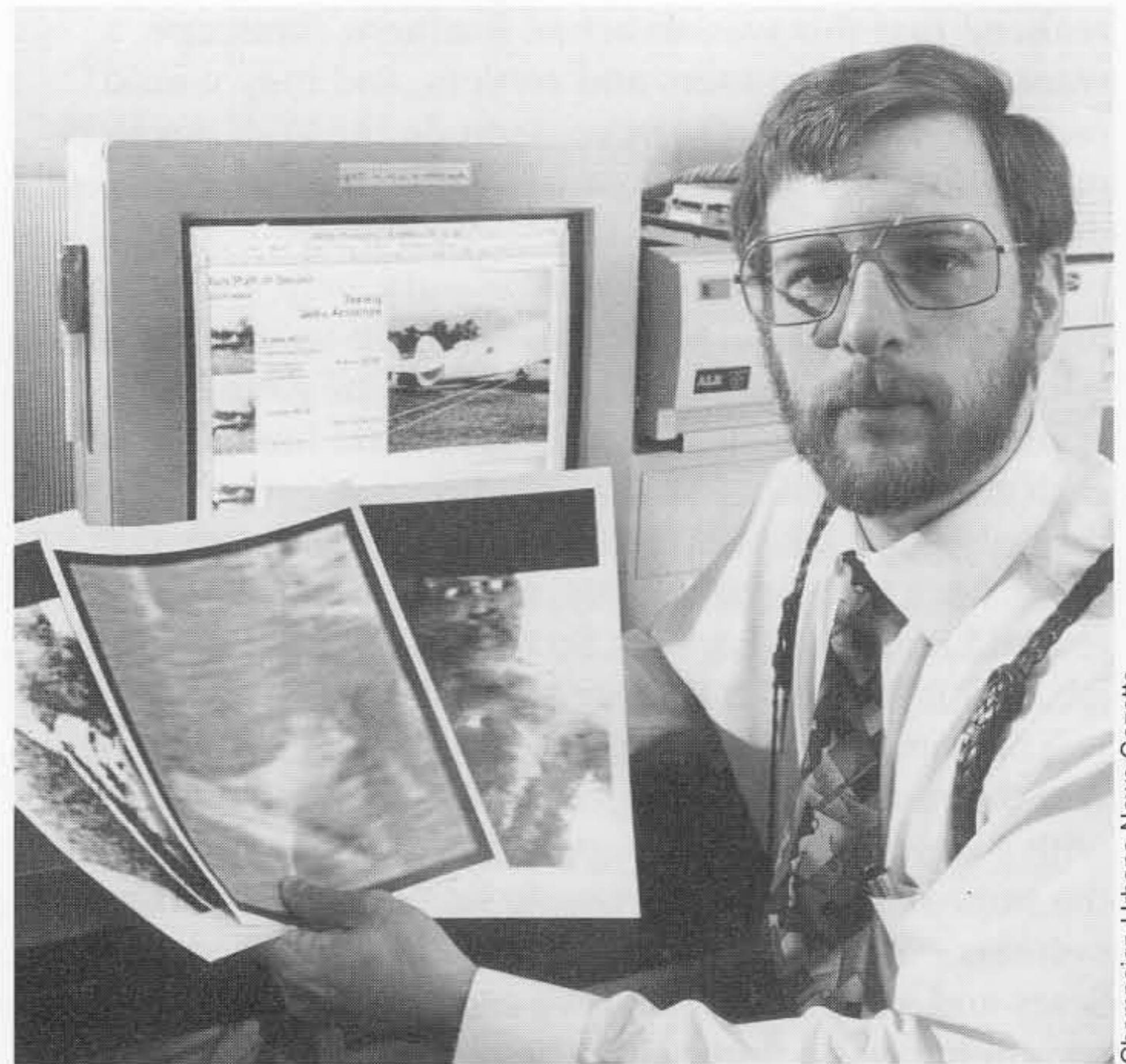
Jeff Glickman investigates Bigfoot

Jeff Glickman, BS'82 and a native of Roslyn Heights, Long Island, came to UIUC after visiting the campus and meeting Professor Ted Poppelbaum and members of his research group. Having programmed and even built little computers since he was six years old, Glickman arrived in 1977 with a Westinghouse Talent Search Award. As a freshman, he started doing research with Poppelbaum, first in robotics and later in pattern recognition and image processing. After earning his BS, Glickman went on to graduate school, remaining in Poppelbaum's group. He worked on getting a new CS computing facility equipped with nine VAX machines running Berkeley UNIX 4.1. This facility was to become CRL, the department's Computing Research Laboratory.

During graduate school, Glickman teamed up with his roommate Ken Taylor, BS'81, and started a business. A friend of Taylor's wanted them to build a little expert system calculator that could be used to track football statistics. The hand-held device involved custom hardware and software and despite their having zero knowledge about the game of football, they pulled it off. The product was built as a prototype called Basic Stats, and their Champaign-based company was Advanced Analytics Corp. In the 1980s, still working with Taylor, Glickman developed a fingerprint scanner, using some of the knowledge he gained working on image processing in the department. In 1986, Glickman started his private consulting firm, Glickman Associates, which provides technology management consulting services and contract hardware and software development.

In 1993, Glickman was asked by a friend to analyze some crime video after the FBI had given up on it. Glickman was able to extract a good enough image, using algorithms he had developed, to put the criminal behind bars. This work led to the formation of another company, Photek, specializing in forensic imaging, the analysis of photographic evidence for objective data. This led to two very interesting projects.

Glickman was contacted in 1993 by the North American Scientist Institute, which is investigating Bigfoot. They wanted Glickman to examine archival imagery and photographs to see if there was anything in the photography that could prove the film was a fake. Under study is a 1967, 16-mm film shot by Roger Patterson and Bob Gimlin in the Bluff Creek area in Northern California. By analyzing the many different simultaneous dimension of attributes present in the film, including stature, mass, stride length, foot size and flexion, and moving muscles, coupled with the definitive lack of seams and interfaces normally observed in analyses of humans dressed up in



Champaign-Urbana News Gazette

Jeff Glickman with some of the Earhart photographs.

suits, Glickman was able to extract some objective data, including the subject's height as well as the angular motion and acceleration of the knee. "There are biological parameters for what a human can and cannot do within these various locomotor parameters," explained Glickman. "Analysis may demonstrate that the subject's activity excludes the possibility that it's a human in a suit."

Another ongoing project, with the International Group for Historic Aircraft Recovery, examines aspects of Amelia Earhart's disappearance. Jeff used image enhancement and processing to analyze film footage of the take-off on a grass runway of her ill-fated last flight from Lae, New Guinea. His most important finding so far, highlighted recently in an Earhart special on the Discovery Channel, seems to prove why her plane went down. The loading manifest showed Earhart's plane was 50 percent overloaded with fuel, which led to the plane's dragging on the runway. During take-off, one of three antennas was ripped off the belly of the plane. Three radio antennas were crucial for navigation: one for receiving, one for transmitting, and one for radio bearing. With the receiving antenna gone, she couldn't hear instructions for radio navigation data, which then led to her inability to navigate successfully into Howland Island.

Glickman is a Computer Science Alumni Association board member and lives in Hood River, Oregon, where he enjoys the outdoors as much as he can. ■

<http://members.aol.com/gaicorp>
<http://members.aol.com/photek6>

Scott Corley: a High Voltage guy

Scott Corley, BS'92, is vice president of software development at High Voltage Software, a computer game development company that made its mark with NCAA Final Four Basketball, a Playstation, and Windows 95 hit. The company has the distinction of being chosen by the Chicago Bulls to write their opening graphics sequence and by LEGO to develop that company's first self-published LEGO licensed computer game.

Scott Corley comes from a long line of Illinois alums, from both sides of his family, dating back to his great-grandfather, John Hoblit, who graduated with an engineering degree in 1894. His grandmother, mother, father, uncle, sister, and brother are all alums. "But really," said Corley, "there wasn't any pressure for me to go to UI. I went because it was a good engineering school."

Corley's first encounter with computers was in sixth grade, with his Glenview school's Apple II. His older brother taught him how to program in Basic and loaned him Space Invaders on disk. Shortly thereafter, Scott began the process of trying to persuade his parents to buy him a computer of his own. The fact that his father W. Gene Corley, BS'58, MS'60, PhD'61, worked with one of the ILLIAC computers while he was a civil engineering student at UI may have helped his case. Corley got an Apple IIe by the end of junior high. Before that, however, his parents had brought them "probably the most obscure home video game console ever," said Corley. It was a Bally Astrocade, and there were only about fifteen games ever made for it. "One of the key things it had, which was unique at the time," noted Corley, "was a Basic programming cartridge, with a cassette tape interface. We thought this was great! Games cost about \$30, which was a lot for a kid, so our idea was to learn to program the thing and write our own games." (Years later, during a Playstation conference, Corley met another game developer from Midway who had also learned to program on the Astrocade.)

A turning point for Corley came in 1984, while he was a freshman in high school. "I was a closet computer geek," he admitted. "None of my friends had computers." Then a teammate on Corley's swim team mentioned that he had a modem. This friend introduced Corley to the on-line world of computer bulletin boards. A few months later, Corley's parents were installing a separate phone line for his own modem, and for four years, Corley ran small bulletin boards out of his basement. Interacting on-line among people with "almost godlike programming skills" inspired him to work on becoming a better programmer.

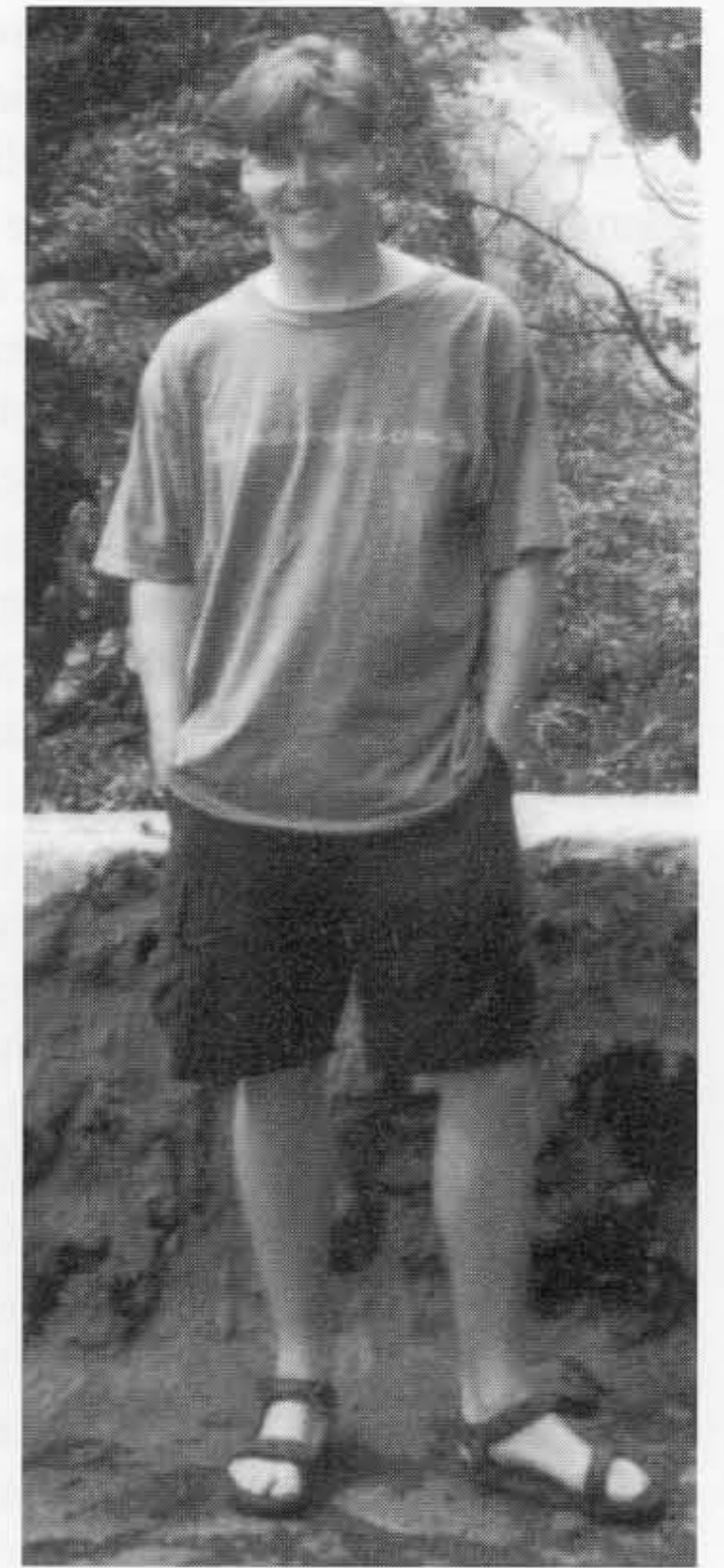
Although he started at UIUC as a civil engineering student and claimed that CS 101 (Fortran for non-CS majors) was one of the hardest classes he ever took, he

switched to CS, and enjoyed both the curriculum and college life in general (he was a member of the Beta Theta Pi fraternity).

When Corley graduated in 1992 he went to work for U.S. Robotics in Skokie, Ill., fifteen minutes from his parents' house, back when the company employed only about 400 people. "It was a great place to work," he recalled. "I was doing software for their FAX application that was packed in with the modems. I also worked on their Modem Sharing Kit, where you had one modem on your LAN, and anyone on the LAN could use it." More and more, Corley seemed to gravitate to the graphics side of the projects he worked on.

During his time at U.S. Robotics and in college, Corley had written graphics demos. "Those were the cool things to write back then, and it still is. It's a simple way to show off all your talents." He also wrote some games that he made available over the Internet for free. He is amused to see that one he did on the Apple IIgs is still available on the Internet for Mac users with Apple IIgs emulators.

Through the electronic bulletin board scene, Corley met Kerry Ganofsky, a game developer who had some connections in the computer game industry and knew a little about developing for the Super Nintendo and Sega Genesis systems. Ganofsky tried to talk Corley into forming a company, but Corley was reluctant to make the plunge at the time, especially when U.S. Robotics was doing so well. So Ganofsky started the company, High Voltage Software, without him. When the company landed a contract to write a Super Nintendo game, Corley felt that it was worth taking a chance. Their first product was a golf game for the Super Nintendo. "We were young and full of ambition, but not necessarily full of discipline," he recalled. "I had a pretty good idea that there was a right way to go about working on a project, and I was humble enough to realize it would probably be a few years before we figured out how to do this thing



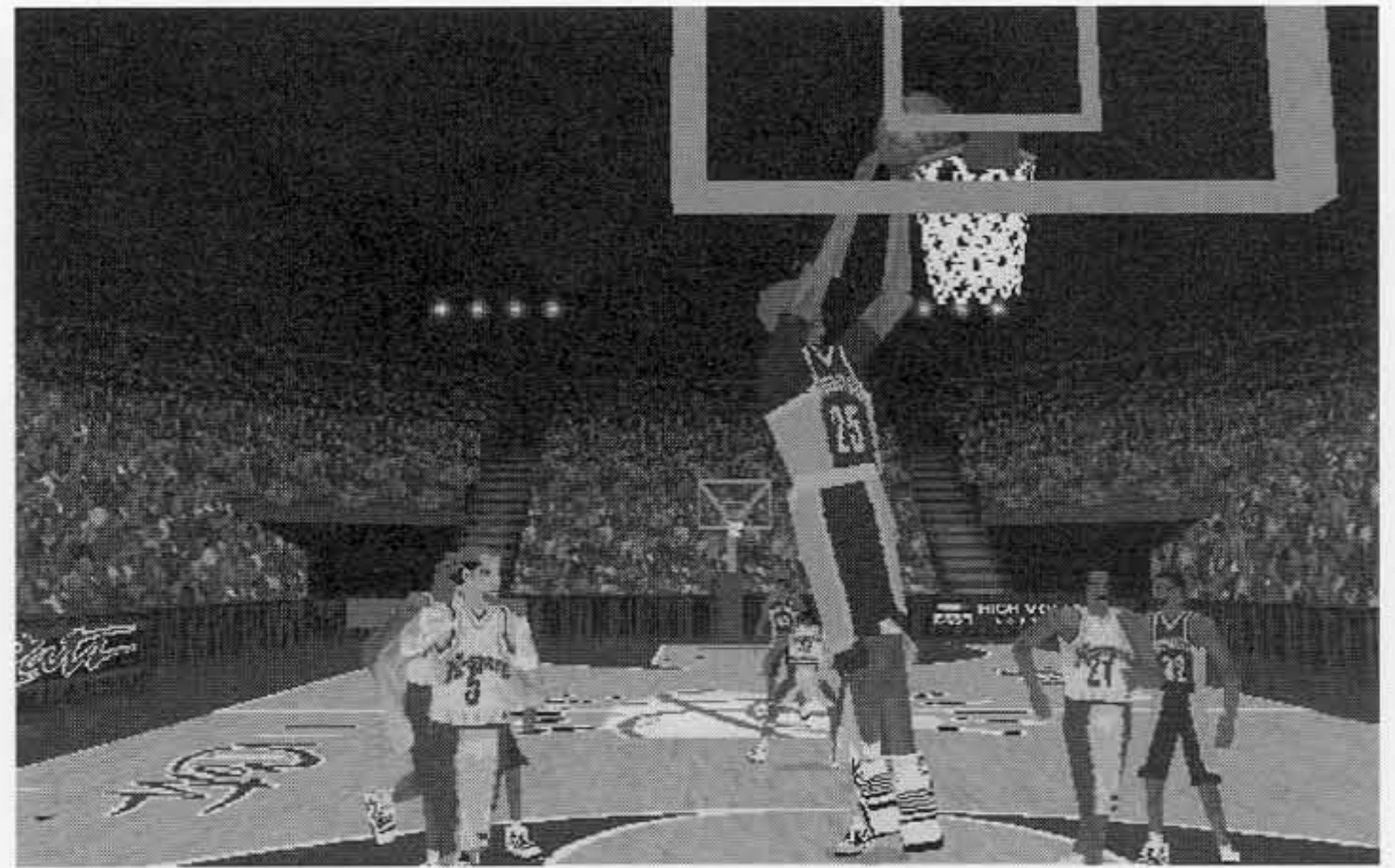
Scott Corley

right. So there were a lot of long hours—the typical programming story—people working overnight, drinking a lot of Mountain Dew, doing whatever it takes to get something done.” There were only four developers at the beginning of High Voltage Software. Due to money problems, however, the publisher abandoned the golf game. Luckily, High Voltage had been building relationships with other companies, and they were offered another project for Sega Gamegear.

But they were about to get a big break. “We were new, we had very little experience, and it was the end of the Super Nintendo and Sega Genesis years,” said Corley. “Then Atari, which had been hanging on since the 1980s, came in with a new game system, called the Atari Jaguar, that was going to rock the gaming world, and they were looking for game developers. So we hooked up with them and became one of their best developers. Major publishers and developers pretty much ignored Atari, so this was a great chance for us to get in there and prove ourselves.” High Voltage developed four games for the platform: a pinball simulation called Ruiner Pinball, which Corley single-handedly programmed; White Men Can’t Jump, a 2-on-2 basketball game; a port of NBA Jam (a Midway title); and VidGrid, a “bizarre” CD rock video game. Although working with Atari was a great experience for High Voltage, poor marketing killed the Jaguar.

Happier days were right around the corner as the Sony Playstation, Nintendo 64, and Windows 95 platforms came out. “We were in a great position for them because they all required knowledge of 3D graphics. The math and programming was more intense, and we fit right in. We had been hiring BS and MS degree people who were into games but were also well educated,” Corley said, contrasting these people with some of the earlier developers who had come from the hacker culture (the 17-year-old right out of high school). The first game High Voltage developed for the Playstation was Tempest X. This game was a 1990s version of the late-1970s game Tempest, a shoot-em-up game given new life with exciting special effects, lighting, and music. They had proved their abilities on the Playstation, solidified their relationship with one of their first publishers (Interplay), and things exploded from there.

Having produced several sports games before, High Voltage was poised to write NCAA Final Four Basketball, the company’s most successful title so far. It took a little more than a year to write, and it shipped last March for the Playstation and Windows 95. Corley and colleague Dwight Luetscher took a novel approach to writing the game: they wrote it in C++ (and some assembler). “It was a tough decision whether to write it in C or C++,” said Corley. “We were both comfortable with C, but we were looking toward the future. We spent quite a bit of time experimenting; compiling example code and looking at the assembler output and going through all the myths and fears about C++. Eventually we came to the conclu-



Screen shot of NCAA Final Four '97

sion that C++ was the way to go, that it would have great payoffs later in terms of the way we designed the software and its scalability.” It worked out so well, in fact, that they are programming all their games in C++.

In four short years, High Voltage has expanded several times and recently moved to a 22,500-square-foot facility in Hoffman Estates, Ill. It went from 4 to 15 developers, and the art staff grew as well. The total of 50 employees are hard at work on 3 new games for Interplay, Microsoft, and LEGO (as in the plastic brick company). Corley has moved toward the management side of the company. “We are conscious about growing too quickly without the necessary infrastructure to support the growth, so we’re constantly turning things down. There is a lot of computer science behind our philosophy and the way we do things here.” It’s Corley’s job as vice president of software development to guide the various projects along and to keep things scientifically sound.

If you haven’t seen a High Voltage game, but you watch the Chicago Bulls on TV, you may have seen some of the company’s work. High Voltage split off a special animation department to handle the full motion video part of its games. Because the company has its own skybox in the United Center, Corley and his colleagues frequently enjoy attending Bulls games. One thing they noted was how dull the 3D animated video of the bull running through the streets of Chicago was getting. Why don’t we redo the video for them, they wondered. So they did, and now what you see is a whole herd of bulls cruising through Chicago’s streets, and High Voltage now has a two-year contract with the Bulls to update that video. “It’s great to have the Bulls video publicity because our game development cycles are so long,” Corley said. “Now we have something to talk about in the meantime.” And so do we!

Corley lives in Chicago with his wife, Melissa, a consultant at CNA. He was on campus in November to talk to ACM students about his work. ■

<http://www.high-voltage.com>

ACM hosts third annual fall conference

The Third Annual Midwestern Reflections | Projections Computing Conference was held October 17–19 in DCL. This conference was hosted by our ACM student chapter and attended by more than 300 students from a dozen schools throughout the midwest. Steve Dorner, BS'83, creator of the Eudora email program, was the keynote speaker. There were a variety of technical workshops and presentations, including a talk on "Trends in Processors and Memory Integration," given by Professor Josep Torrellas. There was also a programming contest, called MechMania, and a job fair. Many alumni returned to staff some of the company booths as well as attend the conference. The job fair, held on DCL's first floor, attracted 34 companies looking to hire CS and ECE grads.

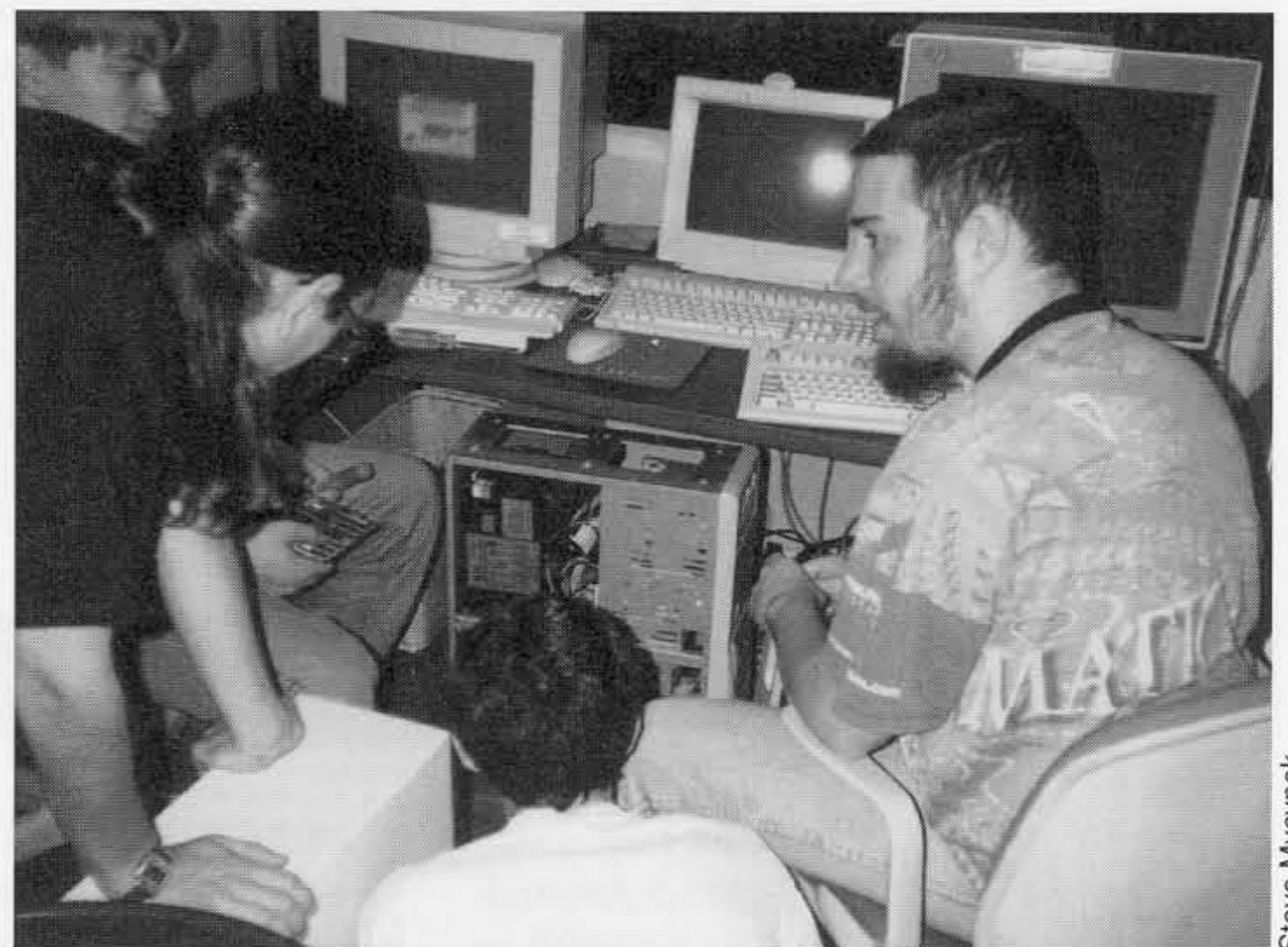
"The conference was awesome," said former ACM chair Dave Morgan, who originated the conference in 1995. "It was certainly different to be back on the presentation side of the conference as opposed to the organization side. Still hard work, but different." Morgan, BS CompE'97, is a graphics hardware engineer with Silicon Graphics and led workshops on OpenGL programming. He also staffed SGI's recruiting booth.

Said this year's conference chair Christy Schumacher, senior in CS and ACM treasurer, "The conference was a great chance for us to interact with companies and alums and to meet lots of interesting people. Learning what students are doing at other schools gave us lots of new ideas for future projects."

ACM's next big event will be December's semiannual Sounds & Visions concert, a presentation of original musical compositions by members of SIGMusic accompa-

nied by eye-popping computer graphics by members of SIGGraph. These SIGs (special interest groups) are just two of ACM's current 14. They and other SIGs are already gearing up for Engineering Open House, held every March on the engineering campus. (Corporate folks take note: they are always looking for sponsors for their various projects.) A few projects underway: SigOps members are writing their own operating systems, and SigArt is building a robot that will map DCL. ■

<http://www.acm.uiuc.edu>



Erik Gilling, sophomore in CS and ACM's cluster administrator, set up the all the networking for the conference.

Steve Mycynek

Fall 1997 marks the start of new CS curriculum

All fall 1997 freshmen and later students are now following new graduation requirements. The big change: no longer will CS majors in engineering have to take two semesters of chemistry. Chem 102 is no longer required; differential equations, however, is (Math 285 or 341).

Students are required to take a total of 128 hours instead of 122, thereby allowing time for the Senior Project or Senior Thesis. The same number of 300-level electives are required (six courses), but the distribution is different. Instead of having specific courses required in various specified areas, virtually any 300-level course may be taken.

Another change in 300-level courses is that both the computer languages course (CS 321, formerly 325) and the operating systems course (CS 323) are required. Before, students could take either one. The computer languages course has changed as well; it's about half languages and half compilers.

Says Professor George Friedman, director of undergraduate programs, "The new curriculum increases flexibility, allows for more specialization, and has a place for the Senior Project or Senior Thesis. We think all of these are important, positive developments." ■

Class project become Vmail

Two of Professor Klara Nahrstedt's graduate students, Chris Hess and Dan Lin, have developed a multimedia mail system. The software stemmed from a project begun in spring 1997 in Nahrstedt's multimedia systems class, CS 397, and the students continued this work over the summer. The result is Vmail, a fully integrated multimedia e-mail system that combines audio, video, and text into a single message that is then sent to the recipient. With the Vmail system, a user may choose to send a message incorporating any combination of the three media forms.

The Vmail system is standards compliant, which means that it uses SMTP to send the text, sends the video in MPEG or MJPEG form, and sends the audio in μ law encoded form. The video file is sent to a special Vmail server at the receiving

site. The audio file, however, may be sent to the Vmail server or through SMTP as a MIME attachment to the text message. This makes Vmail flexible, transparent, and easy to use. Fully supported Vmail sites will have both the server and mail browser. Only Vmail-server-equipped sites are able to receive video enhanced email messages. However, any site with the Vmail browser can send and receive text and audio messages.

In general, the server receives the video and audio portions of the Vmail message and stores them in a central area owned by the receiver. As the user checks his email with the Vmail browser, those selected messages that are multimedia enhanced automatically appear on the screen. If other text-based email programs (PINE, elm, Netscape Mail) are used, they will simply fail to

notice the existence of video and audio associated with the text email message.

Currently, Vmail runs on Solaris and HP-UX platforms. HP workstations that are equipped with Parallax Graphics' video cards can send MJPEG video messages. Sun workstations equipped with SunVideo can send MPEG video messages. The Vmail browser is equipped with a software MPEG decoder so that MPEG video messages may be viewed on any platform. ■

<http://www-courses.cs.uiuc.edu/~djlin>.

Not a member of the UI Alumni Association?
1-800-355-ALUM
alumni@uiuc.edu
<http://www.uiaa.org>

Department notes

Professor **Joseph Torrellas** has received an IBM Partnership Award. The award carries a gift of \$40,000 in cash. The purpose of the award is for Torrellas to collaborate with researchers at IBM laboratories to design a multiprocessor on a chip. Recent technology trends allow the integration of hundreds of millions of transistors on a chip. An on-chip multiprocessor is a good way to use all these transistors.

Professor **Caroline Hayes** and mechanical and industrial engineering professor Patricia Jones have been awarded a new grant for \$245,000 in the area of human-computer interaction for the Co-Raven project, Co-raven will be a decision support tool that assists teams in making collaborative decisions. The money for this project was jointly awarded by the Army Research Laboratory (ARL) and the Army Intelligence and Security

Command (INSCOM). The goal of the Co-Raven project is to demonstrate a collaborative, multimedia, intelligent support system for teams of military intelligence analysts.

Professor **Paul Saylor** was featured in the September, 1997, issue of NASA's *Insights: High Performance Computing and Communications*. The article highlights Saylor's work on simulating mergers of neutron stars using full relativistic calculation. This method is the only way to predict the gravitational wave signal and probe the possibility of black hole formation.

Zgrida Arbatsky, secretary and former supervisor of the computer science library, was honored with the 1997 Certificate of Merit Outstanding Staff Member Award from the Dads Association. One of her main achievements was to transform the computer science reading room into

a functional library accepted into the UI's main library system. She was also recognized for her friendliness and helpfulness to library patrons. After the CS library collection moved to the Grainger Library, Arbatsky has been a support staff member for several professors. She's been with the department since 1970.

Graduate student **Thomas Kwan** received an honorable mention in the international ACM/IBM Java'97 Programming Contest. He submitted a Java applet which implements the Hodgkin-Huxley Neuron Model that simulates the response of the squid giant axon to a step current injection. He originally did the work for a class project for Physiology 490. "What is exciting about this model," he said, "is that Hodgkin and Huxley won the 1963 Nobel prize in physiology or medicine for this landmark discovery!" <http://www.acm/org/jquest> ■

Classnotes

Ray Ozzie, BS'79, left Iris Associates this fall to form Rythmix, where he will design new products that complement Lotus Notes, which he created.

Christine Engels Taylor, BS'81, is working toward her master's in art education from the Art Institute of Chicago. She has previously worked at the Pentagon, NASA, Texas Instruments, and Wyle Laboratories. She now owns Artful Concepts, a computer graphics company in Costa Mesa, Calif., and teaches fine arts at Orange Coast College.

Ken Jenks, BS'85, MS Aero'88, works at NASA Johnson Space Center where he had held several positions including "Space Shuttle flight controller, bureaucrat, programmer, project manager, scientist, Webmaster, and roboticist." He is also editor-in-chief of *Mind's Eye Fiction*, a group that publishes professional short stories (heavy on the SF) on the Web. <http://tale.com>

Bill Schaeffer, MCS'85, has a CD of original piano music called *Piano Sole*. He works at Centropolis Effects

as a digital paint and roto artist. wmschaeffer@earthlink.net

Ron Brinkmann, BS'86, left Sony Imageworks to work part-time at Nothingreal and do free-lance work. This fall takes him to London, where he's consulting with the visual effects company The Mill. Ron still lives in Los Angeles.

Monica Fortner, MCS'87, and her husband, physics alum Brand, BS'77, MS'82, PhD'93, endowed an academic chair in theoretical astrophysics for \$1.25 million in November 1996. Monica worked as a PLATO programmer at the Computer-Based Education Research Laboratory (CERL) and now works at Fortner Research in Sterling, Va.

Tim Krauskopf, MS'87, was married in February 1997 to Mele Howland. One of the founders of Spyglass, Tim has returned to school to earn an MBA at Northwestern and manages the LAN for the Field Museum of Natural History in Chicago.

Taed Nelson, MCS'91, started a networking company with four other

people in 1997 called Vertical Networks in Sunnyvale, Calif. (www.getvertical.com). The company grew to 40 employees in only 6 months.

Jason Lowe, BS'94, was married to Brandi Hilton in June 1997. He is a software engineer at Motorola in Urbana.

Jason Killion, BS'95, was married to Shannon Sapp in August 1997 and works for Andersen Consulting in Chicago.

Daniel Perper, BS'95, was married to Daniell Pritzker, BS Psych'96, in July 1997. He is a trader at the Chicago Board of Trade for Swiss Bank.

Paul Rajlich, BS'95, was married to Cynthia Berry, BS Kines'96, in August 1997. He is now working on his PhD in the department.

Chris Trimble, BS'95, left Manhattan, where he worked as a technical director at Blue Sky Productions, for Palo Alto. He is now with Pacific Data Images.

Alumni gather *en masse* in Mass.



Maureen Phillips

Fontaine Richardson, Harlan Anderson, and Tim Halvorsen

Fontaine Richardson, PhD'68, Harlan Anderson, BS EngPhysics'51, MS Physics'52, and Tim Halvorsen, BS'77, enjoy a beautiful day at a gathering of engineering alumni at Richardson's Massachusetts home. Richardson was the department's first PhD and is president of Eastech Management Co, a VC firm. Anderson's Illinois days predate the CS department. He is co-founder of Digital Equipment Corp. and now general partner of Anderson Investment Company. Tim Halvorsen, who co-wrote Lotus Notes with CS alums Ray Ozzie and Len Kawell, is CTO of the company they co-founded, Iris Associates.

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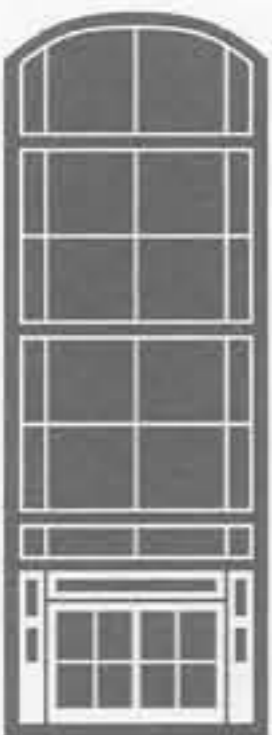
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