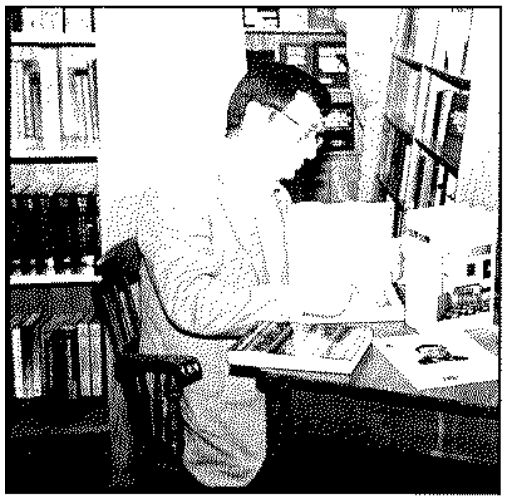
conduit!

Volume 3, Number 1 **Department of Computer Science** **Spring, 1994**
Brown University

VAN DAM RECEIVES KARLSTROM OUTSTANDING EDUCATOR AWARD



Andries van Dam

The ACM Karl V. Karlstrom Outstanding Educator Award is awarded annually to an outstanding educator in computer science. We are proud to announce that Andy van Dam of this department received this year's award. He is only its fifth recipient: past awardees are C. L. Liu, Gerald J. Sussman, David A. Patterson, and David Harel, a distinguished group indeed.

Andy's contributions to education in computer science are numerous. In his field of expertise, computer graphics, his 1982 *Fundamentals of Computer Graphics,* co-authored with Jim Foley, was the standard textbook for graphics courses—that is, until 1990, when its successor *Computer Graphics: Principles and Practice,* co-authored with Jim Foley, John Hughes of this department, and former Ph.D. student Steve Feiner, became the new standard text and reference book for the industry. With Sam Matsa of IBM, Andy co-founded in the late sixties ACM's SIGGRAPH (Special Interest Group in GRAPHics), a group that has grown to have more than 30,000 attendees at its yearly conference. Andy's early research into hypertext led to a text-editing system used in Brown's English department, among others, more than 20 years ago. Further research in the mid-'80s at Brown's Institute for Research in Information and Scholarship, which Andy co-founded, led to hypermedia materials for multiple courses across the Brown campus. In 1991, Andy received the SIGGRAPH Steven A. Coons Award for his "pursuit of excellence in the field of computer graphics, his contributions to computer graphics education, and related fields."

Andy has always taught the large introductory computer science course because, he says, "it provides the most reward. Here I can influence the most wildly and naively enthusiastic and malleable students." Andy's latest mission has been yet another reorganization of this course, CS15, to teach students object-oriented programming. This brand-new course takes the radical approach of teaching the ideas central to object-oriented programming within the first month of the course. Armed with powerful tools such as inheritance and polymorphism, students learn software reuse early on, making extensive use of a user-interface class library even in the very first programming assignment. By the end of the course, students are building interactive 3D applications. So far as we know, no other first-semester course in the world takes such an aggressive approach to teaching object-oriented programming. The textbook being used for the course will be published next year by Addison-Wesley, and is co-

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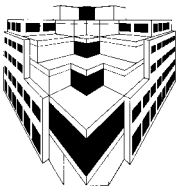


authored by former Sc.B. and now M.Sc. student and colleague David Niguidula, Andy and Ph.D. candidate Brook Conner.

A measure of Andy's influence as an educator in the broadest sense of the word is the exceptional success of the students, particularly undergraduates, whom Andy has taught throughout his career. More than a dozen of his former students now are engaged in university research and education, including four current chairs of top computer science departments and five NSF Presidential Young Investigator Awardees. Many more hold important positions in industry research and development.

A $5,000 prize for the Karlstrom Award was given by Prentice-Hall Publishing Company; the award was presented at the annual ACM Computer Science Conference this March.

PERSPECTIVES IN COMPUTER SCIENCE

Our lecture series "Perspectives in Computer Science,'' now in its second year, provides an introduction by Brown computer science faculty members to the broad area in which they work for the Brown community, alumni, and participants in the Industrial Partners Program. This year's lectures covered the following topics:

John Savage: The Role of Theory in Computer Science

"With concurrent programming techniques, one can combine the speed of asynchronous approaches with the simplicity of synchronous approaches"

Thomas Doeppner: Concurrent, Parallel, and Distributed Programming: How to Do Many Things at the Same Time

Roberto Tamassia: Computational Geometry: Beyond the Ruler and the Compass

Stanley Zdonik: The Role of Databases in Computer Science; or, Databases Are Not Just for Clerks

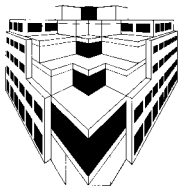
Paris Kanellakis: Computational Logic: From Mathematical Logic to Computer Science

THEORY

The talk on theoretical computer science pointed out that theoretical models describe not only what is computable but also how efficiently computational tasks can be done. It examined logic circuits, finite-state machines (FSMs), and random-access machine (RAMs). The specification of tasks by functions and their realization by algorithms was discussed. The theorem that every task computed by an FSM can also be computed by a circuit was proved and the relation between the FSM and the resulting circuit expressed as a computational inequality. When this theorem is specialized to the RAM, it becomes the inequality $C(f) \leq kST$, relating a function f computed by a RAM with storage S and time T for a small constant k, where $C(f)$ is the size of the smallest circuit for f. Algorithm analysis was illustrated by studying two sorting algorithms. Two other theoretical topics of an applied nature, VLSI integrated circuits and the pebbling game that models register allocation, were briefly examined.

CONCURRENT AND DISTRIBUTED SYSTEMS

Concurrency can be studied from both a theoretical and a practical viewpoint and is an increasingly useful concept in computer science. It is an abstraction of having many things in progress at once. With multiple processors, concurrent programs can become parallel programs, with the potential for faster execution. But even with only a single processor, concurrent (or multithreaded) programming techniques turn out to be amazingly useful. Many uses of graphical user interfaces involve a fair amount of concurrency: typed input is processed while garbage collection is taking place; mouse clicks are handled while a file is being checkpointed. Such situations are difficult to deal with using standard single-threaded programming techniques. Single-threaded programs that involve a significant amount of both I/O and computation either perform I/O synchronously and are slow and simple, or perform I/O asynchronously and are complex and error-prone. However, with concurrent programming techniques, one can combine the speed of asynchronous approaches with the

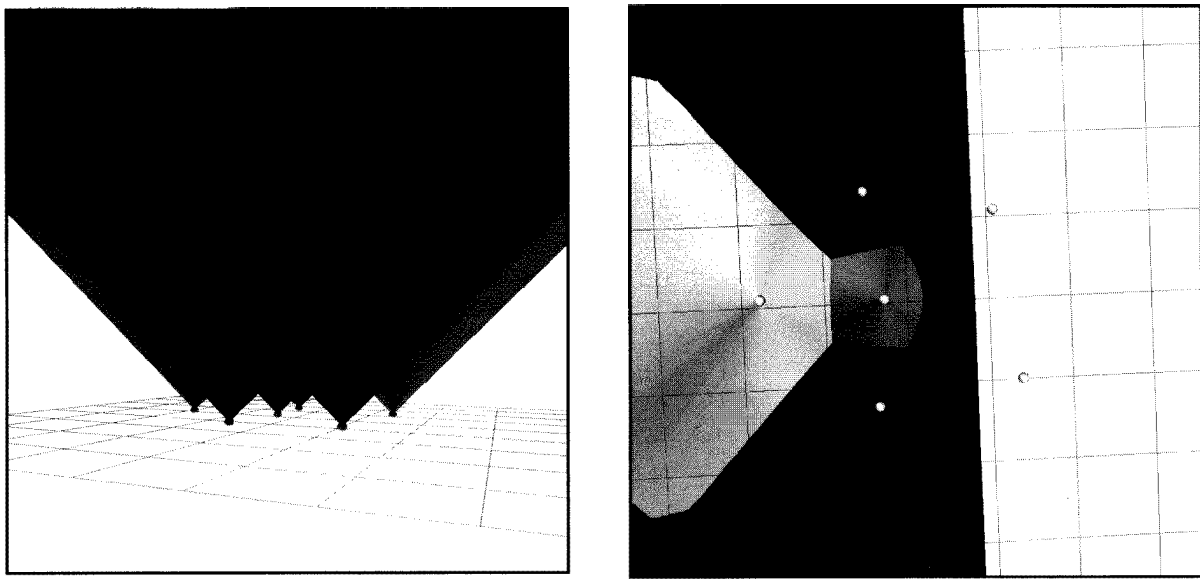


simplicity of synchronous approaches.

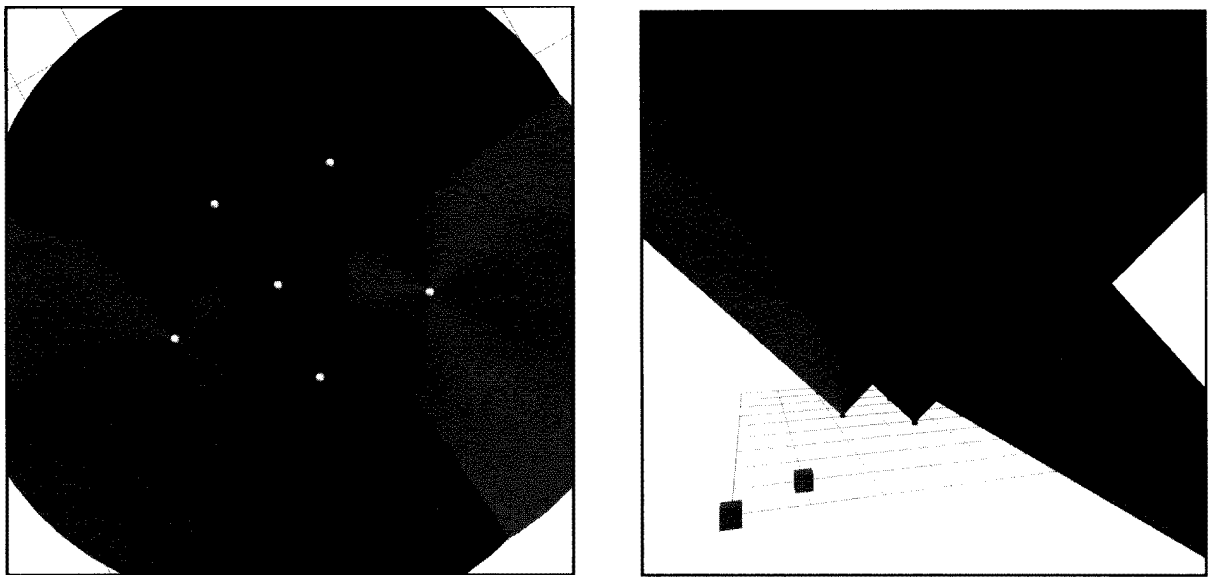
The talk on concurrency motivated these and other uses for concurrency and described work at Brown and elsewhere on the support of multithreaded programming—adapting existing programming languages for the support of concurrency—on both uniprocessor and multiprocessor computers. Finally, the extension of such concurrent programming techniques to support distributed computing was discussed.

COMPUTATIONAL GEOMETRY

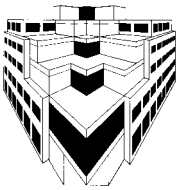
Geometric structures are the underlying model of several important applications, including VLSI layout, robotics, graphics, and CAD/CAM. The field of computational geometry, which studies algorithms for geometric problems, is attracting increasing research interest and is currently one of the most active areas of investigation in theoretical computer science. This lecture gave an introduction to computa-



The Voronoi diagram of a set of sites in the plane can be obtained by means of the following 3D construction: 1) grow identical opaque cones upwards from all the sites; 2) look at the cones from below; what you see is the Voronoi diagram!



3) Now, slice the cones with a plane inclined at the same angle as the cones. An efficient algorithm for constructing the Voronoi diagram (due to S.Fortune) is based on the idea of "sweeping" the plane through the cones and looking at the scene from below; 4) The boundary of the sliced cones appears as a collection of parabolic arcs. As the plane sweeps through the cones, the points of intersection of the parabolic arcs draw the Voronoi diagram.



tional geometry and addressed some of its fundamental problems, such as convex hulls and Voronoi diagrams.

A historical perspective was given of computational notions in classic geometry, such as the minimum number of compass-and-ruler operations for a certain geometric construction. Next, the solution of geometric problems by computer was discussed; it was shown that clever algorithms are needed to solve problems involving millions of geometric objects (arising, e.g., in integrated circuit layout or in aircraft manufacture), even with supercomputers. Spectacular color demos on the construction of Voronoi diagrams, developed by Brown's John Bazik and Scott Snibbe, and an excerpt from the video review of the 1992 Computational Geometry conference concluded the lecture.

"After almost half a century of development, computer science in its own turn is now influencing mathematical logic"

DATABASES

The foundational issues of databases that form the basis for the field of database management were examined, focusing on how the database designer's approach to these issues relates to approaches to similar issues from other areas of computer science. This talk described the major contributions of object-oriented databases (OODBs) and the research challenges that must be addressed before they can be used in the future, drawing examples from applications that will be facilitated by the existence of the 'information superhighway.'

LOGIC IN COMPUTER SCIENCE

Logic has been an important theme of 20th-century mathematics that grew out of the formal study of reasoning and the foundations of mathematics. The discovery and study of computability, Godel's completeness and incompleteness theorems, and set theory are among the major accomplishments of mathematical logic. It is not surprising that such fundamental scientific contributions have had a major impact on the more recent (and applied) field of computer science. Turing's ideas on universal computing machines influenced the design of the first electronic computers. The theory of algorithms and computational complexity has been built on the logical theory of computability. Programming language design, semantics, and implementation have found inspiration in logical formalisms, such as the lambda calculus and the first-order predicate calculus. The techniques of logic have been used to verify both hardware and software.

After almost half a century of development, computer science in its own turn is now influencing mathematical logic. Problems of computational complexity (such as P vs. NP) have been identified as central to the understanding of efficient reasoning, and modeling concurrent computations and common-sense reasoning have become important logical challenges. Computer scientists have directly contributed to new analytical areas of logic such as finite model theory and constructive type theory. This talk gave an informal exposition of some of the links between the two fields and of their emerging intersection, called computational logic.

THE 12TH IPP SYMPOSIUM

On October 15, 1993, John Hughes hosted the 12th Industrial Partners Program Symposium on "Frontiers in Visualization." The premise was that, while scientific visualization is becoming a well-established discipline within computer science, numerous other kinds of visualization, especially non-scientific data visualization (e.g., the "desktop" for visualizing one's workspace and various program-visualization methods for viewing programs that are inherently multiply ordered) are growing up in the shadows but will eventually prove to be more significant. The symposium certainly lent credence to this view.

Steve Reiss of Brown began by describing the architecture of a multimedia information viewer. His proposed system has, as its primary intent, software understanding and organization, but he stressed the applicability of the design to other areas of information presentation.

Andy van Dam and Brook Conner presented

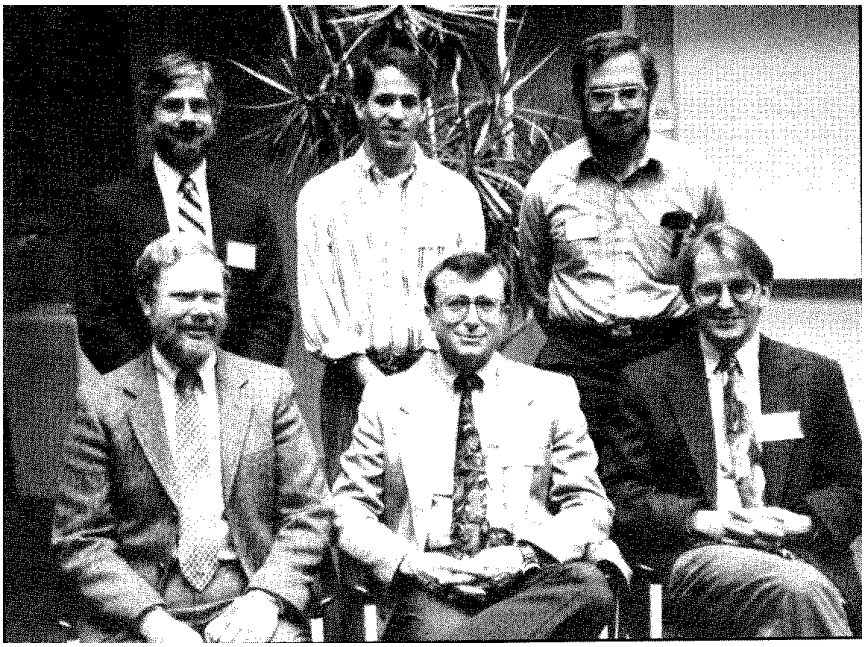
their ideas on the interaction model for visualization in virtual environments, where low latency requirements and the possibility of multiple participants substantially complicates the design of a program and the standard event-loop design proves inadequate.

The first talk after lunch was by Ben Bedersen of our IPP partner Bellcore, who spoke on PA3D, a zoomable surface for data presentation. The PAD is infinite in extent and allows data entry or presentation at any level of detail. This allows interesting code views (in which the contents of routines are displayed in a very small size) and other kinds of information presentation. It also presents navigational challenges, and Ben described some logarithmic zoom methods for attacking these.

Following this, George Robertson of Xerox PARC presented work at Xerox on information visualization, including Rooms, Cone Trees, and the Perspective Wall, and explained how they fit into a general approach to information visualization. He also discussed some applications of information visualization to large-scale problems and speculated about future directions for the work.

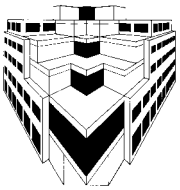
And in the last talk of the day, Steve Feiner, of Columbia University, described a variety of visualization projects: the *n*-Vision visualization system and its application to viewing high-dimensional financial data; a project in which a small see-through head-mounted display presents information in a small portion of a large virtual information surround, allowing an enormous "desktop;" and an augmented-reality project in which knowledge-based graphics is used to highlight features of real-world objects to aid in a maintenance and repair task.

Several attendees noted a remarkable commonality among the approaches taken by the various researchers (one that was not apparent to me, as organizer, when I invited the speakers). It was clear, from the talks themselves and the discussions that ensued, that this is a lively and expanding area.



Symposium speakers: back row, l to r, Steve Feiner, Ben Bedersen, Steve Reiss; front row, l to r, George Robertson, Andy van Dam, Brook Conner

The administrative staff behind the scenes of each symposium: top row, l to r, Susan Platt, Dawn Nicholaus, Suzi Howe, Lori Agresti, Jennet Kirschenbaum; bottom row, l to r, Mary Andrade, Patti Courtemanche, Michele Jamieson, Katrina Avery



Eugene Charniak. Eugene gave an invited talk at CMU and was on the program committee for the annual conference of the American Association for Artificial Intelligence, the main AI group in the U.S.

Paris Kanellakis. Paris has been invited to speak at three computer science conferences: the International Symposium on Theoretical Aspects of Computer Software (TACS, April '94) in Sendai, Japan; the International Colloquium on Automata, Languages and Programming (ICALP, July '94) in Jerusalem, Israel; and the International Conference on Concurrency Theory (CONCUR, August '94) in Uppsala, Sweden.

Franco Preparata. Franco was the General Chair of the IEEE Symposium on Parallel and Distributed Computing held in Dallas in December 1993. At that meeting Franco organized and moderated a panel discussion on the interaction of theory and systems in parallel computing. He presented colloquia at the universities of Massachusetts, Texas, and Milan.

Roberto Tamassia. In April, Roberto will be an invited speaker at the 892nd meeting of the American Mathematical Society, in New York. He will travel widely this summer being an invited speaker at the sixth Australasian Workshop on Combinatorial Algorithms, in Darwin, Australia, in June and the Workshop on Orders, Algorithms and Applications, in Lyon, in July. He is also on the program committees of two conferences on theoretical computer science.

Andries van Dam. Andy was an invited lecturer at four conferences in the U.S., and keynote speaker at two—the IEEE Symposium on Virtual Reality, in San Jose, and the European Network Users Forum, in London. In March he was elected a Fellow of the IEEE and was one of the initial inductees as an ACM Fellow.

Pascal Van Hentenryck. Pascal is on junior sabbatical at the University of Marseille this semester. He is program chair of ICLP '94 and sits on five program committees. He will be a speaker at the 22nd Spring School on Theoretical Computer Science to be held in Chatillon, Cote d'Or. Constraints are the special topic this year. He will give various invited talks in France at the University of Bordeaux and at INRIA.

Peter Wegner. In his capacity as an ACM lecturer, Peter lectured on the subject "What Comes After Object-Oriented Programming" in Arizona, Quebec, and Puerto Rico.

ALUMNI EMAIL TO THE EDITOR

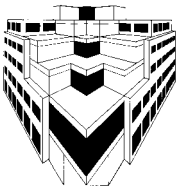
Keep it coming! sjh@cs.brown.edu

ED LAZOWSKA '72

I graduated from Brown in 1972 and received a Ph.D. from the University of Toronto in 1977. I've been at the University of Washington since that time, and became chair of the CS department this past summer. An interesting note is that four strong departments have former Andy undergraduates as chairs right now: me, Frank Tompa at Waterloo, Sedge at Princeton, and John Guttag (actually Associate Head for CS) at MIT. Also, there are four former Andy undergraduates on the faculty at Washington: me, John Zahorjan, David Notkin, and David Salesin.

THOR JOHNSON '75

I live in Rhode Island and work in Boston for Charles River Ventures, a venture capital company specializing in technology startups and



seeking early-stage companies for investment. Best of luck with *conduit!*, keep it coming!

crv!tjohnson@notework.com

JACK STANKOVIC '79

I was elected a Fellow of the IEEE this past year for research contributions in distributed and real-time computing. I was a graduate of Brown in 1970 (Sc.B. in EE), and then got my Ph.D. in CS with van Dam in '79. I have been a professor of CS at the University of Massachusetts at Amherst since I left Brown.

stankovic@ocean.cs.umass.edu

ERIC ALBERT '80

I am one of the three people in the United States who earn their living solely from constructing crosswords, and the only one that constructs those crosswords by computer. Thus, I owe my career to the Brown Computer Science Department. My work appears regularly in newspapers, including the *New York Times*, *Washington Post*, *New York Daily News*, *New York Newsday*, *Toronto Sun*, *Cleveland Plain Dealer*, and *Chicago Sun Times*, and I also contribute to all the top puzzle magazines. Recently I constructed crosswords which will appear on the back of Kellogg's Product 19 cereal boxes.

I use a computer system of my own design to assist me in all this crossword work. The system is written in C, works with a database of 750,000 words and phrases that I've compiled, and runs on a 33MHz 486 DX with 16M RAM. The system includes programs to place black squares in a blank grid, manage a clue database, generate PostScript camera-ready copy, and so forth. The core of the system is a program that, given a formula and a database of ranked entries, finds the best way (i.e., the way that maximizes the formula's value) to fill a crossword grid section. My system has been written up in *Omni*, *Crossword Magazine* (cover story), and *Games Magazine*, and in a recent survey was voted the best filler of crossword grids in the United States, beating out all human competitors.

Filling crossword grids by computer is a very challenging research problem. Matthew L. Ginsberg (ginsberg@cs.stanford.edu) has done some good work on quickly finding *a* way to fill a grid, but no one (other than I) seems to have done any work on finding the *best* way to do it. I am not satisfied with my approach, and would welcome any suggestions the Brown CS community can provide.

In the early '80s I designed and implemented a networked inventory control system for bookstores called WordStock. I believe that WordStock is now the best-selling such system in the world, being used by many of the largest bookstores, including all 1000 stores in the Barnes & Noble chain. An early (and current) WordStock customer is the Brown Bookstore.

mprimak@bbn.com (my wife's e-mail address)
14 Hancock Street Auburndale, MA 02166; (617) 969-8787

BOB PULLEY '80

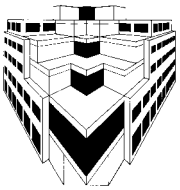
I am working on the Route 495 beltway in Massachusetts at Racal InterLan as Director of Engineering. I am still living in Barrington and manage to get up to the East Side a couple of times a year.

pulley@interlan.com

ORAN BODNER '81

I was at Brown for only one year during 1980-81. Let's see, who was there - pw, ec, avd, twd (I forget the others' logins). There was Dave Johnson, Mike Braca, Mark Post, Scott Smolka, Janet Incerpi, Lisa Rubin, Steve Feiner, Bill & Sue Smith, Peter Wegner, Tom Freeman, Sofia Pereda, Bill Weber, Doug Wong, Marc Brown, Mickey Delaware, Matt Kaplan, and others. I remember a Norman Meyrowitz (some people said I looked like him), but I don't think he was a graduate student at the time. I was one of the "foreigners" (from Israel). There was also Alessandro from Italy, Sofia (Argentina), and Zhu Hong (China). Oh, yes, and Graeme Hirst (from Australia). (Apologies to any others I may have missed.) Mary Agren was the receptionist, I think. It was a good year. We had a Vax, I think, and a couple of rooms with Zenith terminals. Rogue was the big game people played at the time. Zhu Hong didn't understand why we spent so many hours playing games, but then I taught him "snake," and he never looked back. He said I should visit him in Shanghai. I said "sure."

In the fall of '81 I left Brown, I got married to Ellen (who was studying at RPI), and we moved to New Jersey to work for Bell Labs. I worked in the UNIX development group with Bill Weber until I left in '85. (This group later became Unix Systems Labs, which I believe was recently acquired by Novell.) Anyway, my contribution to SVR4 was the "tput" command (which was fairly useful at the time when people still worked on CRT terminals).



In the spring of ’85 we took off a year to travel, and visited places like Barrow (Alaska), Hokkaido (Japan), Shanghai (yes, we did get to see Zhu Hong!), Hong Kong, Thailand, Australia, New Zealand, and then stopped in Israel to volunteer at a kibbutz for a couple of months. Four years and one baby later, we realized that our one-year leave of absence had probably expired at Bell and that milking cows, although valuable experience in its own right, would probably not apply in the UNIX world, so we decided to stay in Israel for the time being.

Israel has a fair number of R&D branches of US computer companies, such as IBM, CDC, Intel, Microsoft, DEC, and others. Ellen got a job at Intel, while I got one at a company called DAZIX; it was later acquired by Intergraph who dissolved the Israeli branch (I hate company take-overs), so I also joined Intel. Intel is one of those “open-space-policy” companies, where hundreds of employees sit in this humongous room, each in the semi-privacy of his/her little cubicle—not at all the kind of homey atmosphere I remember at Brown. But it’s okay.

We live now in the little town of Zichron Yaakov, about 20 miles south of Haifa. All four of us commute to the Haifa “Technology Center Park” every day, where Ellen works now at Fibronics, moi at Intel, and Abigail (5) and Benjamin (2) go to daycare, where I can watch them playing in the yard from my window.

Hey, look us up next time you’re in the neighborhood! I’ll try to do likewise.

email: bodner@iil.intel.com work: (4) 655-605, Intel Corp. / Haifa / Israel

home: (6) 399-663, 2 Hitta St. / Zichron Yaakov / Israel

JOHN MARTIN ’83

Earlier this year I presented a paper at ICCG93, an international conference on computer graphics held in Bombay. While in Bombay, I visited the Centre for Software Technology, which is doing world-class work in computer graphics, even with a somewhat limited computing infrastructure. I also had dinner with Dilip D’Souza, who was a CS graduate student when I was there. After working in Texas for a number of years, he returned to Bombay and is working on his own writing software for the Indian travel industry. We had fun discussing our days at Brown.

martin@nynexst.com

DON MILENKO ’84

I am a director of product development at Oracle Corporation in Redwood City, California, where I work in the applications division. We make exciting accounting, manufacturing, and human resource products.

RUSS ELLSWORTH A.B. ’79, Sc.M. ’85

Last seen by avd atop Mt. Greylock six years ago, and never heard from since, Russ has climbed out of the dungeon known as the Defense Industry and has taken a vow of poverty by returning to the wild world of education! Russ was appointed from a field of 60 candidates to the prestigious position of Director, MIS, at Berkshire Community College in Pittsfield, MA, just a stone’s throw from New York state. He lives in Windsor, MA, a hill town that still had snow last May and saw it again before November this year, with his wife Darleen, daughter Katrina (yes, named after Ms. Avery), son Craig, cats Bert and Ernie, and Tandy the wonderdog (named after a long-retired computer).

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ROSIE PERERA ’85

I’ve been working at Microsoft as a software design engineer since 1985. I worked on Word for Windows for several years, and am currently working on a major upgrade to Money. I return to Brown most years to do interviews when Microsoft has been on campus recruiting. I love the Seattle area, and Microsoft is a great place to work.

rosie@microsoft.com

WHOSE BRITISH VOICE IS THAT?

Reprinted with kind permission of Betsy Boyd, Contributing Writer, *The Brown Daily Herald*.

Chances are, the Computer Science office manager has reached out and touched you! Forget the 1-900 find-a-friend lines. Suzi Howe’s aristocratic British-accented voice makes dialing up a wrong campus number a pleasant experience. The call is free, it’s quick, and most of all, Howe really sounds sincere when she says, “I’m sorry, you’ve dialed incorrectly.”

Born in England, Howe came to the States in 1966 and has worked at Brown since ’77. She is the office manager of the Computer Science Department and program officer for their Industrial Partners’ Program, where fellow

office workers enjoy her sweet and soothing voice. So when Elizabeth Bisset, manager of operations in the telecommunications department, started looking for a voice for University recordings, Howe was at the top of her list.

"She just has a nice recording voice," Bisset explained. She said several employees were asked to leave sample messages, but Howe's was by far the smoothest. She was then selected to vocalize these messages, one of which can receive 125 callers at once.

"My first thought was, why do they want an English voice leaving messages at an American university," Howe said. She decided to cooperate, however, and has made a series of messages, including the "Thank you for holding" message, which was the shortest but most difficult to get right. "We had some good laughs doing that one," she said, explaining that she could not decide whether to end on an up or down note.

Suzi Howe

Howe says it took no special effort to avoid sounding like Lily Tomlin's "One ringy-dingy" Ernestine character. In fact, when the recording system first went on-line, a faculty member complained via the campus-wide electronic bulletin board that the voice was too sexy. When she returns to England, she says she is immediately pegged as an American tourist; but in Providence she definitely gets a different reaction. "I think Americans have a penchant for English accents," she said. "It's very nice that they do."

> *"I always wondered why there was a British accent on the message. It always puts me in a good mood when I hear it"*

"I always wondered why there was a British accent on the message," said Liron Shoham '96. "It always puts me in a good mood when I hear it." Howe said she also hears the messages. "I don't think a week goes by that I don't misdial and hear myself telling me so!" People she meets in the workplace find themselves trying to recall why her proper English voice sounds so familiar. Howe said she is not fond of public speaking and does not use her melodic voice for singing—she would rather be riding horses or gardening—two activities she admits are very English.

PETER'S DINOSAUR BOOK

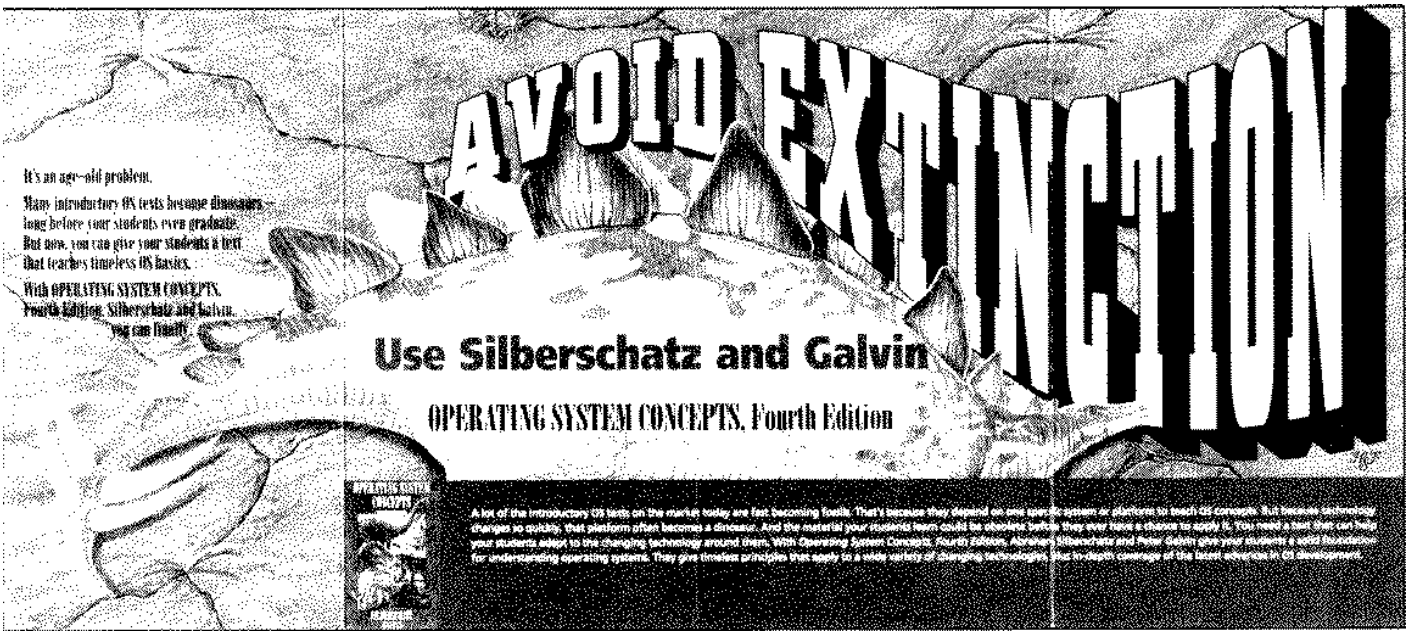
Peter Galvin

Peter Galvin graduated from Wesleyan in '84, and then went to the University of Texas, Austin, for his master's degree. It was there that he met Abraham Silberschatz, his advisor, with whom he coauthored the successful *Operating System Concepts*, now in its fourth edition.

At UT Peter used the second edition of *OSC* in class. When he was graduating, Silberschatz asked him to coauthor a computer architecture book. This project bogged down, as did the third edition of *OSC*, so Silberschatz asked him to coauthor the *OSC* book instead. Hence he became an author of the book from which he'd learned operating sytems.

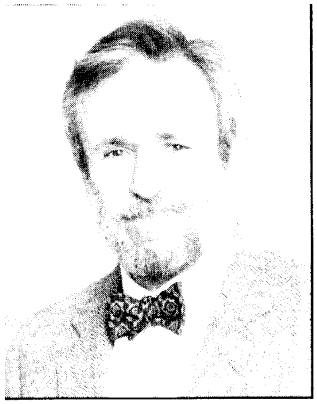
After graduate school, his first position was Systems Programmer at Yale's CS department, from where he upgraded to Systems Manager at Brown in '89. While at Brown he completed the fourth edition of *OSC*, known as "The Dinosaur Book" because of the dinosaurs on its cover and the timeless principles it espouses—concepts destined NOT to go the way of the dinosaur. Aficionados will doubtless have noted the evolution of the cover art in concert with that of the book's contents. Peter is currently working on two other books about operating systems, one of which should be on the shelves by year's end. When asked how he has time to write, he said he doesn't know, especially with a second child, a brand-new baby son, in the family. However, weekends and evenings are well utilized, departmental magnanimity helps a good deal, and, of course, so does Carla, his wife.

When he isn't writing, Peter is overseeing hardware and software for the Department. With the systems programmer, Rick Sabourin, and hardware technician, Max Salvas, he manages an environment of 170 Sparcstation 10s as well as the servers, the connective networking, the associated system software, and the Solaris operating system and application programs—Framemaker, TEX, Wingz, and Emacs. His specialties are performance tuning and security. In what little is left of his spare time, he serves on the Board of Directors of the Sun Users Group—not one to waste time in idleness!



Poster from Addison Wesley sent to operating system faculty

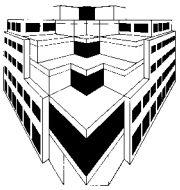
FROM THE CHAIRMAN, Eugene Charniak



Eugene Charniak

While waiting for the elevator a few months ago I picked up a copy of *Computerworld*'s "Campus edition'' from a stack left out for our students. In the table of contents was an article entitled "Where would you send someone to grad school?'' with the subheading "Industry VIPs pinpoint the hot education spots." Naturally I was curious to see if Brown got a mention, but told myself that articles like this are notoriously spotty and unreliable. This time, though, I was happy to see that Brown was one of the eight grad schools listed (the others were MIT, Texas, CMU, Michigan, Stanford, UCLA, and Berkeley). Also nice was Alan Kay's comment, "One of the best places, historically, for mixing all kinds of undergraduate experiences is a college like Brown.'' Naturally, after reading the article I had to tell myself again that articles like this are notoriously ....

A few months ago the CIT building (the home of the CS Department) was host to a computer-art exhibit, with computer-generated pictures by a number of people, including some of Professor of Mathematics Tom Banchoff's pictures of four-dimensional objects. One of the organizers and contributors was Anne Morgan Spalter, a Brown graduate and former Banchoff student. Readers of *conduit!* have encountered Anne's name in our recent article about the program to teach computer graphics to high-school teachers, which she helped present. Anne's official Brown title is "Adjunct Lecturer in Visual Art'' (she also has a position at RISD, the Rhode Island School of Design) and she is an accomplished artist who uses computers to create her work (I like her stuff, at any rate). How Anne got to this point in her career is an interesting story, and one of these issues we will have space for an article about her. Here I will just mention the substory for which Anne is most famous around Providence. About a year ago a strange and arresting billboard, a huge version of one of Anne's creations, appeared over I95, the main highway through Providence. It seems that Anne had been taking pictures of I95's passing scen-

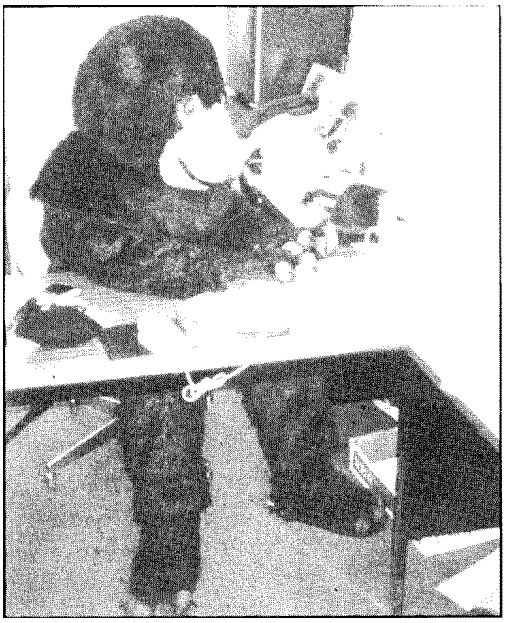


Anne Morgan Spalter

ery and creating new images by manipulating the photographs via various software packages. She then thought it would be interesting to put the result on a billboard so other drivers could see it. Unfortunately, upon calling a billboard company she quickly learned that billboard space is very expensive. However, further discussion revealed that the company was in the process of installing a computer system, and this led to a deal by which Anne exchanged computer consulting for billboard time. The billboard made it into Brown's *George Street Journal* and RISD's house newsletter and gave Anne the first few seconds of her Warholian 15 minutes of fame.

I have again completed the chairman's task of talking to all our CS faculty so I could tell the administration what they have been doing this last year. After I did this a year ago I reported in *conduit!* that Associate Professor Roberto Tamassia won my "invited lectures in the most countries'' award. This year he wins the award for the biggest result that got away. One of Roberto's papers this last year proved that a particular problem in graph theory was NP-complete. When he told me this, my first reaction was that I understood that NP-complete results were a dime a dozen these days. Roberto explained that in this case it was news because people had thought the problem was solvable in polynomial time. Roberto immediately responded that he really hoped that his colleague was right, because they would have one fantastic joint publication! (Unfortunately, the colleague turned out to be wrong.)

It is contrary to tradition to reveal the Brown Bear's identify, but one of our CS graduate students has been the skating Brown Bear at hockey games these past four years. Upon discovering this, we inquired via email if anyone else had similar talents and learned that another of our graduate students, Jonathan Monsarrat, was the MIT beaver in his undergraduate days. On only one occasion was the Brown Bear's identity revealed—when he was physically assaulted at a Princeton football game (it is said he deserved it!).



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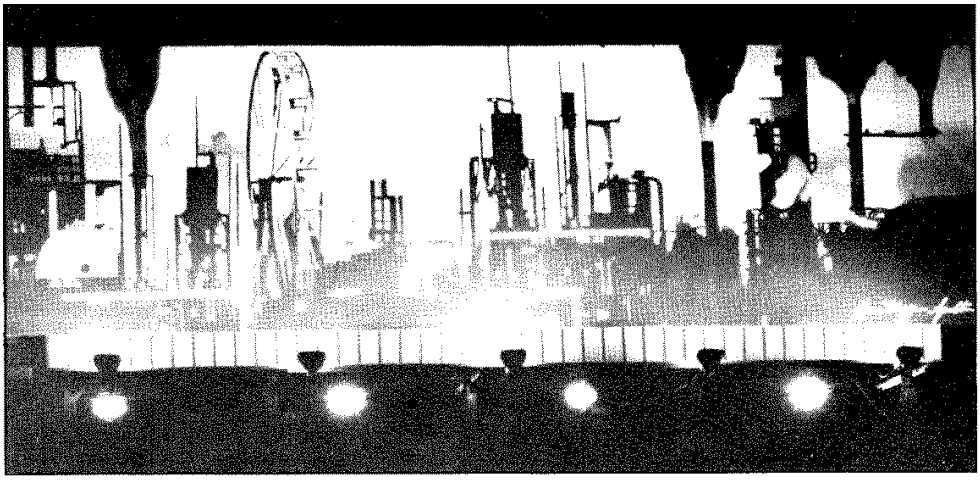
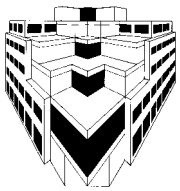


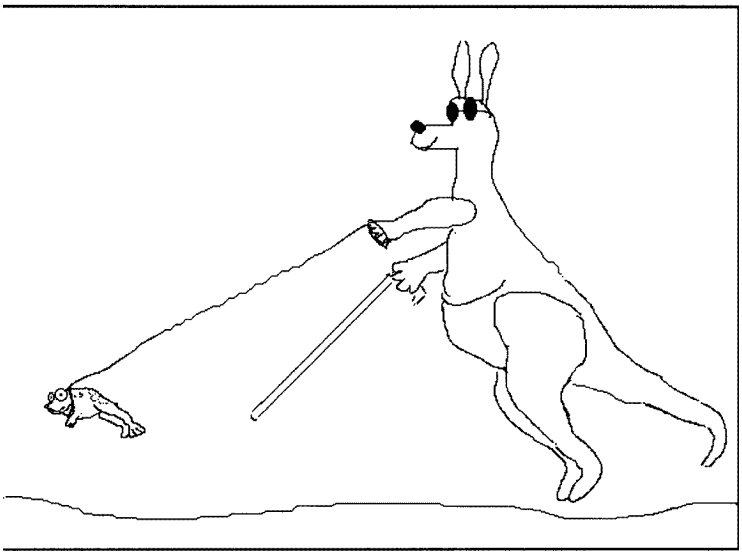
"The Modern Landscape" The design difficulties in creating this billboard were twofold: the size was colossal and the viewing time short. The artist's task: make this image memorable at 60mph. Hardware: Mac IICX, Mirror 600 Scanner and HP III Laserjet printer. Software: Photoshop 2.0, freehand

This semester Assistant Professor Leslie Kaelbling introduced our first robot-building course. The robots in question are "Lego'' robots, so called because they are built of standard children's Legos plus special equipment such as motors, bumpers, simple light sensors, infrared emitters and sensors for proximity detection and, of course, small on-board computers.



In order to encourage creativity and collaboration, the twenty students in the course pair up on robot building (though the TAs get their own kits). The university was able to find some of the money to buy the kits, and the department provided the rest. The midterm exam was a light-seeking and maze-solving contest held during one of the department's TGIF get-togethers to spirited rooting. For the final exam the class will host a robot "talent show.'' Put May 9 on your calendar.

There is always a tradeoff in academic departments between having professors go on teaching the same course, which saves time, and letting different professors take a crack at them, which gives new perspectives. An example of the latter is Professor Peter Wegner's new version of Computer Science 2, our "computers for poets'' course, which has has been taught over the years by many senior faculty members. A constant feature of the course is, of course, the need to get across some of the basics of computer science as well as some of the societal issues. To this end Peter has introduced several new features. One entertaining addition is the "warm-up'' competition for best picture done with Macpaint, held in the first weeks of class. Another interesting twist is Peter's use of Hypercard as an organizing tool for the course. Of course, students use it for their written assignments, and they are expected to use cross-referencing and the other Hypercard tools; in addition, they also use it to produce simple programming assignments. One assignment is writing a cash-register program for a (slightly) imaginary coffee shop. To the best of Peter's knowledge, the course is unique, and he is now considering writing a book based upon its principles.



"Seeing Eye Frog," judged most original in the CS2 art competition. By student Paul Shieh

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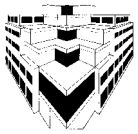

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