conduit!

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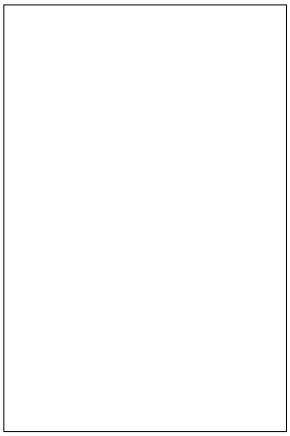
Brown University

VAN HENTENRYCK RECEIVES NYI AWARD FOR CLP RESEARCH

The Department is happy that Pascal Van Hentenryck received an NSF "National Young Investigator" (NYI) award this year for his work on constraint programming languages. As you may know, the NYI is an award given to the top young researchers in all branches of science and engineering. Pascal's award this year continues the Department's string—Leslie Kaelbling won it the year before, and Phil Klein the year before that.

—Eugene Charniak, Chairman.



Pascal Van Hentenryck

Pascal's NYI award concerns constraint programming (CP) languages—in his own words, "programming languages whose basic operations manipulate constraints instead of values as in traditional languages." Constraint program-ming languages have been around for some decades, but constraint logic programming (CLP) has recently given them a new dimension. "The combination of sophisticated constraint solvers and nondeterminism makes CLP languages appropriate for a variety of combinatorial search problems," Pascal points out.

Combinatorial search problems are ubiquitous in computer science; they appear in such diverse areas as hardware design, operations research, decision-support systems, and artificial intelligence. Assigning planes to gates in an airport so as to minimize the distance between connecting flights, allocating frequencies to mobile telephones, generating test cases to debug circuits or programs and optimizing investments in a portfolio are typical problems that constraint programming has tackled. "Many of these problems are inherently intractable, but computer programs can often generate, within given time limits, solutions that are comparable to or better than those produced by humans. For some of these problems, constraint programming may decrease the development time by orders of magnitude while maintaining efficiency at a reasonable level." Pascal's PhD thesis, published as a book by the MIT Press, pioneered the use of CLP over finite domains and led to the programming language CHIP, now marketed and used widely in industry. One of the first industrial applications of CHIP (developed by ICL) is the assignment of ships to piers in Hong Kong harbor. "The success of this application comes from its ability to model complex constraints in a concise way, yet maintain efficiency at a reasonable level through appropriate pruning of the search space." Since his PhD thesis, Pascal has investigated many aspects of constraint programming, developing new languages, designing new constraint algorithms, and producing sequential and parallel implementations.

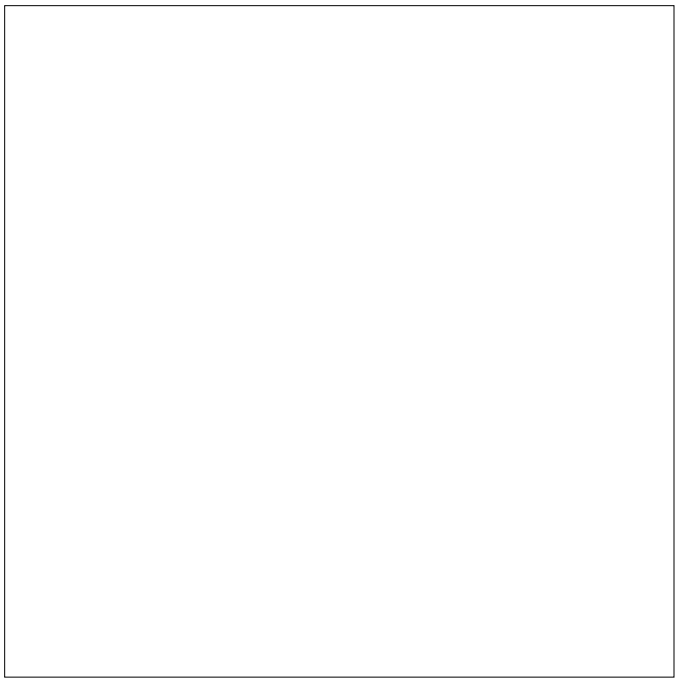
> *"For some combinatorial search problems, constraint programming may decrease the development time by orders of magnitude while maintaining efficiency at a reasonable level"*

CP language design has been a major focus in recent years. "Early languages showed the potential of the technology, and recent design

advances have made it significantly more applicable by improving both expressiveness and efficiency. For instance, in a CP language like my cc(FD), programmers can define their own constraints, combine them in various ways, and design their own control strategies. Some of the operations research community is now beginning to take constraint programming seriously.''

The benefits of languages like cc(FD) are best illustrated by mentioning some recent applications such as the perfect-square problem and digital-signal-processing (DSP) scheduling. ''The perfect-square problem is to pack a number of squares, all of different sizes, into a master square so that no two squares overlap and the master square has no empty space. The cc(FD) program is about two pages long and and takes about 10 seconds on modern workstations. A similar solution in C would require several thousand lines of code.'' For the DSP application, recoding an existing solution in cc(FD) yielded an important reduction in programming time with comparable efficiency.

"Of particular interest is the ease of modifiability and extensibility which simplifies experimentation with various algorithms and heuristics,'' Pascal says. cc(FD) was described in part in the *AI Journal* last year and will be distributed later this year, thanks to a Software Capitalization Grant from the National Science Foundation and a donation from Hewlett Packard. ''Much work remains to be done, however, to support additional paradigms for combinatorial search problems and to reduce the performance gap with procedural languages, which is still too large in some applications. Moreover, some problems are also inherently procedural, but would benefit from a declarative component. A smooth integration of constraint and object-oriented programming is a high priority.''



A solution to the perfect-square problem as found by cc(FD) in a couple of seconds

DINGERS DELUXE — DYNAMITE !

The Dingers Deluxe, the Computer Science Department softball team, participated in the Brown intramural league in the spring and in the Brown Summer Softball League. The 1993 team left no doubt about which department is Brown's finest. The Dingers won the high-intensity intramural championship in the spring. In the summer league, they again laid claim to the number-1 ranking with a perfect 15-0 record. Paraphrasing the immortal Casey Stengel, team captain Bob "Coach Z" Zeleznik scoffed, "Can any other department at Brown play this game?"

In the spring intramural league, the "old men" were pitted against undergraduate teams, many of them fraternities. In addition, the Dingers had to cope with players missing games to attend conferences, give demos to sponsors, or even teach software engineering courses. Nevertheless, they finished second after the month-long regular season, thus qualifying for the four-team playoff. Winning the first playoff game by forfeit, they were matched against Delta Upsilon fraternity in the championship game, a team that had beaten them 4-2 during the regular season.

The championship game has since gone down as one of the greatest in sports history. The scheduled 6-inning game was a close defensive struggle. With the score tied 3-3 in the top of the sixth, Zeleznik slugged the game's only home run, putting the Dingers ahead 5-3. DU stormed back in the bottom of the 6th to tie the game 5-5, and appeared ready to clinch the championship with the bases loaded and one out. But Jeremy Katz

turned a spectacular double play for the Dingers to send the game into extra innings. The game stayed tied through the next three innings, with Katz, Philip Hubbard, Andrew Kunz, and Harry Mamaysky making game-saving plays. In the top of the 10th, Nate Huang's fluke pop-up single scored Yi-Jing Lin, and Katz's double to the fence scored Huang. DU mounted yet another comeback, but to no avail. Matt "Pain" Corkum caught the final out, and the rowdy celebration was on at the Grad Center Bar! The "Intramural Champion" T-shirts were awarded at a department barbecue on the CIT balcony a few days later.

The teams in the summer league were of significantly lower caliber than in the spring league, and the Dingers usually lost track of the score after two or three innings. But there were some noteworthy opponents. In the season's toughest game, the Dingers held off their arch-rivals The Dream Team (Plant Operations) 11-7. Both teams have each won two games against each other in their past four seasons, with the winning margin an average of only two runs. The Dingers completed their perfect 15-0 season the day before half the team left for the SIGGRAPH conference in California.

Dingers Deluxe, l to r: Matthias Wloka, Lloyd Greenwald, Steve Reiss, Nate Huang, Tony Cassandra, Bob Zeleznik, Tony Davis, Matt Corkum, Yi-Jing Lin, Harry Mamaysky, Andrew Kunz, and Tony Teixeira, all wearing their Intramural Champion Ts

OUTREACH PROGRAM INTRODUCES 3D MODELING

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It isn't often that a high school science teacher gets to study under a great scientist, and then experiment in advanced fields such as three-dimensional modeling and virtual reality all at no cost. But this summer seven area high school science teachers spent three weeks at Brown University learning the concepts and techniques that helped make Jurassic Park a hit with movie audiences. The teachers, each accompanied by one of his or her students, joined computer scientist and graphics pioneer Andries van Dam and his colleagues for an intensive excursion into advanced computer graphics.

The experimental program offered math and science teachers and students a chance to learn how to create three-dimensional objects and make them look as realistic as possible by using "synthetic photographs." During the second and third weeks the participants spent up to six hours a day at workstations in Brown's Sun Lab, an electronic classroom filled with new Sun Sparc10 workstations, creating 3D models of a real-life object of their choice.

During the first week, they attended lectures by van Dam and professor John Hughes, co-director of the graphics lab, as well as by Anne Morgan Spalter, an adjunct lecturer in the Department of Visual Art. Other lecturers were the University of Utah's Beth Cobb, the University of North Carolina's Henry Fuchs and Cornell's Don Greenberg. The faculty are all part of the Science and Technology Center for Computer Graphics and Scientific Visualization (STC), a consortium of five institutions which received federal funding to create the center three years ago.

At the end of the course, the teachers were uniformly enthusiastic about the program and its prospects. Richard LaCivita of Attleboro High

School seemed to be speaking for the group when he said, “This has been one of the most exciting events of my life. I would lie awake at night thinking about it.” Van Dam had an inkling that the participants, especially the students, would be enthusiastic. “Getting young people interested in graphics is a piece of cake,” he said. The challenge for him, as a fellow teacher, was to involve students and teachers alike in the mathematical underpinnings of 3D graphics and modeling.

“If you want to have an impact on students, you have to turn their teachers on. The potential audience is much larger”

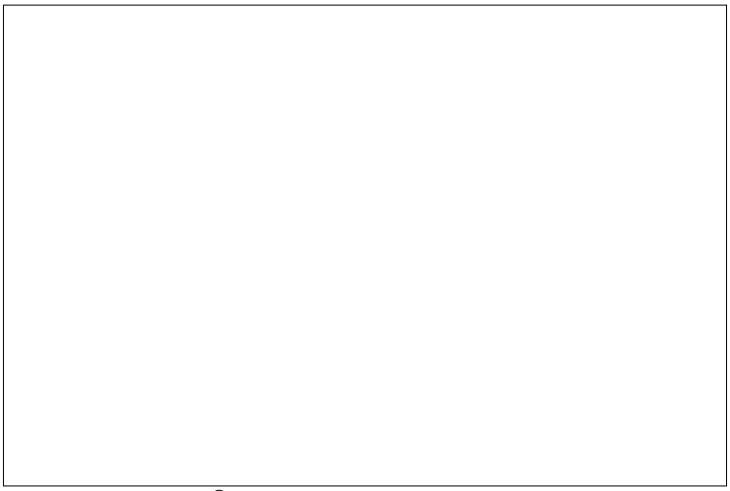
The graphics were created using a programming language called Alpha_1. In addition, the participants learned how to use MacroMedia’s Swivel 3D Professional, a Macintosh modeling program donated by the company to the high schools involved in the STC workshops. They had a chance to see 3D scenes, using virtual reality. They enjoyed “flying” around in a room with 3D abstract artwork, and experienced a “virtual” playground.

Van Dam said he developed the course because he loves to get young people involved in science, and the most efficient way to reach students is through their teachers. “If you want to have an impact on students you have to turn their teachers on,” he said. “The potential audience is much larger.” He asked each teacher to bring along a student so they could learn from each other. One such student was Mike Ross, who will be a senior at Sharon (Mass.) High School next year. Ross was able to handle the complex material just fine, although he added, “The amount of information thrown at you is incredible. It will take a while to absorb it all.”

Van Dam began the project this spring with a mailing to area schoolteachers to measure their interest. He offered them a program in which teachers could study the same material covered by Brown juniors and seniors. Apparently, the prospect of giving up three weeks of their summer vacation was not a deterrent. “I wanted to come as soon as I heard,” said LaCivita, a mathematics teacher at Attleboro High. “The opportunity to study with van Dam was the icing on the cake. I had read his piece in Scientific American in 1984 and I knew he had written the book on computer graphics *(Computer Graphics: Principles and Practice*, by Foley, van Dam, Feiner and Hughes, 1990).”

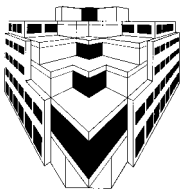
Van Dam’s idea was to give secondary school teachers and students access to some of the STC’s resources and research software. He hoped the teachers would carry the material back to their classes, where they would reach students who would eventually attend college.

Van Dam uses the visual capabilities of computers to present and explain mathematical concepts that usually remain abstract and, even for good students, difficult to grasp. “The study of computer graphics in high school,” he wrote in his letter to the teachers, “can offer a rich middle ground between the complete abstraction of much mathematical subject matter and the difficulty of dealing with real-world objects and behaviors in mathematically oriented sciences such as physics.” In one of the workshop’s highlights, Don Greenberg of Cornell lectured. Van Dam introduced him as “the foremost academic in computer graphics and photo-realistic rendering. He runs the best graphics group in the world.” Greenberg, who also has an appointment in the architecture department at Cornell, showed the group how to create computer images of buildings that were virtually indistinguishable from the real thing. Then he taught them how to distinguish between the two.



Andries van Dam explains splines and surfaces of revolution to a student participant

Polly Carter, head of the science department at Milton High School, brought two students with



her. She plans to use the material she learned in the class in a graphics course she will teach this fall to elementary school teachers in Norfolk County, Mass. That 40-hour evening course carries graduate credit through Fitchburg State College. "I intend to show them the mathematical underpinnings—what's under the hood," she said. Carter praised the Brown program. "I can't say enough about how helpful this has been. The materials, the support, the people, the access, all of it has been wonderful." Stephen Marshall, a student from Seekonk High School, said he planned to take the same workshop next summer. "This is a really great course," he said. "It is terrific to be able to study under world-class instructors like Greenberg, van Dam and Hughes."

"That a teacher can honestly say she looks forward to going to a two-hour lecture/demo after a full day in the classroom speaks for itself"

Sister Mary Catherine Burns of Coyle and Cassidy High in Taunton, Mass., took an earlier version of the workshop this past spring, driving down after school. She later wrote in support for the program: "That a teacher can honestly say she looks forward to going to a two-hour lecture/demo after a full day in the classroom speaks for itself!" Funds for the workshop came from the National Science Foundation (NSF), the Advanced Research Projects Agency and Brown. Equipment was donated by IBM, DEC and Hewlett-Packard. Van Dam said he will seek NSF funding to offer the workshop again next summer.

Alumni Are Behind the Scenes of Hollywood's Computer Graphics

A handful of Brown CS graduates who specialized in computer graphics have joined the film industry and have been involved in recent films.

JURASSIC PARK

Michael Natkin '89 and ***Brian Knep '90*** both worked on *Jurassic Park* while with filmmaker George Lucas's company, Industrial Light and Magic (ILM). Both worked on the software behind the movie's graphic sequences.

TERMINATOR 2

Natkin and fellow alumnus ***Scott Anderson '87*** worked on this film as employees of ILM. Natkin was a software designer and Anderson supervised a team that put together some of the film's dramatic sequences. Anderson said he worked primarily on the "death sequence," in which the character played by Arnold Schwarzenegger is lowered into a bubbling vat of molten metal and is destroyed. Computers simulated much of the action. The bubbling metal itself, Anderson says, was composed of water, mineral oil and methucil, a food thickener used in Hostess Twinkies and shakes at McDonald's.

THE ABYSS

Scott Anderson used computer graphics to create a water-snake called "the pseudo-pod" for this film. He did the software design and some animation before focusing on what he called "look and lighting"—getting the surface and the reflections to match the scene, making it look more real.

BLACK OR WHITE

Michael Jackson's 1992 video used the talents of many experts, including ***Barbara Meier ('83 B.A., '87 M.S.)***, who works at Pacific Data Images. Meier also worked on the movie *Toys*, with Robin Williams.

BEAUTY AND THE BEAST

Mike Shantzis ('84 B.A., '86 M.S.) won an Academy Award for his graphics work on this film from Disney Studios. Shantzis works for a company called Pixar, which was under contract to Disney to create some of the groundbreaking animation sequences in the film. Shantzis won his award in 1992 for "technical achievement" or, in the words of one observer, creating new technology that will have a lasting impact on the way films are made. The system that he worked on (called CAPS for Computer-Aided Paint System) was used in *Beauty and the Beast*, as well as *Rescuers Down Under* and *Little Mermaid*.

LOOK WHO'S TALKING NOW

The third film in the sequence that began with *Look Who's Talking* will be released in November. Scott Anderson has been working for about 18 months as the film's visual effects supervisor. "I supervise the live-action photography that the effects are going to be used in conjunction with," he said His team is doing both computer-generated effects and "old-style" optical effects. Anderson worked on the live-action side of this animated feature, to be released soon by Hanna-Barbera, but most of the post-production work is being done by a computer graphics company called XAOS in San Francisco, where ***Cassidy Curtis '92*** works.

Eugene Charniak. Eugene's paper "Equations for Part-of-Speech Tagging" has been chosen for the AAAI-93 Award for Best Paper. A certificate in recognition of this achievement was presented at AAAI-93 in Washington, DC. A paper co-authored by Tom Dean and Leslie Kaelbling was a runner-up.

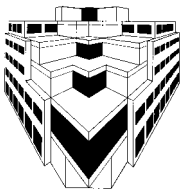
Thomas Dean. Tom was elected to a three-year term on the executive council of the American Association for Artificial Intelligence. He spent most of August finishing a draft of a textbook on introductory artificial intelligence. The draft will be used in courses this fall at Brown, the University of Wisconsin, and Oregon State.

Thomas Doeppner. Tom was a visiting faculty member at the CERN School of Computing at L'Aquila, Italy, for a week in September.

Paris Kanellakis. Paris and Pascal Van Hentenryck organized the First Workshop on Principles and Practice of Constraint Programming sponsored by the Office of Naval Research in Newport, RI, last April. This was a well attended interdisciplinary meeting (over 60 researchers from all over the world) focusing on constraint programming as a general paradigm for computation. Paris has joined the editorial boards of two journals—the *ACM Transactions on Database Systems* and *Information and Computation*. He was an invited speaker at the NATO ASI workshop on Object-Oriented Databases in Kusadaci, Turkey. In the coming year he will be on the program committees of ACM SIGMOD-94 and IEEE LICS-94 and will be an invited speaker at the International Symposium on Theoretical Aspects of Computer Software (TACS '94) in Sendai, Japan.

Philip Klein. Phil was on the program committee for the ACM-SIAM Symposium on Discrete Algorithms. He will be an invited speaker at Columbia's Theory Day, at the DIMACS Workshop "Parallel Algorithms: From Solving Combinatorial Problems to Solving Grand Challenge Problems," and at a minisymposium "Approximation Algorithms" at the SIAM Conference on Discrete Math.

Pictured on the steps of the Eisenhower House in Newport are participants in the First Workshop on PPCP. Invited speakers were Anil Nerode (top right, standing), Alain Colmerauer (2nd from left, top row) and Hervé Gallaire (not pictured). Co-chairs were Jean-Louis Lassez (3rd from left, front row), Paris Kanellakis (5th from left, front row) and Vijay Saraswat (not pictured)



Scott Meyers. Scott's book *Effective C++* was given a Computer Language Productivity Award. It has been translated into German and Japanese; the Chinese translation is in progress, and it will soon be available in French also.

Robert Netzer. Rob won an NSF grant to work on his research on adaptive tracing for parallel and sequential program debugging.

Franco Preparata. Franco was a co-recipient of the 1993 Darlington Prize of the IEEE Circuits and Systems Society for his work on the analysis of propagation delays in VLSI. He was the featured speaker at the Sprint Midwest Theory Meeting and the 1993 Distinguished Lecturer in Computer Science at Dartmouth College, in addition to presenting seminars at various universities. In the summer he directed and lectured at the Fibonacci School on Parallel Computation in Trento, Italy.

John Savage. John was an invited speaker at the ONR International Workshop on Models for High-Performance Computing in Warsaw. He was re-elected to the Board of Directors of the Computing Research Association, and in July joined the editorial board of the *Journal of Computer and Systems Sciences*.

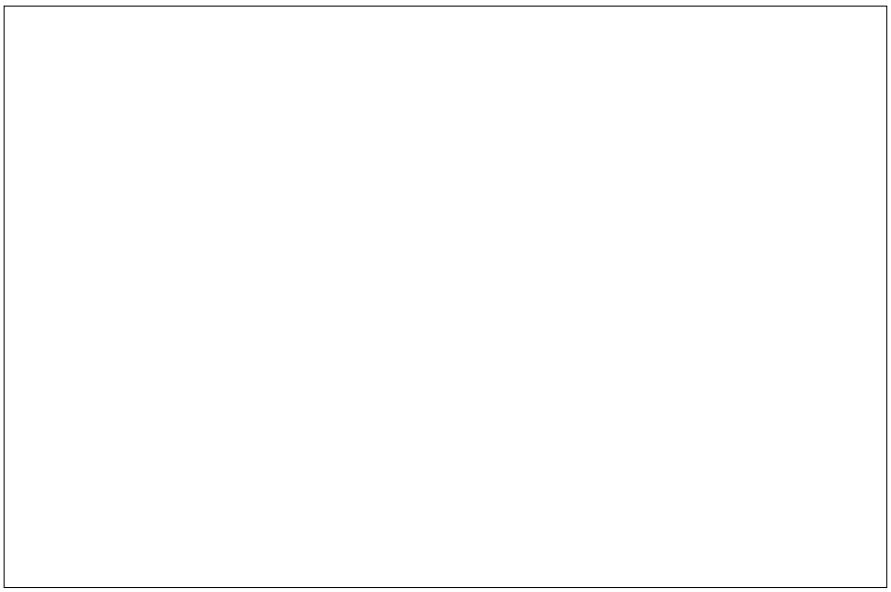
Roberto Tamassia. Roberto is now a tenured member of the CS faculty. He is on the program committee for the ACM Symposium on Computational Geometry to be held June 6-8 in Stonybrook, NY, and the ACM Symposium on Theory of Computing to be held May 23-25 in Montreal; he will be an invited speaker at the Second Italian Conference on Algorithms and Complexity, February 23-25, in Rome.

Andries van Dam. Andy was an invited lecturer at the GSD at Harvard; he gave three invited lectures in Italy at the Center for Advanced Studies, Research and Development in Sardinia and gave the keynote on Interactive Animation at the Sixth International Conference on Computer Animation at the University of Geneva.

Pascal Van Hentenryck. Pascal will give a tutorial at IJCAI on constraint programming as well as invited talks at WSA '93 in Italy, the University of Linköping, Sweden, and ECRC, Munich. He will be a panelist at TAI '93. Pascal is chairman of the next international conference on Logic Programming (ICLP '94) and is on the program committees of PEPM and PPCP '94. He received an NSF National Young Investigator award this year.

Peter Wegner. Peter was the keynote speaker at a conference on Logic and Automatic Programming in St. Petersburg in July; he also lectured at Imperial College London, and at a workshop on distributed object-oriented programming at the European Conference on Object-Oriented Programming (ECOOP), as well as at the Software Engineering Institute in September. His edited book on object-oriented concurrent programming is being published by MIT Press this fall.

Stanley Zdonik. Stan taught part of a summer school course at MIT on object-oriented technologies and gave several lectures on object-oriented databases as part of a NATO-sponsored summer school in Kusadaci, Turkey. He was on the organizing committee for the 4th International Workshop on Database Programming Languages which was held in New York City at the end of August.



Symposium speakers, l to r: Manolis Tsangaris, Paris Kanellakis, Michael Brodie, Tom Atwood and host Stanley Zdonik

THE 11th INDUSTRIAL PARTNERS PROGRAM SYMPOSIUM

On Tuesday, April 27, the Department's Industrial Partners Program hosted a day-long symposium on topics related to object-oriented database (OODB) systems. The morning was organized around discussions on use of OODBs as system integration tools; and the afternoon devoted to discussions about query languages and query processing in this new style of database.

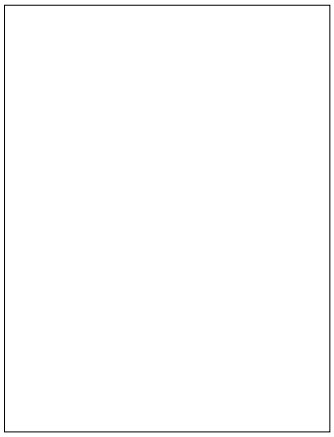
Each of these sessions included three formal talks from faculty and well-known industrial researchers. Many interesting research problems were raised and various solutions were proposed. Lively discussions among the participants contributed to the success of this event. Michael Brodie (GTE Labs) started the day off with a very interesting talk on a technique for managing legacy systems. He outlined some of the current commercial approaches to system integration such as CORBA and then described a methodology that has been successful in several applications. Tom Atwood (Object Design, Inc.) and Mike Renzullo (DEC) added their own views on this topic to finish off the morning session.

The afternoon was spent on more detailed topics related to OODB implementation. Stan Zdonik and Paris Kanellakis discussed techniques for the query-processing component of an OODB and Manolis Tsangaris (Bell Communications Research) concluded the day with a stimulating discussion on two new algorithms for automatic object clustering. He showed us his very promising performance results that he obtained using a heuristic based on graph partitioning.

The next symposium, scheduled for October 15, will be hosted by John Hughes; the topic is Frontiers in Visualization. Speakers include Andy van Dam, Brook Conner and Steve Reiss from Brown; Steve Feiner from Columbia, Ben Bederson from Bellcore; and George Robertson from Xerox PARC.

THE NEW COMPUTER SCIENCE CURRICULUM

Due to its profound societal impact and the pressure of extraordinary technological developments, the computer field—to a much greater extent than many other disciplines—is a constantly evolving reality. The agents acting on it are a synergistic aggregate of industry, government, academia, and a multifaceted user population. This scenario exerts substantial pressure on curricular evolution. Other factors tend to dampen the frequency of innovation, such as an understandable desire for stability and continuity beneficial to both faculty and students, and the intent to filter out "trendy" suggestions. Over the past decade our department had consistently maintained or overhauled individual courses, but never globally confronted its curriculum. However, tensions toward innovation accumulate with time until they make a curriculum overhaul unavoidable. Our department found itself at that juncture and, through its Curriculum Committee, opted for a major revision that is likely to give a longer lifespan to the new curriculum.



Franco Preparata, Chairman, CS Curriculum Committee

The current major revision effort involves a paradigm shift, that is, the adoption of the object-oriented viewpoint both in the programming courses and in the programming components of courses. This shift reflects the modern industrial practice to achieve for software degrees of modularity and reusability comparable to those achieved long ago for hardware. Such an approach is crucial to improving the efficiency of software design, and object-oriented programming appears a most suitable answer to such demands. While our department had been teaching C++, the most widely-used object-oriented language, in its software engineering course, the present change brings this philosophy to the first courses.

Therefore, our introductory programming course (renamed CS15) has replaced the traditional procedural PASCAL with object-oriented PASCAL, while exploration of alternative language choices goes on. The simpler object-oriented PASCAL has been pedagogically preferred to the more intricate C++, in order to separate the principles from the complexity. This modification has resulted in a new version of the introductory algorithms course (CS16), which now casts basic algorithms and algorithmic techniques within the framework of object-oriented programming, and has set the stage for the migration to the lower division of the introductory software engineering course (CS32), which focuses on object-oriented design, C++, the software lifecycle, and software development environments.

Another important curricular revision concerns the introductory computer systems course (CS31), which de-emphasized machine language programming in favor of a mature, integrated view of hardware/software and an introduction to operating systems.

> *"We have taken the pragmatic approach of introducing our students to the field by total immersion in the prevailing practice—programming, algorithms, systems, software "*

These four courses, each a major revision of an existing course, have also been sequenced in a more coherent way and accordingly renumbered. For example, CS15 and CS16 appear as the components of a one-year sequence. Finally, the formal foundations have been strengthened with the development of an introductory theory course (CS51), which builds upon the revised discrete mathematics course (CS22) and is constructed around the notion of computability, while exploring various alternative formalisms for expressing computable functions.

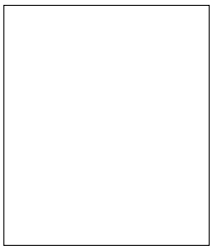
At this stage we have completed the design of the lower-division offerings. We have taken the pragmatic approach of introducing our students to the field by total immersion in the prevailing practice—programming, algorithms, systems, software—which motivates (and is complemented by) the exposure to the formal foundations for the discipline. This well-balanced set of offerings sets the stage for fine-tuning the upper-division courses, which constitutes the upcoming task of the Curriculum Committee.

Chairman's secretary Jennet Kirschenbaum on the patio outside the CIT Building on her 1989 Harley Sportster

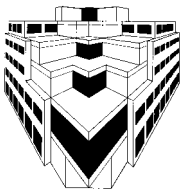
FROM THE CHAIRMAN, Eugene Charniak

We have had several promotions in the department this year. Roberto Tamassia (whom devoted readers may remember as the winner of my contest in the last issue for invited talks in the most countries) has been promoted to Associate Professor (with tenure). Tom Dean, whose robotics work has been mentioned in several ***conduit!*** articles, has been promoted to Professor. While we are delighted to report both of these, the most ''newsworthy'' promotion, because of its unusual features, is that of John Hughes. John (or ''Spike,'' as he is known around the department) has been at Brown for ten years now, since completing his Ph.D. in mathematics at Berkeley and coming to Brown as Jacob David Tamarkin Assistant Professor of Mathematics (despite its title, this is actually a post-doc position). In the course of his work there he became interested in computer graphics, and after his post-doc was finished moved over to our department as Associate Professor (Research), where he worked with Andy van Dam and became co-PI of the Brown branch of the NSF/ARPA Science and Technology Center for Computer Graphics and Scientific Visualization. In this environment he blossomed. For example, in the last three years he has had six articles in the SIGGRAPH Proceedings; this is the most important conference in computer graphics, with an acceptance rate of about one paper in ten. In recognition of his achievements, in our search last year for a new Assistant Professor, we ultimately chose Spike. Of course, while this was a promotion to a ''tenure-track'' position, it required Spike to take a ''demotion'' in terms of title, from Associate to Assistant Professor.

As everyone knows, though, faculty come and go but it is really the staff that makes a department function. This department has always been blessed with great staff. In particular, in the two years since Brown established its ''Brown Says Thank You'' award for staff who have performed above and beyond the call of duty, two of our staff members have won it, one each year. Last year it was Max Salvas. As many of you may know, Max has worked in this department for ten years now, keeping our machines going. Max is a whiz at fixing computers, and is a major reason we are able to negotiate superior maintenance agreements for our machines. He is also great with coffee grinders, automatic coffee makers and



Max Salvas, fix-it king



even the lowly stapler.

This year Jennet Kirschenbaum received one of these awards. Jennet's official job is secretary to the department chair, and I can attest to the fact that she does an incredible job. But Jennet is generally known in the department as an all-round ''utility infielder'' who can handle any contingency, from speaking firmly to repair people who do not think they really need to show up until next week to getting quotes from just one more vendor to get the best possible price. Her combination of intelligence and moxie is captured by the accompanying photo of Jennet and her favorite mode of transportation, her Harley.

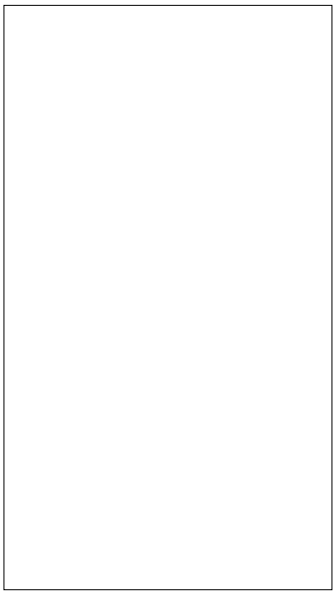
Congratulations to Ramamurthy Ravi who successfully defended his dissertation "Steiner Trees and Beyond: Approximation Algorithms for Network Design." He is currently a post-doc at the University of California at Davis. Ravi will be sorely missed by the CS band for which he was lead singer and rhythm guitarist. His renditions of Elvis and Dylan classics have gone down in the annals of Departmental history.

PhD candidate Dina Goldin Karon won the campus-wide Energy Awareness Campaign Logo contest. She received a $200 gift certificate to be used at the Brown Bookstore. Her eye-catching logo, bearing the slogan "Use Your Power Wisely," will be featured throughout campus to remind faculty, staff and students to save resources.

Incoming graduate students include ten Ph.D. candidates, 16 Master's candidates and two special students.

On a more personal note, I am happy to report that since the last ***conduit!***, which showed my mug collection, several people have asked to see it. Of course, since many people who saw the newsletter have NOT asked to see it, perhaps I should be getting a different message. Undaunted, however, I have now added another shelf of mugs to my collection.

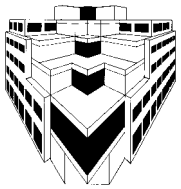
Finally, we will establish a column on alumni news. A lot of you alums out there are doing interesting things, and we would like to know about them. We have included at the end of this ***conduit!*** a ''coupon'' to send in with some information on what you are doing, or you can send email to Suzi Howe (alumni.news@cs.brown.edu). As we expect that most of you may feel too busy (or leading too boring a life) to send it in, those of you who overcome your hubris and/or modesty are almost sure to have your contributions prominently displayed.



Dina Goldin Karon and winning entry

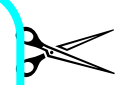
IMPLEMENTATIONS OF THE GRAPHICAL USER INTERFACE DESKTOP PARADIGM

Whose offices are these? Answer on back page!



ALUMNI NEWS

You and your activities



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New? ❐

conduit!

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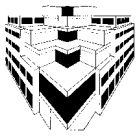

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