

Department of Computer Science & Engineering
University of Washington

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Anna Karlin Joins Faculty

Anna Karlin joined the faculty as a Visiting Associate Professor for two years beginning September 1994. Karlin received her PhD from Stanford University in 1987. She spent a one year postdoc at Princeton in 1987-88 before moving in 1988 to the Systems Research Center of Digital Equipment Corporation in Palo Alto, California, where she was a research scientist until autumn 1994.



Anna Karlin

At the urging of our department Karlin applied for, and was awarded, an NSF Visiting Professorship for Women. For several years Karlin had been thinking about moving from industry to academia. The process of applying for the Professorship catalyzed her thinking, "The Professorship is a wonderful stepping stone to make the transition to a long-term academic career." Karlin hopes that she can serve as a positive role model for other women who are interested in science and engineering and may be considering a career in teaching and research.

Karlin's research area is design and analysis of algorithms with a focus on on-line algorithms, competitive analysis, and probabilistic analysis of algorithms. She has a special interest in application of her work to operating systems, parallel systems, networks, and compilers. Coming from a strong theory background, her 1988 joint paper titled "Competitive

snoopy caching" was her first attempt at applied algorithms and she has been hooked ever since. In the paper, Karlin showed that snoopy caching algorithms could be analyzed "competitively." In practice, a snoopy caching algorithm is on-line, that is, the algorithm has no knowledge of future memory requests, so that it must decide what to retain and what to discard from the cache without knowing the future. She and her colleagues designed an online snoopy caching algorithm that performs within a factor of two of an optimal clairvoyant strategy. In

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Distinguished Lecturer
Schedule Page 3

Bershad Wins Presidential Faculty Fellow Award

Assistant Professor Brian Bershad was awarded a 1994 Presidential Faculty Fellow (PFF) Award, the first ever awarded to a faculty member nominated by the University of Washington. For the past four years the National Science Foundation has awarded 30 PFFs annually to the very best young scientists and engineers in the United States.

Bershad received his PhD from the department in 1990 then spent three years on the faculty of Carnegie Mellon University. *Bershad continued on page 2*

Chambers Wins NYI

Assistant Professor Craig Chambers received an NSF Young Investigator Award this year. The NYI, formerly known as the Presidential Young Investigator Award, is a highly competitive national award given to the very best of academic researchers in the early years of their careers. Chambers is the fifteenth faculty member in the department to receive an NYI or PYI.

Chambers received his PhD from Stanford University in Spring of 1992, shortly after joining the faculty in the autumn of 1991. His research is divided among the design and implementation of a new object-oriented programming language. *Chambers continued on page 2*





Brian Bershad and Craig Chambers

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versity in Pittsburgh. In 1993 he returned to UW as an Assistant Professor. Since returning, Bershad has begun several major research projects. The first is SPIN, an extensible operating system, which combines the efforts of Professors Bershad (operating systems), Susan Eggers (architecture and compilers), and Craig Chambers (compilers and languages). SPIN is a microkernel which supports the dynamic adaptation of systems interfaces and implementations through direct application control, while still maintaining systems integrity and inter-application isolation. SPIN is supported by a \$3,000,000 grant from ARPA (Advanced Research Projects Agency).

Bershad, with Professors Gaetano Borriello and John Zahorjan, also supervises two projects in mobile computing, Mobisaic, an information system for a mobile and wireless computing environment, and Wit, a system infrastructure for mobile handheld computing.

Last year Bershad was named an Office of Naval Research Young Investigator.

Chambers continued from page 1

oriented programming language called Cecil and a new optimizing compiler infrastructure called the Vortex Compiler. Cecil is an experimental language which is used to test out new ideas in object oriented languages. The Vortex Compiler allows compiler writers to employ object oriented compiler optimization across different languages. The Vortex Compiler now compiles Cecil and Chambers is in the process of using Vortex to port compilers for C++ and Modula-3. Chambers also works with Professors Bershad and Eggers on the Spin Project.

In addition to research Chambers has revised the compiler courses 401 and 501. He designed and built a C++ infrastructure for compiler projects in both courses. CSE 501 is now an advanced continuation of CSE 401.

Craig and his wife Sylvia had another award in September 1994 with the arrival of their first child, Caitlin McLaughlin Chambers, 8 pounds, 2 ounces, and 20 inches.

Honors to Our Graduates

The following students in Computer Science or Computer Engineering received honors upon graduation this past year:

Summa Cum Laude (3.93 – 4.00)

Vasily Shmatikov
Helle Spector

Magna Cum Laude (3.77 – 3.92)

Hon-Wai Chow
David Franklin
Benjamin Gilbert
John A. Hempe
Mark Hirayama
Alice Lockhart
Kok-Wei Koh
Tsz Ling Ng
Winnie Ng
Neill Symons
Paul Torvik

Cum Laude (3.64 – 3.76)

Jason Bartell
Scott deBeaubien
Greg Fichtenholz
Tyrie Grubic
Paul Lacrampe
Edward Lam
Yung-San Chris Lee
Njono Sampoerno
Paul Schwartz
Erich Vonnormann
Danny Wu
Ka Yan Yiu

Congratulations to all our students upon their graduation!

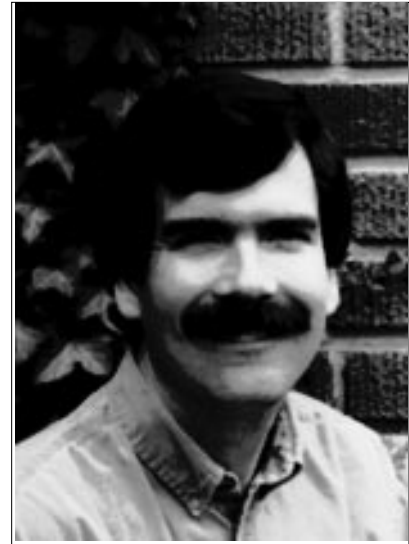
Tom Anderson Wins PFF Ed Felten Wins NYI

Tom Anderson, a 1991 graduate, was selected as a 1994 Presidential Faculty Fellow (PFF) and Ed Felten, a 1993 graduate, was selected as a 1994 NSF Young Investigator (NYI). Anderson, who is now an Assistant Professor at the University of California, Berkeley, joins Brian Bershad (CSE faculty member and 1990 graduate) as one of 30 PFFs chosen this year. Anderson's dissertation, titled "Operating System Support for High Performance Multiprocessing," was done under the supervision of Professors Ed Lazowska and Hank Levy. The PFF, which is administered by NSF, provides \$100,000 per year for up to five years. Anderson had previously been awarded the NYI in 1992.

Ed Felten, who is now an Assistant Professor at Princeton University, did his

dissertation under the supervision of Professors Ed Lazowska and John Zahorjan. His dissertation is titled "High Performance Communication for Data-Parallel Programs." The NYI award provides \$62,500 from NSF and up to \$100,000 including matching funds from industry.

Anderson and Felten join three other CSE graduates who have been awarded major, nationally competitive faculty awards: NSF Presidential Young Investigator (PYI), NSF Young Investigator (NYI), and Presidential Faculty Fellow (PFF). Others receiving awards are Udi Manber (1982) who received a PYI in 1985, Anne Condon (1987) who received an NYI in 1992, and Brian Bershad (1990) who received a PYI in 1991 and just received a PFF this year (see story on page 1).



Dean Tullsen

First Microsoft Fellowship Awarded to Dean Tullsen

Dean Tullsen is the first graduate student to receive the Microsoft Fellowship awarded by the Department of Computer Science and Engineering. The award of approximately \$15,000 will enable Tullsen to progress toward his PhD degree. At least one such graduate fellowship will be given annually in perpetuity thanks to the generosity of Microsoft Corporation.

In 1993 Microsoft Corporation gave \$1,000,000 to the department to endow a professorship, undergraduate scholarships, and graduate fellowships. The Microsoft Graduate Fellowship endowment started with \$200,000 from Microsoft and was matched with \$100,000 from the Graduate School.

Tullsen came to the University of Washington in September 1991 after earning a BS in 1984 and an MS in 1986 from UCLA. At UCLA he was *summa cum laude* earning a 3.9 GPA. From 1986 to 1990 he was a member of the Technical Staff at AT&T Bell Laboratories/AT&T Computer Systems, Naperville, Illinois. Since coming to Washington he has excelled in his course work and research. His research, which is supervised by Professor Susan Eggers, is in computer architecture.

DISTINGUISHED LECTURER SERIES

The Department of Computer Science and Engineering has announced the 1995 Distinguished Lecturer Series.

APRIL 20 — THURSDAY

David Johnson, Bell Labs

"The Traveling Salesman Problem"

APRIL 27 — THURSDAY

Ed Catmull, Pixar

"The Problems of Lighting in Computer Graphics"

MAY 4 — THURSDAY

Nils Nilsson, Stanford University

"Artificial Intelligence: Where Are We? Where Are We Going?"

MAY 11 — THURSDAY

Maria Klawe, University of British Columbia

"Electronic Games and Interactive Multi-Media: A Power-Up for Math and Science Education?"

All lectures are held at 3:30 p.m. in 210 Kane Hall, University of Washington, and are open to the public. A reception in the Walker-Ames Room follows each lecture. Inquiries may be directed to the Department of Computer Science and Engineering: (206) 543-1695.

MY YEAR IN INDIA

by Richard Anderson

I spent the 1993-1994 academic year as a visiting professor at the Indian Institute of Science in Bangalore, India. It is not possible to summarize the year's experiences in this short article, however a set of letters that I sent home to colleagues is available on the web at URL: <http://www.cs.washington.edu/homes/anderson>.

In many ways, working at IISc was similar to UW. I had an office, access to computing facilities, students would stop by occasionally, there were plenty of talks to go to, and I taught a graduate level course on parallel computation. It was virtually the same as a UW course, except that I had the only copy of the textbook, and the students all photocopied it. The department supplied me with a PC and I had somewhat regular email and Internet access. Printing was inconvenient, but not impossible, which just meant that I used lineprinter output instead of laser printer output for early drafts of papers.

Everyday living provided more excitement and frustration than the professional side of the sabbatical. (Of course, if we were looking for convenience and efficiency, we would have been much better off going to Redmond for the year.) The Institute provided us with a nice apartment in the center of campus for 500 rupees per month. (I'm not going to do the conversion for you, but for another data point we paid 750 rupees per month to rent a TV set.) We did our own shopping in the local markets which provided a tremendous range of fruits and vegetables. Mango season, by itself, made the year worthwhile. Buying meat in the market was a sufficiently dubious prospect so that we chose to restrict our meat eating to restaurants, where we could pretend that the meat had a better pedigree. Traveling around the city was always an adventure. We generally traveled in an auto rickshaw, which is an open, three wheeled taxi. Road travel was certainly the most dangerous thing that we did all year. On one ill-fated

journey, my wife noticed smoke and sparks coming from the front of the auto rickshaw. I assumed that the driver was just smoking, so that it was no big deal. However, we pulled over and the auto burst into flames. The driver managed to put out the fire, so we got back into the auto and resumed the journey.

I had numerous opportunities for professional travel. I had made quite a few contacts before going to India, many of them from a posting to soc.culture.india. I visited several small colleges in the south of India. I had known that the IIT's provided a very good education, but I was quite surprised at the quality of the lesser known places as well. The visits also were a chance to spend several days seeing an exotic locale. One place in particular, with its guest house 100 yards from a palm fringed beach, seemed like "tropical paradise college."

One of my goals for the year had been to learn something about the Indian software industry. I wasn't entirely successful at this, although at one point I was invited to give a public lecture by Apple Computing. Apple Computing offered classes and certificates in software engineering, and had no connection with Apple Computer, Inc. By the time I realized who the audience was, and that I really didn't have anything appropriate to say, it was too late to back out. I made the best of it by giving a talk "Computing of the Future," culled from Hennessy & Patterson and *Newsweek*. The talk was not brilliant, but the question and answer period lasted over two hours. The audience submitted questions on paper, and I had to answer every question. I astutely answered the question, "To be a successful computing professional, what language should you know best?" with, "The language you speak at home." This got a big round of applause, since it could have been taken as an expression of support for local languages over English, instead of just natural language over computer language. There were many questions relat-

Shmatikov Wins Arts & Sciences Dean's Medal

The Arts and Sciences Dean's Medal is given every year to the most outstanding graduating science student in the College of Arts and Sciences. Last Spring 1994, the medal was given to Vitaly Shmatikov, who double majored in Computer Science and Mathematics.

In addition to holding down a 3.98 GPA he worked in the Math Sciences Computing Center and in Professor Earl Hunt's research laboratory in the Department of Psychology. As a result of working with Hunt's group, Shmatikov did original research which has been written up for a major scientific conference in Europe. In addition to his work with Professor Hunt, he wrote a Senior Thesis under the supervision of Professor Craig Chambers in our department. Vitaly's Senior Thesis dealt with the implementation of type checking in the Cecil language, a new objected oriented language developed by Chambers and his research group.

Hunt said, "Vitaly's contribution has been more like that of a third or fourth year graduate student than an undergraduate." Chambers stated, "He worked largely independently and the quality of his work was strong enough to be the foundation for our later Cecil work." In Professor Ed Lazowska's nomination letter he summarizes, "Vitaly Shmatikov has blown the doors off the University of Washington. In my 17 years here, I have not seen anything like it."

Shmatikov is now a graduate student in computer science at Stanford University.

ing to vector and superscalar computers. At first this surprised me, but then I remembered that Cray had been attempting to sell obsolete machines to India, but was thwarted by US export regulations. This received a tremendous amount of press attention, and has led to India investing heavily in a company building Transputer-based parallel machines.



Michael Rabinovitch, Cathy McCann, Derrick Weathersby, Hellmut Golde, Chandu Thekkath

New Fellowship Honors Outstanding CSE Faculty

The department is pleased to announce plans to establish a new graduate fellowship endowment — the Educators Fellowship Endowment. Each year, a fellowship will be awarded to an outstanding graduate student to honor faculty who have made major and sustained contributions to the department's leadership position — named on a rotating basis from a list drawn up by the department. Emeritus Professor Hellmut Golde, a founder of the department who has guided its evolution over many years, is the single charter designee. Hellmut is perhaps best known for his Pascal compiler work in the late 1970s, royalties from which built the department's endowment in excess of one million dollars. He has been active throughout the years in curriculum development, university affairs and cam-

pus computing policy. [See articles in the Fall '90 and '91 issues of *MSB*.]

The endowment fund has been started with gifts from CSE faculty members and matching funds provided by the University. For the past several years, President Gerberding has matched faculty gifts for fellowships with funds from the President's Fund for Excellence. The program reflects the University's commitment to help departments increase graduate fellowship funds in order to attract top-ranked graduate students.

To date nearly \$50,000 has been contributed to the Educators Fellowship Fund. Alumni and alumnae are invited to contribute to the Endowment. Department chair Ed Lazowska will be happy to answer any questions.

GTE Fellowships for Ten Years

During the past ten years GTE has given the department a total of \$100,000 to be used for graduate fellowships for outstanding students. Clare D. Coxe, Vice President for Public Affairs at GTE, said of the most recent award of \$10,000 given in June 1994, "This contribution reflects our continued support for the Department of Computer Science and Engineering and our commitment to encourage more students to pursue graduate study." This year's award was given to Pai Chou who is doing research with Professor Gaetano Borriello on the Chinook project which is a research CAD tool for embedded systems.

The first GTE fellowship was given in 1985 to Calvin Lin who received his PhD in 1992 and is currently a postdoc in our department, working with Professor Larry Snyder. Other GTE Fellowship holders were Michael Schwartz (1986), Jamie

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Datagrams

Introductory Curriculum Overhauled

Department on the World Wide Web

For more than a year now, department information has been available on the World Wide Web (WWW) site <http://www.cs.washington.edu>. The department home page features a rendition of our famous steam powered Turing machine. A wide variety of information is available at the departmental WWW site.

Best Paper Award

Graduate students Rakesh Sinha and Jayram Thathachar won the Machtey Award for the best student paper at the 35th Annual IEEE Symposium of Foundations of Computer Science, held in Sante Fe, New Mexico in November 1994. Their paper was titled "Efficient Oblivious Branching Programs for Threshold Functions."

Bob Bandes Award

Vivek Ratan received the Bob Bandes Award for the outstanding teaching assistant for the academic year 1993-94.

Intel Fellowship

Mike Feeley was awarded an Intel Fellowship for the the academic year 1994-95. Feeley is working on his PhD dissertation on data management in single address space systems.

Software for Teens

Professor Steve Tanimoto's Mathematics Experiences Through Image Processing (METIP) project is giving away free software targeted at junior and senior high school students. Available for downloading from WWW are "The Pixel Calculator" and "The Image Warper." Either browse from the department home page through "research activities" or go directly to <http://www.cs.washington.edu/research/metip/metip.html>.

Faculty and Students DO-IT

This past summer faculty members Gaetano Borriello and Richard Ladner, and undergraduate Richard Robinson served as instructors for the DO-IT project, an NSF project at the University of Washington for promising high school students who have disabilities. DO-IT stands for Disabilities, Opportunities, Internetworking and Technology. Borriello taught a short course on logic design in which students designed their own circuits using Logic Works. Ladner and Robinson taught a week-long course titled "From the Game of Life to Parallel Image Processing." Students modified a game of life program on a 1,024 processor MasPar MP-1 to do image processing tasks such as fill, connected components, and shadows.

Groundbreaking Event

Ground was broken for the new EE/CSE building on December 7, 1994, in a ceremony held just west of the current EE Building. The project is in two phases to be completed by early 1998. The contract was awarded to Ellis-Don Construction Inc. who is just completing the new Chemistry Building across Rainier Vista from the site of the new EE/CSE building. The cost of construction is \$61,467,935 with the total project cost of \$95,791,000. The graphic on page 1 is the future EE/CSE Building.

Leveson Back at CRA

Professor Nancy Leveson was re-elected to a second term on the Board of the Computing Research Association.

Enthusiastic efforts on the part of a number of faculty and graduate teaching assistants have resulted in a major overhaul of the department's introductory courses: new curricula, new languages, and new use of educational technology.

Beginning in Summer 1994 the introductory courses CSE 142 and CSE 143 started using C and C++ as the vehicle for teaching programming. For the past five years Ada has been used to teach programming and before that Modula-2 and Pascal. CSE 142, Computer Programming for Engineers and Scientists I, will use C to allow the focus of the curriculum to be on the design of modest programs, while its follow-on course CSE 143 will use C++ to allow the curriculum to focus on concepts of modularity and encapsulation.

As stated in the department's course change application for CSE 142: "We are changing the programming language used from Ada to C for several reasons. C has less baggage than Ada, making it easier to focus on basic programming concepts. Programming support tools for C are superior to those available for Ada, lessening the time students spend on problems not related to programming competence." CSE 142, also taught as ENGR 142, is required for students in the College of Engineering.

CSE 143 uses C++ as the natural extension of C which can be used to teach concepts of modularity and encapsulation. In addition, the tools of C++ are useful in many of the project oriented courses later in the Computer Science and Computer Engineering majors. CSE 143 is required for admission into the two majors run by the department.

Professor Larry Ruzzo taught the first "new" CSE 142 in the Summer 1994 Quarter. The course has moved from using Unix workstations to using a laboratory of more than 50 Macintosh computers. Ruzzo brought in several innovations to improve the course. He and his head TA, Anthony LaMarca, used the World Wide Web and Mosaic to interact

Curriculum continued on page 8

Request for News of Alumni Activities

Name: _____ Year of Graduation: _____ Degree Earned: _____

Affiliation: _____

Activities: _____

New Address?

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subsequent papers she has studied the performance of memory management algorithms, synchronization algorithms, load balancing strategies, etc.

This autumn Karlin taught an advanced graduate course on competitive analysis. The course was very well received with a faithful audience of both systems and theory graduate students and faculty. To earn credit in the course graduate students formed small teams with at least one systems and one theory student per team. Each team pursued the design, analysis, and implementation of an on-line algorithm. Karlin has been working closely with Professors Hank Levy and Brian Bershad and several students on research projects in operating systems and architecture.

When Karlin left Palo Alto for Seattle she had to give up more than sunny days, she also had to leave the rock band, Severe Tire Damage, of which she had been a member for several years. Severe Tire Damage has the distinction of being the first band to broadcast live on the Internet

in July 1993. Karlin played the guitar and keyboards in the group and occasionally sang. For more information on the band try the World Wide Web page <http://www.ubiq.com/hypertext/std/band.html>.

Karlin decided to come to Seattle and the department because "The department is fantastic. It is a place that is friendly and warm, and also very strong in research." Thus far, Karlin has not been disappointed. She said recently that her opinion of the department has "quadrupled" since she arrived.

MSB is published semiannually to provide current information on the Department of CSE's diverse activities, and is supported by the Computer Science and Engineering Department Affiliates Program. Volume 8, Number 1 was edited by Richard Ladner and Judy Watson. We thank contributors: Richard Anderson, Ed Lazowska, and Larry Ruzzo; photos and design by Judy Watson; photo of Hellmut Golde and graduate students by Jeff Zaruba; EE/CSE building graphic courtesy of Kallmann McKinnell & Wood Architects.

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Painter (1987), Wen-Hann Wang (1988), Kevin Sullivan (1989), Joan Lawry (1990), Ricardo Pincheira (1991), Dorothy Neville (1992), and Rich Segal (1993).

The long-term generosity of GTE has aided several generations of students in our department. Lin is still grateful for his award given ten years ago. He states, "It was a great honor and a nice way to start my graduate career since it freed me from TA-ing in my first year."

Curriculum continued from page 6

with the class — make announcements and distribute homework, sample programs, solutions to homework and tests, etc. Even lecture transparencies could be reviewed using the Persuasion Player. Professors Larry Ruzzo and Gaetano Borriello taught separate sections of CSE 142 last autumn and continue to refine the course. To view the CSE 142 on the World Wide Web see: <http://www.cs.washington.edu/education/courses/142/>.

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