



Significant

BITS

Newsletter of the
Department of Computer Science

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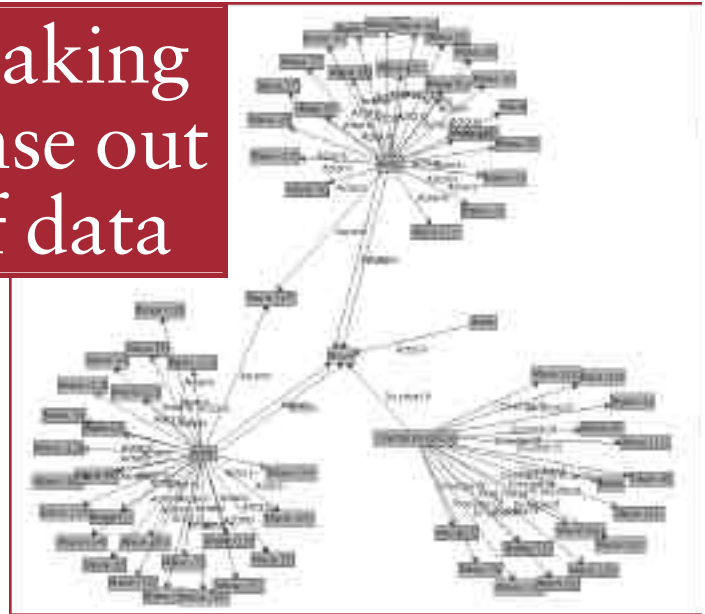
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THE KNOWLEDGE DISCOVERY LABORATORY'S (KDL) expansive name identifies its connection to the booming field of knowledge discovery and data mining. "The field brings together ideas from statistics, artificial intelligence, and databases," says David Jensen, Research Assistant Professor and KDL Director. "We develop algorithms that find previously unknown predictive patterns in large databases." For example, knowledge discovery algorithms have been used to develop new medical diagnostic rules, new ways of detecting credit card fraud, and new filters for automatically screening out email advertisements. Use of these algorithms has grown tremendously in the past decade, with applications in business, government, and science. "Everyone wants to mine their data," notes Jensen.

KDL complements existing Departmental strengths in machine learning and information retrieval and has attracted strong interest from students. It began with two graduate students last year and this Fall grew to six graduate students and four undergraduates. Two of those students are supported jointly with other laboratories in the Department that have allied research interests – the Multi-Agent System Laboratory and the Secure Internet and Group-Networking Laboratory. In addition, KDL works cooperatively with several other groups, including the Experimental Knowledge Systems Laboratory and the Center for Intelligent Information Retrieval.

KDL's current research focuses on relational

Making sense out of data



Devising algorithms that learn statistical models of relational data structures is one goal of KDL's research.

A broad industrial presence

WHILE THERE HAS BEEN MUCH DISCUSSION in the computer science community about industry support for long-term research, the Department has a history of productive relationships with industry that have continued to broaden, even in the current economic slowdown. These relationships are seen in all aspects of the Department – in research, teaching, and outreach activities.

In the 1980's, under the leadership of then chairman W. Richards Adrion, the Department established its Center for Real-Time and Intelligent Complex Computing Systems (CRICCS) which coordinated University and industry research by establishing

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FROM THE CHAIR

By Bruce Croft

SINCE I JOINED THE DEPARTMENT IN 1979, there have been many changes, both on campus and in the world around us. In those days, the Department was a small but energetic group of nine young professors making their reputation in somewhat unusual areas of computer science such as computer vision, machine learning, software engineering, and brain theory (!). Without naming names, Professors Barto, Clarke, Lesser, Riseman, and Wileden were there, as were our more senior colleagues Professors Graham and Spinelli. Through a combination of hard work, risk taking, good hiring and student recruitment, and considerable support from administrators such as Vice Chancellor (formerly Dean) Byron, the Department has prospered and grown into a major teaching and research resource with an international reputation. This history was celebrated at the recent convocation for the official opening of our new building.

The Department does not, however, exist in a vacuum. Events at the University, state, and national levels have a major impact on how we do business. Apart from the obvious emotional distress, the terrorist attacks of September 11 have had significant economic consequences in our State and have even affected the way we do research, in that a number of our faculty have redirected part of their research programs to help the government to combat terrorism. This has happened at a time when the University is going through a number of administrative transitions as we begin the search for a new Chancellor. Although this situation is unique, the Department has been through a number of periods of economic uncertainty and policy change in the past 20 years. By focusing on our core missions of doing leading-edge research, producing highly skilled graduate and undergraduate students, and being active in all aspects of service and outreach, we expect to continue to be a "Center of Excellence" for the Commonwealth.

Along those lines, there have been many accomplishments and positive developments to note since the last issue of *Significant Bits*. Two new faculty members, both already established researchers in their fields, have joined us this year. Associate Professor Sridhar Mahadevan's research is in the area of computational models of learning and sequential decision making. His recent focus has been on machine learning and intelligent agents, especially on learning control strategies via reinforcement learning. This is a very exciting area of computer science and one where we expect he will be able to make seminal contributions in collaboration with UMass faculty such as Professor Barto. Associate Professor Hava Siegelmann's areas of research are broad and reflect the impressive diversity of her contributions. Specifically, she has worked in the areas of neural networks, adaptive and learning algorithms, clustering algorithms, dynamic systems, bioin-

formatics, information retrieval, and data mining. Both of these people are known for their ability to do the type of collaborative research that is characteristic of the UMass environment, and that has recently become very important to the funding agencies.



The other faculty in the Department have continued to be recognized through a number of awards and honors. These research awards, fellowships, and distinguished lectureships are described elsewhere in this issue. It is particularly worth noting that Jim Kurose, the past Chair, gave five distinguished lectures last year and became an ACM Fellow, and Don Towsley was selected to give a Distinguished Faculty Lecture at UMass.

Our research funding increased 24% last year, and included grants from high-visibility programs such as NSF ITR. We continue to work closely with a number of partners in the information technology industry, through the mechanism of research contracts, fellowships, and other arrangements. Marla Michel gives an overview of our industrial interactions in an article in this issue.

Our undergraduate and graduate programs are both booming, with record numbers of highly qualified students applying and being admitted. Many of the undergraduates are getting involved in our research program, to our mutual benefit, and we have run some very successful REU (Research Experience for Undergraduates) programs over the summer. As part of continuing to develop our course offerings, we have worked closely with the University system to develop courses for an IT minor and the new distance learning initiative.

I would also like to acknowledge the contributions of many of our alumni and friends to our fundraising drive. We are still working on a few finishing touches in our building, such as flowerpots (!), and have undertaken a more major project to modify an area near a now-redundant corridor to create a departmental lounge for undergraduate and graduate students, staff, faculty, and visitors. We realized that having such a lounge is an important part of maintaining a sense of community, and we are raising money to make an attractive environment for a range of activities. Contributions targeted towards the lounge will of course be gratefully accepted.

Finally, I want to add my voice to the chorus of tributes for our outgoing Chair, Jim Kurose. Jim did a superb job, and contributed enormously to the spirit and energy of the Department. He will be an extremely hard act to follow, and I hope to discover the secret of his success during my time as Chair. I look forward to working with everyone in the Department and the community at large, and will try to make the next three years another step forward in the Department's record of achievement.

NEWS

Mahadevan joins department faculty

“I’M LOOKING FORWARD TO CARRYING OUT exciting state-of-the-art interdisciplinary research and teaching in Computer Science at UMass – in short, to having a blast,” says Sridhar Mahadevan, who has joined the Department as an Associate Professor and Co-Director of the newly formed Autonomous Learning Laboratory.

Mahadevan’s research interests span several subfields of artificial intelligence and computer science, including machine learning, multi-agent systems, active perception, and mobile robotics.

His research over the past decade has developed a general framework for autonomous learning and sequential decision-making. This framework models autonomous behavior using three central components: time (when should agents make decisions), value (for ranking actions to achieve a desired goal), and memory (how to selectively use the past in deciding what to do). This framework provides a broad set of principles for designing agents that act autonomously in complex environments to achieve long-term goals. “The challenge,” says Mahadevan, “is how to learn to act rationally in real-time from a noisy stream of perceptions and despite uncertainty in outcomes.” The framework also provides a theoretical basis for understanding cognitive behavior in biological systems from insects to humans.

Mahadevan’s recent research has focused on multi-scale statistical temporal processes, including hierarchical hidden Markov models, semi-Markov decision processes, and hierarchical partially observable Markov decision processes. His research encompasses fundamental theoretical advances on algorithms for learning and using these models, as well as real-world applications. The applications range from mobile robot navigation in large indoor environments to an active vision system for finding objects in cluttered rooms, to coordination among teams of factory agents optimizing production control.

Before joining UMass, Mahadevan was an Associate Professor at Michigan State University’s (MSU) Department of Computer Science and Engineering. He received his Ph.D. in Computer Science from Rutgers University. He worked in the private sector

at the IBM T.J. Watson Research Center, where he co-authored a pioneering book on robot learning. Mahadevan then joined the faculty at the University of South Florida where he received a five-year NSF Faculty Early Development (CAREER) Award, in the first year that NSF instituted this program.

At MSU, Mahadevan received the Withrow Distinguished Scholar award for his research, and the university-wide Teacher-Scholar award in recognition of his teaching and scholarship. He was one of the principal founders of the cognitive science program, and worked closely with psychologists and biologists supported through an NSF Knowledge & Distributed Intelligence (KDI) grant.

In addition to his research effort, Mahadevan is the Associate Editor of the *Machine Learning Journal* and the *Journal of Machine Learning Research*, two leading journals in the field. From 1997 to 2000, he was on the editorial board of the *International Journal of Artificial Intelligence Research* (JAIR).

He greatly enjoys working with graduate and undergraduate students. One of his undergraduate research students at MSU, Natalia Hernandez, won the 2000 CRA award for most outstanding female undergraduate CS student. In May 2001, a paper co-authored by Mahadevan with two of his graduate students, Rajbala Makar and Mohammad Ghavamzadeh, won the Best Student Paper award at the Fifth International Conference on Autonomous Agents.

“UMass has an outstanding Department for research and teaching in artificial intelligence, recognized as being in the top five in the U.S.,” says Mahadevan. “It has an enviable track record of producing high-quality students in AI, who have since gone on to become leaders in the field.” On a more whimsical note, he adds: “I had the opportunity to interview at UMass in 1993, but declined it since I had already accepted another offer. After eight years, I’m back again, and it does feel like this was meant to be.”



Stephen Long

Osterweil appointed NSM dean

CS PROFESSOR LEE OSTERWEIL has been named interim Dean of the College of Natural Sciences and Mathematics. Osterweil succeeds Robert Hallock, who had been interim Dean since last September. “I am delighted to have this chance to lead the college’s outstanding faculty

as it continues its highly successful pursuit of a dazzling array of exciting opportunities in science,” says Osterweil. “The college is uniquely positioned to shepherd the great scientific discoveries of the next generation.”

Osterweil is co-Director of the Laboratory for Advanced

Software Engineering Research (LASER) and the Electronic Enterprise Institute (EEI). Osterweil joined the Department as Professor in 1993, arriving from the University of California, Irvine, where he chaired the Information and Computer Science Department.



RESEARCH

Sense (from page 1)

knowledge discovery – constructing useful statistical models from data about complex relationships among people, places, things, and events. This work diverges from traditional approaches to knowledge discovery that assume data instances are structurally identical and statistically independent. New developments in this area are vital because of the growing interest in mining huge data sets drawn from the Web, telecommunications networks, relational databases, object-oriented databases, and other sources of structured and semi-structured data. Potential applications of KDL's work include detecting fraud, explaining the behavior of complex networked computer systems,



tracking the spread of disease, and understanding the content of news stories.

This research focus grew out of Jensen's prior work. After completing his doctorate at Washington University in 1991, Jensen joined the Office of Technology Assessment (OTA), an analytical support agency of the U.S. Congress. "We did long-term studies of science and technology issues for Congress," Jensen explains, "because understanding many of today's public policy issues requires technical expertise."

While at OTA, Jensen completed a study of how data mining techniques could be used

to detect money laundering. One of the primary findings of the study was that then-current knowledge discovery techniques were inadequate to the task. "The fascinating thing about money laundering investigations is that no single piece of evidence is indicative," notes Jensen. "Only a complex, interconnected web of evidence reveals the crime." The best techniques at the time could not effectively learn rules that captured such complex relational patterns.

After he joined the UMass faculty in 1995, the technical challenges raised in the OTA study continued to intrigue Jensen. With colleagues from industry and academia, he organized two technical workshops with support from the American Association for Artificial Intelligence (AAAI): the 1998 AAAI Fall Symposium

on Artificial Intelligence and Link Analysis and the AAAI 2000 Workshop on Learning Statistical Models from Relational Data. Both workshops explored the technical issues of learning from relational data.

From there, it was a short step to creating a new laboratory in Fall 2000. Jensen notes that creating the lab was a way to focus attention and resources on this research topic. "It meant we could provide a better collaborative environment for students interested in this area, and attract more research support for our work." Jensen credits the supportive environment at UMass for making it possible. "Everyone in the Department has been incredibly supportive," he says, "it's one of the things that makes this Department such an innovative and vibrant place."

For more information, see <http://kdl.cs.umass.edu>.

INDUSTRY

Sitaraman puts theory into practice

HOW DOES A COMPUTER SCIENCE THEORIST become part of a commercial startup venture? In retrospect, the answer is quite simple: work on the right research problems, and, when the time is ripe, apply these ideas to the marketplace. When Associate Professor Ramesh Sitaraman took a leave of absence from the Department to join a venture started by his friends and research colleagues, he felt that the time was indeed ripe.

Sitaraman joined the Department in 1993 after receiving his Ph.D. from Princeton University. His research focuses on fundamental theoretical issues in the design and use of parallel and distributed systems, and communication networks. He is Co-Director of the Theoretical Aspects of Parallel and Distributed Systems Laboratory and a member of the Theory Group. Nominated three times for the distinguished teaching award, he was comfortable in academia.

Research relationships with colleagues at MIT are nothing new for Department faculty. Sitaraman and Tom Leighton, of MIT's Laboratory for Computer Science knew each other well and had collaborated in parallel algorithms research. When Leighton, working with one of his graduate students, Daniel Lewin, developed a set of algorithms that could improve upon the way content and applications were delivered on the Internet, the idea for Akamai was born. The two MIT researchers founded Akamai in September 1998. The following summer, a few months after the first product was launched, Sitaraman was invited to join Akamai.

Sitaraman did whatever was needed in the early days, from engineering products to interfacing with customers. "We worked many hours per day," recalls Sitaraman with a smile. "It was intense." Over the last year and a half, Sitaraman has been working more on the design of new products and services. He has been architecting Akamai's next-generation networks for delivering high-quality streaming media on the Internet. Akamai's streaming network is perhaps the largest in the world, delivering several gigabits of streaming data per second.

"It is exciting to be able to tell the world that pure research has applicability down the road," Sitaraman reflects. Commenting on the difference between industry and academia, he continues. "It's very gratifying to be able to architect a novel system and then see millions of people using it within a short amount of time." Akamai's product development life cycle needs to be short because the market changes so quickly. "But, at a company like Akamai, you don't have a chance to study all the questions you'd like in depth. It's the difference between being product driven and curiosity driven."

Sitaraman is an academic at heart. His goal in life is to be able to discover new interesting things. "I always wanted to do science, and I miss teaching a great deal," says Sitaraman, who plans to return to the University. "The greatest value from my Akamai experience is that it has provided me with lots of interesting ideas for research and teaching," he added.

AWARDS

Kurose named ACM fellow

PROFESSOR JIM KUROSE has been named a fellow of the Association for Computing Machinery (ACM). Kurose was recognized with this prestigious honor for making pioneering and sustained contributions to the design and analysis of network protocols and architectures for supporting real-time communication and for his technical leadership in the field.

“This is a fitting honor for Jim,” said Department Chair Bruce Croft. “He has earned this distinction through his outstanding record of research achievement that has continued throughout his tenure as Chair. He is indeed one of the best in his field.”

Kurose’s research interests are in the areas of computer networks, network and operating system support for servers, and modeling and performance evaluation. He received his Ph.D. in Computer Science from Columbia University and joined the UMass CS faculty in 1984. He co-directs the Computer Networks Laboratory. Kurose was named as Fellow of the IEEE in 1995. He joins previously named ACM Fellows Krithi Ramamritham, Donald Towsley, Arnold Rosenberg, Leon Osterweil, Lori Clarke, W. Bruce Croft, and W. Richards Adrion.

The ACM is the oldest and largest society for computing and technology professionals worldwide. The ACM Fellows



Program was established in 1993 to recognize and honor outstanding ACM members for their achievements in computer science and information technology

and for their significant contributions to the mission of the ACM. Kurose will be inducted at an awards banquet on April 27, 2002 in Toronto, Canada.

Shenoy named Lilly Teaching Fellow

ASSISTANT PROFESSOR PRASHANT SHENOY has been named a University of Massachusetts Lilly Teaching Fellow for the 2001-2002 academic year.

This competitive award program, established in 1986, enables promising junior faculty to cultivate teaching excellence. A special year-long collaboration with the Center For Teaching (CFT) on individual projects typically involves developing or re-

designing a course. Shenoy’s Lilly project will be to modernize the undergraduate operating systems course by developing a hands-on laboratory component.

Previous Lilly Teaching Fellows in the Department include James Allan (1999-2000), Ramesh Sitaraman (1996-1997), David Mix Barrington (1994-1995), Jim Kurose (1993-1994), and Eliot Moss (1991-1992).

Adrion and Croft receive NSM faculty awards

AT THE UMASS COLLEGE OF NATURAL SCIENCE AND MATHEMATICS (NSM) fall convocation, Professor Rick Adrion received the outstanding faculty award for service and Distinguished University Professor Bruce Croft received the outstanding faculty award for research.

According to NSM Associate Dean Mary E. Musgrave, “the outstanding faculty awards for research and service were newly implemented this year to accompany the longer-running outstanding teaching awards, to emphasize and celebrate these aspects of excellence in our faculty.” Departments make nominations for these awards and the selections are made by a college-wide committee appointed by the NSM Dean.

Adrion’s significant and long-term contributions to the U.S. scientific community include leadership in the development of the Internet, in setting important directions of the National Science Foundation, and in developing a stronger political voice for computer science in national politics, in addition to playing a vital service role to his own software engineering research community.

Croft was nominated for his sustained record of outstanding research achievements, technology transfer efforts, and leadership in the technical community over a career of more than two decades at UMass where he garnered an international reputation as a preeminent leader in the field of information retrieval.

Strong presence of fellows

FOUR OF THE DEPARTMENT’S new graduate students arrived this fall with fellowships in hand. They include:

- Laylaa Ali - Wellfleet Fellowship (departmental)
- Allison Clayton - National Physical Sciences Fellowship
- Vanessa Gaudin - University Graduate Fellowship and AT&T Fellowship
- Jiwoon Jeon - Korean Government Fellowship

Our current students also hold an impressive number of fellowships, including:

- Dan Bernstein - NASA Fellowship - Graduate Student Researchers Program
- Jamieson Cobleigh - Wellfleet Fellowship (departmental)
- Kat Hanna - NSF Graduate Research Fellowship
- Bill Hesse - University Graduate Fellowship
- Dimitri Lisin - Kodak Fellowship
- Amy McGovern - National Physical Sciences Fellowship
- Jennifer Neville - NSF Graduate Research Fellowship and AT&T Fellowship
- Mike Rosenstein - NASA Fellowship, Graduate Student Researchers Program
- Alicia Peregrin Wolfe - National Physical Sciences Fellowship

A broad industrial presence (from page 1)

projects, laboratories, and centers to support both basic scientific research and focused projects. In 1992, with funding from the National Science Foundation (NSF) to launch a State/Industry/University Cooperative Research Center (S/IUCRC), the Center for Intelligent Information Retrieval (CIIR) was established. As an S/IUCRC, the CIIR needed to obtain industry support equal to that which it received from the NSF and the Commonwealth of Massachusetts. The CIIR has become one of the leading information retrieval research labs in the world. Over the years, it has attracted more than eighty member companies.

More recently, regional and national companies have increased their presence on campus. Attracted by the Department's research and the quality of its students – undergraduate and graduate – companies such as EMC, Fidelity, IBM, Intel, Kodak, Lucent, Microsoft, Sprint, and Sun are providing support. "We were drawn to UMass Amherst because it is a strong Tier 1 research institution in the areas of interest to Microsoft and has a solid student base," remarks Scott Williams, university program manager for Microsoft Research. Microsoft recently selected UMass Amherst as one of four schools nationwide for its Microsoft Developer Network Academic Alliance (MSDN-AA) program. The MSDN-AA is only one part of a multi-faceted relationship

with the campus.

When there is a research topic of mutual interest, industrial research labs often support the academic research labs. For example, Sun Microsystems recently made a significant equipment donation to the Multi-Agent Systems Laboratory led by Professor Victor Lesser. Sprint's Advanced



(left to right) Jim Kurose with this year's Microsoft Scholars Jeffrey Stylos, Srivinas Turaga, and Thomas Armstrong, and Microsoft's Scott Williams

Networking Laboratory has been a long-time collaborator with the Computer Networks Research Laboratory, co-led by Professors Jim Kurose and Don Towsley. This latter relationship has recently expanded to include the Laboratory for Advanced System Software, directed by Assistant Professor Prashant Shenoy, and the Secure Internet and Group Networking Laboratory, directed by Assistant Professor Brian Levine.

The University Partnership Program of IBM's T.J. Watson Research Laboratory has given Faculty Partnership Awards for the coming year to Lori Clarke, to Shenoy and to Towsley. EMC Corp., with its interest in

multimedia delivery architectures, has also supported Shenoy's research.

In addition to working with the Department on mutual research interests, companies are expanding their support of graduate and undergraduate students. In 2000, Fidelity Investments established the Fidelity Scholars Program. This

program, specifically designed to encourage top technical students to consider a career at Fidelity, has been successful in awarding dozens of fellowships to undergraduate computer science, electrical engineering, and computer engineering students in the UMass system. To date, ten Amherst Computer Science students have received these renewable awards. Fidelity is also a member of the Department's Industrial Affiliates' Program which further encourages the research interactions.

Similarly, Microsoft recently created the Microsoft Scholars Program. These merit-based scholarships are given to three graduates and are renewable subject to good academic performance. Scholarships are also provided to students studying electrical and computer engineering. On the graduate side, Kodak recently awarded a four-year research fellowship to a student in the Vision Laboratory. Dimitri Lisin, a second-year graduate student, is interested in 3D image processing and computer vision. Under the direction of Professors Allen Hanson and Edward Riseman, Lisin will continue his work on a medical imaging project for 3D segmentation of stroke lesion images in MRI data. This project is a collaboration with Baystate Medical Center in Springfield, MA.

Equipment and software donations allow the students to become familiar with the environments that they will encounter in the workforce. The Department has been fortunate to have several companies such as Informix, Intel, and Microsoft contribute hardware and software to our research and education labs.

The mutual benefits of industrial partnerships are clear. The Department is committed to working with industry on a number of fronts to further our research and teaching goals, and to provide opportunities for our students. Company representatives interested in learning more about the Department should contact Jean Joyce (jean@cs.umass.edu).

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A toast to Kurose

THE DEPARTMENT SURPRISED PROFESSOR JIM KUROSE with a celebration to thank him for all of his contributions during his three-year term as Chair of the Department of Computer Science. Distinguished University Professor Army Rosenberg hosted the event which was attended by Kurose's wife Julie and their children, various UMass administrators, members of the state legislature, NSM department heads and chairs, former CS Department chairs, and current faculty, staff, and students. The many speakers commended Kurose for his tireless efforts as Department Chair.



Alum Matters

A newsletter for alumni of the Department of Computer Science

A real-time reunion

PROFESSOR KRITHI RAMAMRITHAM, his wife Ranjani, and their children Roopa and Rajiv got together this May with current students and past graduates from his Database Systems Laboratory, Real-Time Systems Laboratory, and Real-Time Databases Laboratory. The reunion, celebrating Ramamritham's 20 years at UMass and his election as an ACM Fellow, was organized by graduate student Cris Pedregal Martin. Fourteen of the 18 Ph.D. students who Ramamritham advised attended the event, along with families of many of the alumni. They gathered at Professor Ramamritham's favorite restaurant, Amherst Chinese, for lunch, and presented Ramamritham with a commemorative plaque and an engraved Handspring Visor.

In addition to sightseeing around Amherst, they met at UMass for a tour of the new CS building, demonstrations, tea, and friendly conversation. Many also gathered for dinner in the evening. In a more formal part of the event, Panos K. Chrysanthis (Ph.D. '91) and Wei Zhao (Ph.D. '86) presented research talks.

"It was wonderful to be together with many of my former students and their families, some of whom I hadn't seen in years. My family was also thrilled to be with old friends again," says Ramamritham. "We were touched by the fact that most of them had come to town just for this event." Ramamritham also remarked that the day brought back memories of long and intense hours spent with these remarkable people, slogging away on papers, and burning the midnight oil.



(left to right) Wei Zhao, Huan Li, Meghana Arvind, K. Arvind, (Raju) Rajendran Sivasankaran, Cris Pedregal Martin, Panos K. Chrysanthis, Oscar Gonzalez (kneeling), Ming Xiong, (Badri) B.R. Badrinath, Krithi Ramamritham

Ramamritham's current and former students who attended the reunion include:

- ♦ K. Arvind (Ph.D. '91), Founding and Consulting Engineer, Tenor Networks, Acton, MA
- ♦ B. R. Badrinath (Ph.D. '89), Professor, Department of Computer Science, Rutgers University, NJ
- ♦ Panos Chrysanthis (Ph.D. '91), Professor, Department of Computer Science, University of Pittsburgh, PA
- ♦ Oscar Gonzalez (Ph.D. '00), Member Technical Staff, Bell Laboratories, Murray Hill, NJ
- ♦ Mohan Kamath (Ph.D. '97), Engineering Manager, Noosh Inc., CA
- ♦ Huan Li (current graduate student)
- ♦ Cris Pedregal Martin (current graduate student), Professor, University of New Mexico (January '02)
- ♦ Chia Shen (Ph.D. '92), Senior Research Scientist and Associate Director, Mitsubishi Electric Research Labs, Cambridge, MA
- ♦ Lory Molesky (Ph.D. '96), Senior

- Researcher, Oracle Corp., Nashua, NH
- ♦ H Shrikumar (current graduate student)
- ♦ Rajendran (Raju) Sivasankaran, (former graduate student), Founder and CTO, Knumi, Inc., Cambridge, MA
- ♦ Fuxing (Fred) Wang (Ph.D. '93), Founder and COO, Primeon, Inc., Stoneham, MA
- ♦ Ming Xiong (Ph.D. '00), Member Technical Staff, Bell Laboratories, Murray Hill, NJ
- ♦ Wei Zhao (Ph.D. '86), Professor, Department of Computer Science and Associate Vice President for Research, Texas A&M University, College Station, TX

"Even though it was a short period of time (in most cases!) that we spent working closely, a sense of extended family had developed over the years and this special event reinforced it beyond measure," says Professor Ramamritham. "We are all looking forward to the next reunion already."

Bits & Bytes

Thank you to all who so generously gave to the Department of Computer Science. For a recent list of who you generous people are, please see the back page of this issue of *Significant Bits*.

Direct line to students

Alumni: This is your chance to have direct access to the undergraduate and graduate students of the Computer Science Department. Once a month a mail message is sent out to all undergraduate and graduate students informing them of opportunities for jobs, scholarships, internships, and other academically directed programs. We will collect your notices and send them directly to the students. Send your notices to alumni@cs.umass.edu.



Alumni Association

The UMass Alumni Association

provides a connection between alumni, faculty, friends, and the University. Stay connected by becoming an Alumni Association Member. **Membership matters.**
800-456-UMASS (8627)
zMinutemen.com

Suthers receives NSF CAREER Award

UNIVERSITY OF HAWAII ASSISTANT PROFESSOR DANIEL SUTHERS (PH.D. '93) of the Information Computer Science (ICS) Department received the National Science Foundation (NSF) CAREER award for his proposal "Collaborative Representations: Supporting Online Knowledge-Building Discourse."

Suthers is interested in improving the quality of software available for online learning, both at K-13 and university levels. "I am focusing on providing better support for knowledge-building discourse, the interactions between learners and their mentors by which they arrive at an understanding of a topic of study," says Suthers. While a student at UMass, Suthers' advisors were Professor Edwina Rissland and Research Associate Professor Beverly Woolf.

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards for new faculty members. The CAREER program recognizes and supports the early career-development activities of those teacher-scholars who are most likely to become the academic leaders of the 21st century. Awards range from \$200,000 to \$500,000 and are in duration from four to five years.



Alumni Connections

Panos Chrysanthis (Ph.D. '91) has been appointed an editor of *The VLDB Journal* (The International Journal on Very Large Data Bases) for a six year term.

Since spring '99, **John Greene** (BS '93), has been at BEA Systems WebLogic division in San Francisco, CA. Recently, he changed positions within BEA to Backline Interface Engineering Manager. At the new position, he is the interface for worldwide backline support into both engineering and product management. In addition, he will be writing a monthly column for the new Sys-Con publication *WebLogic Developer's Journal*.

Alumni Connections needs updates!

Calling all alumni: Let us know where you are! We'll publish a list of where you are living and working these days so you can keep in touch with each other. Send email to alumni@cs.umass.edu or complete the form on the back of this issue. Thanks!

In addition to her position as Senior Research Scientist, **Chia Shen** (Ph.D. '92) has taken on the added responsibility as Associate Director of Mitsubishi Electric Research Labs (MERL-CRL).

Where have they gone?

THE DEPARTMENT IS PROUD to have graduated fourteen students with Ph.D.s over the past year.

- Lisa Ballesteros: dissertation topic “Resolving Ambiguity for Cross-language Retrieval: A Dictionary Approach” (Bruce Croft, Advisor); Clare Booth Luce Assistant Professor of Computer Science at Mt. Holyoke College.
- Jefferson Coelho: “Multifingered Grasping: Grasp Reflexes and Control Context” (Rod Grupen, Advisor); Software Design Engineer at Agilent Technologies.
- Madirakshi Das: “Some Studies in the Use of Color for Image Indexing and Retrieval in Specialized Databases” (Ed Riseman, Advisor); Senior Research Scientist, Imaging Science Research and Development at Eastman Kodak, Rochester, NY.
- Oscar J. Gonzalez Gomez: “Building Distributed Real-Time Systems with Commercial-off-the-Shelf Components” (Krithi Ramamritham, Advisor); Member of Technical Staff at Lucent Technologies- Bell Labs.
- Manfred Huber: “A Hybrid Architecture for Adaptive Robot Control” (Rod Grupen, Advisor); Assistant Professor at University of Texas.
- Anton Leuski: “Interactive Information Organization: Techniques and Evaluation” (James Allan, Advisor); Senior Research Fellow at UMass Center for Intelligent Information Retrieval (CIIR).
- James (Tim) Oates: “Grounding Knowledge in Sensors: Unsupervised Learning for Language and Planning” (Paul Cohen, Advisor); Assistant Professor, Computer Science/Electrical Engineering, University of Maryland, Baltimore County.
- Jitendra D. Padhye: “Model-Based Approach to Top-Friendly Congestion Control” (Jim Kurose and Don Towsley, Advisors); Research Scientist at AT&T Center for Internet Research at ICSI.
- Justus H. Piater: “Visual Feature Learning” (Rod Grupen, Advisor); Research Scientist at INRIA.
- Daniel S. Rubenstein: “End-to-End Support for Large Scale, Continuous Media Sessions Over Best-Effort Networks” (Jim Kurose and Don Towsley, Advisors); Assistant Professor at Columbia University.
- Sambit Sahu: “Network and End-host Support for Heterogeneous Services in the Internet” (Jim Kurose and Don Towsley, Advisors); Research Staff Member at IBM-Thomas J. Watson Research Center, Internet Technologies Division.
- Subhabrata Sen: “Server and Proxy Services for Efficient Streaming Media Delivery over the Internet” (Don Towsley, Advisor); Senior Technical Staff Member at AT&T Labs - Research.
- Mia Stern: “Using Adaptive Hypermedia and Machine Learning to Create Intelligent Web-based Courses” (Bev Woolf, Advisor); Post Doctoral Researcher at IBM Research.
- Xiaoguang Wang: “Model Reconstruction and Refinement Using Multiple Aerial Images” (Al Hanson, Advisor); Senior Software Engineer at Cognex Corporation.

Your own chair in our building

HAVE YOU EVER WANTED TO SAY that there is a chair named after you in the UMass Computer Science Building? Well, now is your chance. While it won't be an endowed Chair of the Department (though that too is an option with your generous donation), it could be a real chair that gets used every day by faculty, staff, and students. Or maybe you'd like to say that you were responsible for the dining pleasures of our students who use the refrigerator and microwave for meals and midnight snacks.

The Department is in the midst of room renovations to build a departmental lounge for everyone to use. We are well on the way to having the funds for the construction of the lounge, but we still need to furnish the room and provide necessities like a refrigerator and microwave. With your contributions, we can build a gathering place for all to enjoy. When you visit the Department, you can see first hand where your contributions have gone and how they benefit everyone, especially our students. We have provided an envelope for your contribution to go directly the Department, ensuring that the funds go towards the Campaign for Computer Science. You can specify “lounge fund” on the envelope if you want your contributions to go directly to the lounge renovations.

The Department is a great place to be right now. Your support, in whatever form you choose, continues to make it an even better place. Thank you!

Barrett's bestseller

DANIEL J. BARRETT (PH.D. '98) published his third computer book, *SSH, the Secure Shell: The Definitive Guide* with O'Reilly & Associates. Co-authored with Richard Silverman, the book covers internals and applications of SSH, the popular network security protocol. “The book entered the Top 100 Bestsellers list at amazon.com upon publication, duking it out with John Grisham and Harry Potter,” says Barrett. He and his family live in Boston, where he is a software project manager for Merrill Lynch, creating applications for Merrill Lynch Direct (www.mldirect.ml.com). He can be reached at dbarrett@blazemonger.com.

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CENTERS

CCBIT brings Old Deerfield history collection online

THE CENTER FOR COMPUTER-BASED INSTRUCTIONAL TECHNOLOGY (CCBIT) helped to develop a web site to put the Memorial Hall Museum's history collections online. The web site, "American Centuries: View from New England," focuses on the region at three turns of the century. The site also includes extensive history curricula de-

signed by local teachers from the Frontier Regional School District, and provides an interactive look at much of the collection of the Deerfield, Massachusetts museum, part of the Pocumtuck Valley Memorial Association.

"The site offers features that are seldom combined in a history or museum web site," says David Hart, Executive Director of the CCBIT. "Programming was intensive and took more than three years. The site creates pages on-the-fly using dynamic database technology, which makes the site distinctive and technically sophisticated." It offers several interactive activities which provide students and visitors with experience in using primary resources. These include "Dress Up," which details the clothing of an 18th-century woman, "Now Read This," which challenges the user to try reading old documents, and "Scavenger Hunt," which sets the user on a search for specific items in the museum's digital collection.

The project relies on items from the museum's collection to provide a window on the past. Students can learn about family life, child life, gender roles, work, and education at the turns of three centuries, 1700, 1800, and 1900. Approximately 1,250 items of the 30,000 items in the collection are included on the site located at <http://www.memorialhall.mass.edu>.

The principal sponsor of the project is the National Endowment for the Humanities, with additional funding from the Massachusetts Cultural Council, the Massachusetts Foundation for the Humanities, the Institute of Museum and Library Sciences, the Massachusetts Department of Education, the National Historical Society, Bell Atlantic, the Five College Multi-Media Access Project, and several offices within the University.

Electronic Enterprise Institute tackles digital government and process modeling

THE ELECTRONIC ENTERPRISE INSTITUTE (EEI) at the University of Massachusetts Amherst has welcomed Dr. Norman Sondheimer as its new Co-Director. Along with Co-Director Dr. Lee Osterweil, Professor of Computer Science and Dean of the College of Natural Sciences and Mathematics, the EEI is poised to capitalize on one of the underlying motivators of Computer Science – reducing the time and cost of carrying out basic operational processes.

The EEI has always viewed the Internet phenomenon as an inclusive, interdisciplinary endeavor. Internet technology supports this in practice; it makes it possible for more people and distinct organizations to communicate faster and cheaper than ever before. In an effort to maximize the return on investment for the technology, businesses in the public and private sectors have spent time and resources automating existing processes and defining new value-added processes. The EEI believes that the key to success of these businesses is finding the right processes to automate.

The EEI sees government processes as a test case for electronic enterprise success. "If the Internet can make our governments easy to deal with, then it can help anywhere," says Sondheimer. The Commonwealth, in harnessing the energy of the Internet

Revolution, wants round the clock service to all of its constituents – businesses, citizens, employees, and other governmental agencies. The essential core of this transformation is to change state service processes from a vertical, isolated, agency-based structure, to a horizontal, fully integrated task-based structure. This massive change will introduce more new processes in a shorter time than ever before. These processes must respect existing jurisdictions, maintain privacy, integrate disparate databases, and produce a consistent intuitive interface. "This project is ideal for the EEI," notes Sondheimer.

Under support from the Commonwealth, the EEI is leading a UMass team with Professor Charlie Schweik, of the Center for Public Policy and Administration, to help make the transformation succeed. UMass is part of the initial team designing the new processes to support the portal. Using the work process and workflow research from the Computer Science Laboratory for Advanced Software Engineering Research (LASER), students from Computer Science, Management, and Public Administration are working with the "Licensing and Permit" project within the State Department of Consumer Affairs.

Additional information about the EEI and this project can be obtained at <http://eei.umass.edu>.



Dr. Norman Sondheimer, left, with co-director Dr. Lee Osterweil

Undergraduates and research – a natural combination

UNDERGRADUATES have made significant contributions to the Department's research mission for many years. Efforts to involve undergraduates in research have gotten a boost in recent years from a unique federal program. In the Research Experience for Undergraduates (REU) Program, supported by the National Science Foundation, students work on major research projects with faculty and staff researchers who serve as their mentors.

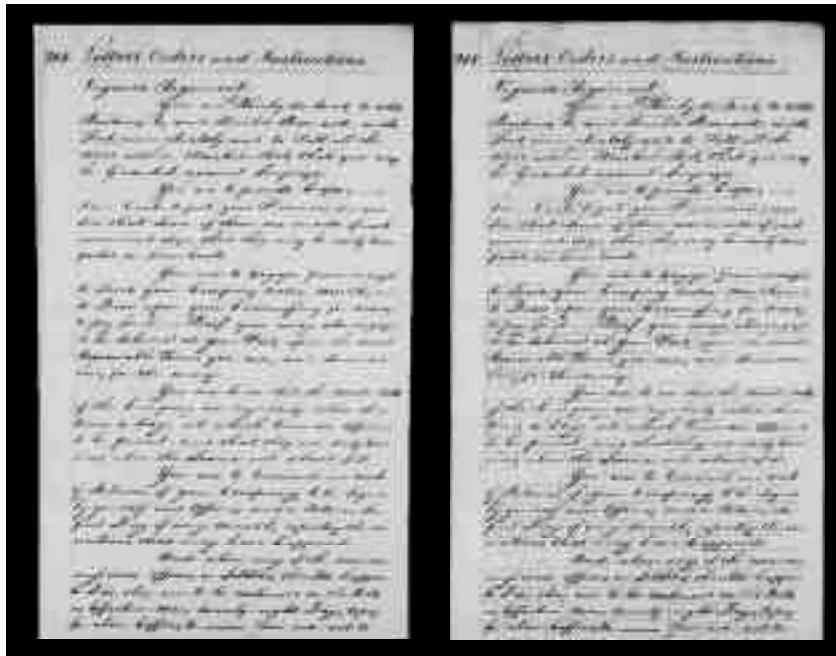
This year, three laboratories have supported REU students:

The Center for Intelligent Information Retrieval (CIIR) ran its third annual summer REU program for students from around the country. The CIIR hosted three research groups working on question answering using semi-structured data, topic detection and tracking, and word spotting techniques.

The goal of the question answering using semi-structured data project was to build a retrieval system that would give specific answers to statistical questions, instead of retrieving a document in which a user must search for the answer. Michael Branstein (Xavier University), Ryan Coleman (Marietta College), and Matthew King (UMass) assisted in the design of a question answering system for statistical data using the structure of web pages. The students developed a platform for testing the system and learned to build a web crawler. They used HTML structure to separate content documents from non-content documents and to section documents for answer retrieval, and wrote programs that reformat both HTML and text tables to associate metadata with data.

A topic detection and tracking research project focused on using statistical language modeling techniques to improve the effectiveness of a task called story link detection (SLD). SLD requires that a system decide whether two randomly selected stories discuss the same news topic. The students, Edward De Guzman (Rutgers University), Daniel LaFlamme (UMass), Veera Pollard (Wellesley College), and Steve Thomas (Amherst College) implemented substantial enhancements over methods tried in the past. The group developed an improved language modeling approach that uses ideas from relevance modeling to build better models, then compares models to each other instead of comparing stories to models. The REU work is expected to become the core of a conference submission.

The REU team studying word spotting techniques consisted of Shaun Kane (UMass), Andrew Lehman (Rose-Hulman Institute of



A handwritten manuscript from George Washington's collection (left) is automatically segmented (right) using a word spotting algorithm to create a searchable text index based on the words contained in the document.

Technology), and Elizabeth Partridge (University of Virginia). “Word spotting” is the process of creating a searchable text index based on the words contained within a document. This is accomplished by creating classes of word images, where each class consists of multiple instances of the same word. The team applied word spotting to index George Washington's handwritten manuscripts. The students investigated different image matching techniques for this task and built a demonstration system to illustrate how the matching could be used to create an index for the manuscripts.

The Autonomous Learning Laboratory (ALL) hosted four REU

projects. Student David Whitehead is developing a neural model of visual and tactile fusion in the parietal and premotor cortices. Neurons in the premotor cortex are involved in the generation of reaching movements. Through inputs from the parietal cortex, these neurons also respond to corresponding visual and tactile stimuli, enabling a subject to react to an object whether he sees it or feels it touch him. David is working on a model of associative learning in an effort to explain the development of this mapping.

Undergraduate Peter Amstutz is working on a mobile virtual/augmented reality interface for wearable computers. This ALL project aims to develop a distributed object system that facilitates the presentation of three-dimensional, collaborative, virtual environments. The group is working to render these environments in real time on a wearable computer, allowing a user to access the virtual environment from any location in real space. It utilizes a head tracking system to move the viewpoint within the virtual world, thus creating an illusion of the user's movement within the virtual space. Orientation in the head tracking system is derived from a gyroscope; position is derived from GPS or through cameras located within a smart room.

Audio spatialization for wearable computers is the ALL research project of Michael Piantedosi. Humans are able to process multiple sound sources simultaneously – so long as the individual sources are distributed spatially. Piantedosi is part of a research team that is developing techniques to have a wearable computer artificially project a sound to an arbitrary location in space. This will enable multiple agents (e.g., news and email readers, or juke box players) to present audio information to the user at the same time. The user need only shift attention to one of the available sources in order to absorb its full informational content. – *continued*

BOOKSHELF

Weems' books keep stacking up

ASSOCIATE PROFESSOR CHIP WEEMS CONTINUES TO PUBLISH NEW BOOKS, three in the past year and more planned for next year. Weems co-directs the Architecture and Language Implementation Group, and his research interests include computer architecture, parallel and associative architectures, heterogeneous and configurable parallel architectures and their compilers, and integration of compile-time and run-time information in high-performance microprocessors.

Introduction to Java and Software Design, a collaboration of Nell Dale, Chip Weems, and Mark Headington, was released in January 2001. This book breaks the current paradigms for teaching Java and object-oriented programming. It has been developed from the ground up to be a Java text, rather than a Java translation of prior works.

After writing fourteen introductory programming texts, Weems is pleased to be involved with the Java version of Nell Dale's data structures text. *Object-Oriented Data Structures*

Using Java, by Nell Dale, Daniel Joyce, and Chip Weems, teaches the classic data structures with a modern software engineering approach. "The challenges in adapting the data structures material to the object-oriented paradigm were quite interesting," says Weems. "In some ways, object orientation makes the teaching of data structures easier, but at the same time it introduces new instructional hurdles to overcome." Weems also enjoyed working with Dan Joyce from Villanova, a new member of their writing team, as he brought many fresh ideas to the mix.

Weems' fifteenth introductory programming text, *Programming and Problem Solving with C++*, by Nell Dale, Chip Weems, and Mark Headington, is the third edition of the popular C++ book. "While C++ is more of a mix of procedural and object-oriented language features, some of our cutting-edge pedagogical work on the Java programming text has been able to migrate into this new edition," says Weems. The book is due to be released in December.

Yet another book is due to be released in February 2002. *Introduction to Visual Basic and Software Design* will bring the instructional approach of the Java programming book



to Visual Basic 7 for Microsoft's new .NET environment.

After completing all of these books, what's next for Weems? He and his collaborators are planning a second edition of *Introduction to Java and Software Design*. The C# language from Microsoft is another possibility for an introductory book. "The proliferation of lan-

guages that is resulting from the battles between Sun and Microsoft is presenting some tough choices in the introductory programming curriculum," says Weems. "Ten years ago, pretty much everyone learned to program in Pascal. Now there are half a dozen viable language choices for classes like CmpSci 121, and each one requires a different textbook."

Needless to say, Weems will be very busy in the next few years. More information on the books, published by Jones and Bartlett Publishers, Inc., can be found on their web site at <http://catalog.jbpub.com>.



Undergraduates and Research. . . . (from page 8)

ALL student Jonathan Flynn is researching multi-modal interfaces for wearable computers. Humans communicate with one another using many different mechanisms. Often, the choice of mechanism (e.g. speech vs. written vs. hand gesture) depends greatly upon what each of the individuals is currently doing and the nature of the information being communicated. The goal of this project is to develop software techniques for application programs to communicate with the user in a modality-independent manner. The computer's interface will then be able to make real-time choices about when and how to present this information to the user, making the communication as efficient as possible while minimizing the distraction it might cause.

The Computer Vision Laboratory is home to two REU projects. The first, conducted in conjunction with Atlantic Coast Technologies Inc., is developing a prototype system for inspecting the underside of vehicles. The system, known as UVIS (Under

Vehicle Inspection System), generates a high-resolution, stereo image of the underside of a vehicle as it drives over an array of digital cameras. REU students James Li and Jonathan DeCarlo are helping to design and build a laboratory model of a car and of the imaging system. They are assisting in all aspects of data acquisition and analysis, and contributing to the development and implementation of complex image processing algorithms.

REU student Aniket Saha is assisting with a Vision project in audio-based three-dimensional localization. The main objective of the project is to design a system to detect speech or impulsive sound and locate the source of the acoustic signal. The idea behind the source localization problem is to process the incoming signals from an arrangement of microphones (directional and omnidirectional) by applying basic signal processing techniques. The goal has been to develop a robust algorithm for source localization in which problems in localization due to multipath propagation/reverberation are reduced.

NOTEBOOK

Faculty News

■ Distinguished University Professor **Arnold Rosenberg** was Conference Chair for the 13th ACM Symposium on Parallel Algorithms and Architectures. The Conference was held in Crete, Greece on July 4 – 6, 2001. In addition, Kluwer Academic/Plenum Publishers announced the publication of the book *Graph Separators, with Applications* by Professor Rosenberg and Dr. Lenwood S. Heath of the Department of Computer Science, Virginia Tech, Blacksburg, Virginia. The book builds on the importance of graph-theoretic models in myriad computational environments – from modeling the circuits that underlie computers to modeling the algorithms that utilize the computers. ■ Professor **Krithi Ramamritham** was recently appointed an editor of *The VLDB Journal* (The International Journal on Very Large Data Bases). In addition, Professor Ramamritham gave a plenary talk at the IFAC Conference on New Technologies for Computer Control in Hong Kong, China in November. ■ Professor **Andy Barto** gave an invited lecture at the 2001 Summer Institute of Cognitive Neuroscience, Dartmouth College, Hanover NH. His talk, titled “Reinforcement Learning” was part of the two-week summer school for graduate students from around the world. ■ Associate Professor **Shlomo Zilberstein** co-edited (with Eric Horvitz from Microsoft Research) a special issue of the *Artificial Intelligence Journal* on Computational Tradeoffs Under Bounded Resources, published in February 2001. ■ Assistant Professor **James Allan** received the Best Paper Award at the 2001 ACM Special Interest Group on Information Retrieval (SIGIR) conference

for his paper “Temporal Summaries of News Topics.”

Visitor News

■ **Michele Garetto**, from Politecnico di Torino, Italy, and **Ulf Bodin**, from Lulea University, Sweden, are Visiting Research Scholars with the Computer Networks Research Group. ■ Technion’s Professor **Shimon Even** is a Visiting Research Professor with the Theoretical Aspects of Parallel and Distributed Systems (TAPADS) laboratory. ■ Joining the Laboratory for Perceptual Robotics is Visiting Researcher **Antonio Morales**, of the Universitat Jaume, Spain. ■ **Kathleen Steinhofel** joined the Machine Learning Laboratory as a Visiting Research Professor from the German National Research Institute for Information Technology (GMD). ■ The Center for Intelligent Information Retrieval welcomed **Nicola Stokes**, a Visiting Researcher from the University College, Dublin. ■ **Thomas Wagner** joined the Multi-Agent Systems (MAS) Laboratory as a Visiting Scholar from the University of Maine.

Research News

■ Senior Research Scientist **Zhigang Zhu** gave an invited talk titled “Omnidirectional stereo vision” at the Workshop on Omnidirectional Vision Applied to Robotic Orientation and Nondestructive Testing. The workshop was part of the 10th IEEE International Conference on Advanced Robotics in Budapest, Hungary, August 22-25, 2001. ■ At this summer’s International Conference of Machine Learning at Williams College in Williamstown, MA, UMass researchers and alums had a strong showing. UMass presenters and authors included Professor **Andy Barto**, Associate

Towsley selected as Distinguished Faculty Lecturer

DON TOWSLEY IS AMONG FOUR UMASS PROFESSORS selected to present this year’s Distinguished Faculty Lecture Series. Following his lecture titled “The Internet: Order or Chaos?” Towsley will receive the Chancellor’s Medal, the highest honor bestowed upon individuals for exemplary and extraordinary service to the campus.



Towsley

As Co-Director of the Computer Networks Laboratory, Distinguished University Professor Towsley has focused

on two specific research areas: the development of mathematical techniques for analyzing the performance of complex systems, including networking, and on the development of control mechanisms for these complex systems. Much of his work has focused on multicasting, a highly efficient way of sending information via computer to more than one recipient. His most recent research explores the use of multicasting to automatically monitor how well a network is operating.

“There is great room for improvement in network performance,” says Towsley. “Often data gets delayed or thrown away.” He is working on research to create tools that will enable people to identify where in the network a problem has occurred.

Professor **Sridhar Mahadevan**, current UMass graduate students **Mohammad Ghavamzadeh**, **Theodore Perkins**, and **Amy McGovern**, and alumni **Richard Sutton** (Ph.D. ’84), **Claire Cardie** (Ph.D. ’94), and **Doina Precup** (Ph.D. ’00). **Carla Brodley** (Ph.D. ’94) was a conference Co-Chair and Research Assistant Professor **David Jensen** was Workshop and Tutorials Chair. ■ The CIIR welcomed six Senior Research Fellows to the lab: **Martin Choquette**, **Andrés Corrada-Emmanuel**, **Sergio Guzman-Lara**, **Thomas Kalt**, **Anton Leuski** (Ph.D. ’01), and **Hayri Sever**. ■ **Kenneth Rath** joined the Center for Knowledge Communication (CKC) as a Senior Research Fellow.

Graduate Student News

■ **Bill Hesse**, of the Theoretical Computer Science Group, received the 2001 ICALP Best Paper Award. His paper, “Division is in Uniform TC⁰,” was presented at the Twenty-Eighth International Colloquium on Automata, Languages and Programming, the most important European theory conference. He was awarded the combined best paper and best student paper awards. ■ **Katrina Hanna** of the Secure Internet and Group-Networking Laboratory received an NSF Graduate Fellowship, one of only four awarded by CISE/Networking in the country this year.

Croft takes the helm

PROFESSOR W. BRUCE CROFT HAS TAKEN OVER as Department Chair for a three-year term succeeding Professor Jim Kurose. A member of the CS faculty since 1979, Croft has served for the past nine years as the founder and director of the Center for Intelligent Information Retrieval (CIIR).

Croft's research interests are in several areas of information retrieval, including retrieval models, search engines, cross-lingual retrieval, question answering, text summarization, and text data mining. He has published more than 120 articles on these subjects. He also has an extensive background in collaborating with industry and government partners. As director of the CIIR, Croft worked with over 80 Center members that ranged from small businesses (such as Infoseek and Dragon Systems) to large companies and Fortune 500 corporations (such as America Online and Lotus Development Corporation).

In 2000, Croft was appointed a Distinguished University Professor and also received the Research Award from the American Society for Information Science and Technology. He is a member of the National Research Council's Computer Science and Telecommunications Board, editor-in-chief of the ACM journal *Transactions on Information Systems*, and is an ACM Fellow. He received his Ph.D. from the University of Cambridge, England in 1979.



Croft

Lehman, and Elizabeth Partridge, have been accepted to compete in the ACM International Student Research Contest for their research poster submission on word spotting of George Washington's handwritten documents.

Staff News

■ Steve Cook, Director of the Computer Science Computing Facility (CSCF), was presented with the 2001 Chancellor's Citation Award for his outstanding, sustained, multi-year effort in the planning, con-

struction, furnishing, equipping and occupying of our new computer science building. ■ Executive Director of the Center for Computer-Based Instructional Technology (CCBIT), Dave Hart, was recognized at the Chancellor's house for his K-12 outreach work through CCBIT. Chancellor Scott presented Hart with a citation in recognition of his distinguished academic outreach for 2000-2001. ■ Michiharu Oshima joined the Experimental Knowledge Systems Laboratory (EKSL) as a Systems Programmer.

Departing faculty will be missed

PROFESSOR ROBIN POPPLESTONE announced his upcoming retirement. A feature on Popplestone will be included in the next issue of *Significant Bits*. On the UMass faculty since 1986, Popplestone is Co-Director of the Laboratory for Perceptual Robotics. Popplestone's research interests include geometric reasoning, assembly planning and visual servoing.

Bruce Croft hosted a farewell gathering at his home this summer for Associate Professor Kathryn McKinley, a member of the Department since 1993. She has moved to Texas to be closer to family and has taken an Associate Professor position at the University of Texas at Austin. Her research interests include optimizing compilers for high performance uniprocessors and multiprocessors with deep memory hierarchies, heterogeneous systems, programming tools, programming environments, performance analysis, memory management, and optimizing object oriented languages.



Kathryn McKinley with husband Scott and latest addition to the family, Wyatt.

Undergraduate News

■ Thomas S. Armstrong received the 2001 Gerald F. Scanlon Student Employee of the Year Award in a Mullins Center ceremony hosted by the Chancellor. He was given the award for his Java and database programming work on the Turns of the Centuries project (see related article) as a student employee of the Center for Computer-Based Instructional Technology (CCBIT). ■ In a rare achievement for an undergraduate, Vincent Scarlata's (BS '01) paper "*Responder Anonymity and Anonymous Peer-to-Peer File Sharing*" (co-authored by Assistant Professor Brian Levine and Georgetown University's Clay Shields) was

accepted to appear at the ninth International Conference on Network Protocols (IEEE ICNP 2001). ■ CS undergraduates captured three of the top five prizes in the 16th annual Mathematics Competition sponsored by Microsoft Corporation, Sun Life of Canada, and Solutions by Computer. Of the 61 entrants, Mike Mammarella won the top prize, Ning Zhang tied for third, and David Guzca received honorable mention. ■ Microsoft Corporation has awarded fellowships for the 2001-2002 academic year to undergraduates Thomas S. Armstrong, Jeffrey S. Stylos, and Srminivas C. Turaga. ■ The CIIR's summer 2001 REU students, Shaun Kane, Andrew



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NEWSLETTER of the
DEPARTMENT OF COMPUTER SCIENCE
at the UNIVERSITY OF MASSACHUSETTS, AMHERST

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GIFTS

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Mr. John M. Vervaert '73
Mr. David S. White '93
Dr. Ronald N. White '64
Ranjith & Pushpika Wijesinghe
Mr. John P. Wilson '01
Mr. Timothy M. Wright '86
Mr. David J. Yates '93