Significant BITS

Ubiquitous Sensing for Social, Behavioral, and Environmental Studies

Using sensors to continuously monitor activities, health, and lifestyles of individuals has reached unprecedented levels — smartphones have a plethora of sensors to monitor activity and location, on-body sensors enable continuous sensing of our physiological signals, and a growing number of sensors embedded in the world enable monitoring of our living spaces. "Ubiquitous sensing promises to revolutionize our understanding of the social, environmental, and behavioral determinants of a wide range of human activities and health conditions," says Associate Professor Deepak Ganesan, whose research explores novel sensor systems, algorithms, and applications.

The ability to provide a holistic view of an individual's activities, physiology, and environment has profound implications across several disciplines. One tantalizing possibility is large-scale behavioral health studies, where thousands of participants provide data through self-reports, on-phone sensors, and off-the shelf body sensors as they proceed in their daily life. "Behavioral studies today are expensive, cumbersome, and often limited to a few dozen participants," says Ganesan. "Most of us have never participated in a behavioral study because it is far too time-consuming. But a more affordable and scalable alternative is on the horizon." This new model, which Ganesan refers to as "crowdsourced behavioral studies," uses mobile phones and on-body sensors to reduce the burden of participation. Ganesan is working with researchers at the Yale Department of Psychiatry to explore these ideas in substance abuse studies — participants wear chestbands with EKG, respiration, and skin conductance sensors, together with phone-based sensing of location and activity, enabling better understanding of patterns and triggers of drug use.

Deepak Ganesan

Awards ceremony held to celebrate our alums and students

The department celebrated the accomplishments of this year's Outstanding Achievement and Advocacy (OAA) Award winners along with undergraduate and graduate student award recipients during a banquet held at the Mullins Center on Friday, May 6, 2011. Over ninety people joined the celebration.

In 2009, the department initiated the OAA award program to recognize the outstanding accomplishments of graduates of the department's degree programs and to acknowledge the support of important friends of the department.

2011 OAA recipients (l. to r.): Wei Zhao, John Woods, Irene Ros, A. Anthony Gee, Renu Chipalkatti, Michael Zyda, and Ronald Arkin.

Andrew Barto

I will be stepping down as Chair on August 31, 2011, and handing the reins over to Professor Lori Clarke. Lori has a very distinguished record of scholarship, teaching, and service within the department, the university, and nationally. I know that the department will prosper under her leadership.

In my four-and-a-half years as chair, the department has welcomed a number of new faculty members, whose cutting-edge research will take us in new directions. We have celebrated the retirement of some who helped to build the department from its beginnings, and we have lost some good friends. We have expanded our connections to other disciplines and to other departments across campus. Our new BA degree program and our new BS curriculum are in place. We have continued our efforts to foster a sense of community among our undergraduate majors and to overcome gender imbalance in computer science education. Our annual awards banquet honors the department's very accomplished alumnae and alumni. I am particularly pleased that the department has continued to go full-steam ahead in spite of annual budget cuts.

As I prepare to step down, it would be marvelous to leave Lori—indeed leave all of us—with no major challenges to confront. No one should be surprised that this is not going to happen. Old challenges hardly ever disappear, and new ones can always be counted on to come into view.

Luckily, some challenges are most welcome. Undergraduate enrollments in the CS major are rapidly increasing across the country. This is being attributed to a variety of factors: the economy, the popularity of social networking, the diminishing "geek factor" as CS is looking increasingly fashionable, and the heightened appreciation for the influence CS has on the world. The number of students in our major increased from 226 in Fall 2008, to 292 in Fall 2009, to 324 in Fall 2010, and to 399 in Fall 2011. We are well on our way to surpassing our 2001 apogee of 524 majors.

It is gratifying to witness CS's changing face and its increasing popularity. Although accommodating these larger numbers of students while maintaining the quality of both our educational and research programs will require us to make some changes, I am sure Lori can count on everyone to step up to this challenge.

A related challenge is to increase the number of pathways into and out of computation-related disciplines. As knowledge of computational principles becomes more and more essential to other disciplines, we have to find ways to better meet the needs of students outside of our major. The department's new BA degree program is a step in this direction, and over the coming years we hope to launch other degree programs to meet the needs of students having a range of aspirations in computation-related fields.

The rising popularity of courses in computer science comes at a time when we also face threats to the funding sources for the kinds of basic research that made all of the exciting recent innovations possible. We can all be proud of the nearly 62 million dollars in research funding that our faculty members have secured over the past four years, and of the exciting new ideas and initiatives that their projects are generating. As we welcome a new University President, we must continue to emphasize the centrality of these projects to the stature of our campus.

The accomplishments during my tenure as chair have only been possible thanks to the incredible vitality of everyone associated with the department, past and present. It has been a great privilege to work with such an inspiring group.

Clarke elevated to IEEE Fellow

Professor Lori Clarke was named to the 2011 class of Institute of Electrical and Electronics Engineers (IEEE) Fellows. She received the distinction "for contributions to software testing and verification." IEEE Fellow is a distinction reserved for select IEEE members whose extraordinary accomplishments in any of the IEEE fields of interest are deemed fitting of this prestigious grade elevation. IEEE is the world's largest professional association for the advancement of technology.

Clarke is co-Director of the Laboratory for Advanced Software Engineering Research (LASER). She has worked in the area of software engineering, particularly on software analysis and testing, for many years. She was one of the primary developers of symbolic execution, a technique used to reason about the behavior of software systems and to select test data, and she made contributions in the areas of software architecture and object management. Clarke is a former vice chair of the Computing Research Association (CRA) and co-chair of CRA's Committee on the Status of Women in Computing Research (CRA-W), IEEE Distinguished Visitor, ACM National Lecturer, IEEE Publication Board member, associate editor of ACM *TOPLAS* and IEEE *TSE*, member of the CCR NSF advisory board, and ACM SIGSOFT secretary/treasurer, vice-chair, and chair.

Zilberstein named an AAAI Fellow

Professor Shlomo Zilberstein was elected as a Fellow of the Association for the Advancement of Artificial Intelligence (AAAI) for "significant contributions to decision-theoretic reasoning, resource-bounded reasoning, automated planning, decentralized decision making, and multi-agent systems." The AAAI will celebrate this honor in August at a Fellows dinner during AAAI-11 in San Francisco, California.

Founded in 1979, AAAI is devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines. The Fellows awards program started in 1990 to recognize those who have made consistent and significant contributions throughout their career in the artificial intelligence field.

Zilberstein is the Director of the Resource-Bounded Reasoning Laboratory (RBR). His research focuses on the foundations and applications of resource-bounded reasoning techniques, which allow complex systems to make decisions while coping with uncertainty, missing information, and limited computational resources. He has published broadly in probabilistic reasoning, planning, and multi-agent systems.

He currently serves as the president of ICAPS, the organization that runs the International Conference on Automated Planning and Scheduling. He is also editor-in-chief of the *Journal of Artificial Intelligence Research*. Zilberstein received his Ph.D. in Computer Science from the University of California Berkeley in 1993.

Clarke named CS Chair

In September, Professor Lori Clarke will become the department chair for a three year term, succeeding Professor Andrew Barto, who served in the position for the past four and a half years. Clarke, co-Director of the Laboratory for Advanced Software Engineering Research, joined the department in 1975.

"I'm really looking forward to serving as department chair," says Clarke. "We have been most fortunate to have had excellent leadership over the years, and I certainly hope that I will be able to continue that tradition."

Victor Lesser Graduate Scholarship established

Victor Lesser with current and former students at the April celebrations.

The department celebrated Distinguished Professor Victor Lesser's career in computing on April 15, 2011 by hosting a full day of invited talks and public seminars presented by his colleagues and former students to honor his academic accomplishments and service. During the celebration, Lesser's former graduate students surprised him with the announcement that they had created an endowed scholarship in his honor in acknowledgement of his extraordinary career and his engaged and thoughtful mentoring of more than 30 computer scientists specializing in multi-agent systems.

The scholarship, named the **Professor Victor Lesser Graduate Scholarship in Artificial Intelligence**, will be given annually to help attract and retain a talented Computer Science student in Artificial Intelligence. This endowed fund will be an enduring legacy to Lesser's influence in his field and on the department. Additional gifts to the scholarship may be made by contacting Julie Stubbs in the College of Natural Sciences at 413-545-1245 or **stubbs@cns.umass.edu**.

UBIQUITOUS SENSING – – – – – – *continued from page 1*

"Crowdsourced behavioral studies is just one example of what can be enabled through such human-centric sensing," says Ganesan. "Using people to contribute sensor data can benefit a long list of applications from ecological monitoring to transportation."

Ganesan and colleague, Associate Professor Mark Corner, are creating a mobile sensing platform called mCrowd (currently available for iPhones), which is designed to be a research enabler for ubiquitous sensing through smartphones. mCrowd currently enables a researcher to rapidly create "mobile sensing tasks" that involve data collection from on-phone sensors (audio, video, images, surveys, GPS, wireless connectivity, etc.), and is being extended to support on-body sensors for physiological data (e.g. EKG, respiration, skin conductance, etc.). Users who download mCrowd can participate in any of these data collection efforts, in return for a reward. Ganesan believes mCrowd can be a valuable tool for human-centric sensor data collection, and can spur research innovation in a variety of disciplines.

Ganesan's group is exploring several research challenges in such human-in-the-loop sensing systems. Together with collaborators at the University of Memphis, Ganesan and his student Moaj Musthag studied the use of micro-payment strategies to provide incentives to users to contribute data for behavioral user studies. "Wearing sensors for extended durations is uncomfortable, so it is important to design incentive mechanisms that can help counteract the effects of this burden," says Ganesan. The results from this study provide evidence that incentive strategies can greatly influence compliance and data quality, and provide insights on how to design better incentive mechanisms.

Another thrust of Ganesan's research is on dealing with data quality issues in human-centric sensing. Sensor data from users presents several data quality challenges such as blurry, dark, or out-of-focus images, high background noise and clutter in audio, GPS error, sensor orientation, calibration, and placement issues, missing samples, and others. Ganesan believes that humans can play an important role in addressing the data quality problem as well. "Human computation using systems such as the Amazon Mechanical Turk is an interesting piece of the sensor data analysis puzzle," he says. "Despite vast cloud computing resources, and increasingly sophisticated data processing techniques, our ability to process and filter real-world sensor data to extract useful, actionable information is still a major challenge. But human computation systems allow us to improve results by taking advantage of humans to prune or filter bad results." A recent system developed by Ganesan and his student Tingxin Yan, called CrowdSearch, uses a combination of cloud computing and human computation in a real-time manner for image search on mobile phones.

Ganesan is also exploring new sensing technologies that can improve our visibility of the physical world. "In order to fully understand an individual's lifestyle, we need more than mobile phone sensors and on-body sensors — we also need to have more sensors on everyday objects that we use and the environment we live in," he says. But sensors need energy, and the size and weight of batteries is a major hurdle for

mCrowd is designed as a marketplace for tasks involving activity, physiological, and ambient sensor data collection through mobile phones.

ubiquitous sensing. Ganesan and colleague, Associate Professor Kevin Fu, are exploring energy harvesting-based RFID sensors, that operate continually on using ambient energy from tiny harvesting units such as solar cells, and communicate using energy-efficient passive backscatter techniques. Ganesan and his students, Jeremy Gummeson and Pengyu Zhang, have designed techniques for optimizing range and throughput from these devices, and they are currently exploring how to make such devices interact with smartphones through Near Field Communication (NFC).

Ganesan is currently an Associate Professor in the department. He received his Ph.D. in Computer Science from UCLA in 2004 and his bachelors in Computer Science from IIT, Madras in 1998. He received an NSF CAREER Award in 2006, an IBM Faculty Award in 2008, and a UMass Amherst Lilly Teaching Fellowship in 2009. He was a Program co-chair for ACM SenSys 2010.

Fu hosts RFIDsec

Associate Professor Kevin Fu hosted the 7th Workshop on RFID Security and Privacy (RFIDsec) at UMass Amherst in June. The keynote speaker was Adi Shamir, a Turing Award recipient and co-inventor of the RSA cryptographic algorithm. RFIDsec brings together researchers from academia and industry to discuss and collaborate on topics that aim to improve the security and privacy of RFID, NFC, contactless technologies, and the Internet of Things. RFIDsec bridges the gap between cryptographic researchers and RFID developers through invited talks, tutorials, and contributed presentations and posters. More information appears on **rfid-cusp.org/rfidsec.**

Kurose receives Conti Fellowship; named to posts at NSF and CRA

Ben Barnhart photo

Jim Kurose, Distinguished Professor and Executive Associate Dean of the College of Natural Sciences, received a 2011-2012 Samuel F. Conti Faculty Fellowship Award. He was also appointed to a National Science Foundation (NSF) advisory committee and was re-elected to the Computing Research Association (CRA) Board of Directors.

As part of his Conti Fellowship, Kurose will receive a monetary award and a year's leave of absence to concentrate on activities related to graduate education, research, creative work, and scholarly attainment. Selection of the UMass Amherst Conti Fellow-

ship Award is based on demonstrably outstanding accomplishment and potential for continued excellence in research and scholarly or creative activity.

Kurose was named to the Advisory Committee for the NSF Directorate for Computer and Information Science and Engineering. According to NSF, the CISE Advisory Committee provides advice on the impact of NSF support policies and programs on the CISE community; provides oversight on program management and performance; and provides advice to the CISE Assistant Director on special issues, forming ad hoc subcommittees to carry out studies as necessary.

In another advisory role, Kurose was re-elected to the CRA Board of Directors for a three-year term beginning on July 1, 2011. The CRA Board of Directors, elected by CRA's member organizations, is a distinguished group of leaders in computing research from academia and industry.

Miklau named Lilly Teaching Fellow

The UMass Amherst Center for Teaching & Faculty Development named Associate Professor Gerome Miklau as a Lilly Teaching Fellow for the 2011-2012 academic year. The competitive Lilly Teaching Fellowships enable promising junior faculty to cultivate teaching excellence in a special year-long initiative. Previous Lilly Fellows include 11 members of the department's faculty.

Towsley receives achievement award

Distinguished Professor Don Towsley received the 2011 IEEE INFOCOM Achievement Award for contributions to the measurement, modeling, and performance analysis of computer networks at this year's INFOCOM in Shanghai, China.

This award is given to someone who has a body of work (or a single paper) that has had a significant impact on the networking community and INFOCOM. Nominations are made from the research community and a committee consisting of the three previous award winners and the program chairs of the current INFOCOM conference.

The 2011 INFOCOM Program Chairs pose with Towsley. Pictured are (l. to r.) Qian Zhang, Jie Wu, Towsley, and Byrav Ramamurthy.

For his Lilly Project, "Mining and Managing Large Scale Data," Miklau will address two common limitations of undergraduate level database courses: the current use of tiny example data sets and the use of contrived examples for the study of logical design, query languages, and system design. He plans to revise the *Information Systems* course to incorporate real applications and to explore key concepts through project work.

"Advances in technology have enabled the collection, storage, and analysis of massive data sets representing phenomena as diverse as social interactions, environmental behaviors, biological processes, and the mobility of individuals," says Miklau. "Deriving useful information from these records requires powerful algorithms and careful system design." With the course revision, Miklau will train students to derive insights from such data. Projects will begin by exploring a data analysis task on a small data set with a goal to scale-up to large data. One example project would be to process a stream of Twitter messages in real-time to filter and classify events. Miklau also plans to use cloud computing services to be able to handle the large amounts of data being processed within the course.

Miklau joined the department in 2005. He co-directs the Database and Information Management Lab with Associate Professor Yanlei Diao. Miklau received his Ph.D. in Computer Science from the University of Washington in 2005. He received an ACM SIGMOD Dissertation Award and a University of Washington William Chan Memorial Dissertation Award. In 2007, Miklau received a National Science Foundation CAREER Award.

Jensen receives Outstanding Teacher Award

Associate Professor David Jensen will be presented with the 2011 College Outstanding Teacher Award (COTA) at the College of Natural Sciences fall convocation ceremony. He was also recognized at the campus's Undergraduate Commencement for this award. The purpose of the COTA is to recognize excellence in teaching and to honor individual faculty members for their teaching accomplishments.

Jensen's teaching has won rave reviews from his students, both for his innovative teaching techniques and for his effectiveness as a mentor and advisor. Two of the techniques often highlighted by students are his Jeopardy-like questions used at the start of classes and student preclass summaries about the reading material. Both techniques motivate students to think about the material in some depth so that they will be prepared for class, which leads to more interesting and interactive classes.

Jensen selected for LiSPI

Associate Professor David Jensen was chosen through a competitive selection process to participate in the inaugural session of the Computing Research Association's (CRA) Computing Community Consortium Leadership in Science Policy Institute (LiSPI) to be held in Washington, D.C., in November. According to the CRA, LiSPI is "intended to educate a small cadre of computing researchers on how science policy in the U.S. is formulated and how our government works." Prior to his academic career, Jensen was an analyst with the Office of Technology Assessment, an analytical agency of the United States Congress.

Fahey receives Chancellor's Citation Award

Darlene Fahey, the department's Undergraduate Program Manager and Scheduling Representative, accepted a 2011 Chancellor's Citation Award from Chancellor Robert C. Holub (left) and Deputy Provost and Dean of Undergraduate Education John Cunningham during a reception held on May 4.

"Darlene is passionate about making sure our program is run well," says Professor Brian Levine, Undergraduate Program Director. "She regularly goes 'beyond the call of duty' to ensure that the productivity of our faculty and department remains high. This award will go a small way in recognizing her dedication and efforts."

The Chancellor's Citation Award recognizes and honors staff members who have demonstrated exemplary performance in the service of UMass Amherst.

Graduate fellowships awarded

Upendra Sharma, a graduate student in the Laboratory for Advanced System Software, was selected for a 2011-2012 IBM Ph.D. Fellowship Award. According to IBM, the IBM Ph.D. Fellowship Award is an intensely competitive worldwide program, which honors exceptional Ph.D. students who have an interest in solving problems that are important to IBM and which are fundamental to innovation in many academic disciplines and areas of study. Sharma's research interests lie broadly in operating and distributed systems. He has worked in capacity planning, provisioning, and performance modeling of distributed systems.

Incoming graduate student **James Atwood** received the 2011 *Robin Popplestone Fellowship in Robotics & Artificial Intelligence*. Atwood graduated from Oberlin College and was recently an Associate Scientist at Archimedes.

Benjamin Mears, a first year graduate student, received the 2011 *Paul Utgoff Memorial Graduate Scholarship in Machine Learning*. Mears graduated from Amherst College with a 4.0 GPA.

Scott Niekum, a graduate student in the Autonomous Learning Lab, and **Elisabeth Baseman,** an incoming graduate student and recent Amherst College graduate, were awarded 2011-2012 UMass Amherst Graduate School University Fellowships.

CS researchers helped develop IBM's 'Watson' computing system

When Watson, billed as "the smartest machine on Earth," competed on Jeopardy! in February against the show's two most successful players, UMass Amherst computer scientists were cheering for the machine. UMass Amherst is one of eight universities collaborating with IBM on the Question Answering (QA) technology behind the company's new intelligent computing system.

Watson won against the two quiz show contestants who had the longest winning streaks, Ken Jennings and Brad Rutter, in the first-ever human vs. machine Jeopardy! competition. The department held Jeopardy! viewings for the campus community during the three nights of the competition. Prior to the February 15th show, Professor James Allan spoke briefly to the crowd about how Watson is able to compete with humans.

Allan, co-director of the Center for Intelligent Information Retrieval (CIIR), and members of the UMass Amherst research team including Assistant Research Professor David Smith and graduate student Elif Aktolga, contribute special expertise to the project on several fronts, notably information retrieval, or text search. This capability of QA technology is the first step taken when looking for text that's most likely to contain accurate answers, Allan says. The system's deep language processing capabilities then analyze the returned information to find the actual answers within that text.

Distinguished Professor Bruce Croft, director of the CIIR, led the research on the open source Indri search engine being used in the Watson system.

CS graduate student Pallika Kanani worked with the IBM's DeepQA team during an internship. "I worked on applying machine learning techniques to integrate existing answer-typing algorithms," says Kanani. "It was a wonderful experience to work on such a unique and historic project and being part of a highly energetic team."

For the first time, a computing system is able to analyze natural language and complexities in which humans excel at understanding and computers do not. In this case, IBM has designed a learning system that can analyze information and respond to questions.

David Ferrucci, leader of the IBM Watson project team, says, "Watson is a breakthrough in human-to-computer communication and, through our work with the University of Massachusetts Amherst, we will continue to develop QA technologies that will allow computers to be even more helpful to humans moving forward."

Watson's ability to understand the meaning and context of human language and rapidly process information to find precise answers to complex questions holds enormous potential to transform how computers help people accomplish tasks in business and their personal lives. Watson will enable people to rapidly find specific answers to complex questions. Ongoing research collaborations will help Watson to improve all kinds of human activities such as healthcare, banking, and government.

UMass Amherst Computer Science alums Eric Brown (Ph.D. '96), John Prager (Ph.D. '79), and Chang Wang (Ph.D. '10) are now IBM researchers who worked on the DeepQA project to get Watson ready for the Jeopardy! challenge. Brown (his research was highlighted in the winter issue of *Significant Bits*) works on the design and implementation of DeepQA architecture, as well as algorithms for special question processing. Prager works in question analysis and categorization, developing algorithms for special question processing that handle such things as wordplay. Wang develops relation detection algorithms for DeepQA.

"Enabling computers to understand and answer questions as well as people do is indeed a grand challenge. It is very gratifying to see the degree of involvement of UMass Amherst alumni, faculty, and students in the DeepQA project," says Professor Andrew Barto, department chair.

Along with UMass Amherst, Massachusetts Institute of Technology, University of Texas, University of Southern California, Rensselaer Polytechnic Institute, University at Albany, University of Trento, and Carnegie Mellon University are also working with IBM on the development of a first-of-its-kind open architecture that enables researchers to efficiently collaborate on underlying QA capabilities and then apply them to IBM's Watson system.

Watson is named after IBM founder Thomas J. Watson and was built by IBM scientists who wanted to create a computing system to rival a human's ability to answer questions posed in natural language with speed, accuracy, and confidence. The Jeopardy! format provides the ultimate challenge because the game's clues involve analyzing subtle meaning, irony, riddles and other complexities in which humans excel but computers traditionally do not.

Osterweil feted at Festschrift

A Festschrift honoring Professor Leon J. Osterweil was held on May 24, 2011 during the 33rd International Conference on Software Engineering in Waikiki, Honolulu, Hawaii. Osterweil's achievements were celebrated with a day-long series of talks by prominent members of the community. Festschrift attendees received a copy of a new book produced in honor of this special occasion: *Engineering of Software: The Continuing Contributions of Leon J. Osterweil*. The book, published by Springer, compiles his most important published works to date, together with several new articles exploring the broad impact of his work. Peri Tarr (Ph.D. '96) and Alexander L. Wolf (Ph.D. '85) organized the event.

Shown above, Osterweil (seated with a Hawaiian lei) is flanked by his current and former students

Gates Foundation and EDUCAUSE fund math tutor

Research Professor Beverly Woolf and Research Scientist Ivon Arroyo received an award from the Bill & Melinda Gates Foundation and EDUCAUSE for the project "Math Fundamentals Tutor to Improve College Readiness and Completion.

In April, Next Generation Learning Challenges (NGLC) announced its first set of grants to identify and expand innovative technology-enabled approaches that improve the chances of graduating from college in the United States. From a pool of more than 600 applicants, 29 organizations will receive grants under this initiative.

The primary focus of Woolf's and Arroyo's project is on scaling deeper learning in mathematics through the use of Wayang, an intelligent tutor that has been used with thousands of students. The software provides multimedia advice, animated characters, and new strategies for tackling challenging problems. The system will be used in high-enrollment, low success, entry-level developmental mathematics courses in both community college and public four year schools to help students complete courses and persist throughout the college experience. The secondary focus of the project is on the use of real-time outcome data for students, instructors, and advisors, to improve student success.

NGLC is a multi-year, collaborative initiative focused on identifying and accelerating the growth of effective education technologies that can help improve college readiness and completion in the United States—especially among low-income individuals. EDUCAUSE, an organization dedicated to advancing higher education through the use of technology, leads the NGLC. The Bill & Melinda Gates Foundation and the William and Flora Hewlett Foundation helped design the NGLC, and fund the initiative.

Pauline Hollister (1956 - 2011)

Pauline Hollister died in Chicopee, MA at the age of 54 on March 20, 2011 after a battle with cancer. Hollister was the department's receptionist from 1998 to 2007. She left CS to take a position on campus as the Assistant to the Dean of the School of Public Health and Health Sciences.

"She was always a smiling presence and was always eager to help anyone who came by," says Department Chair Andrew Barto. "She will be greatly missed by all of us."

She leaves her husband of 34 years, George L. Hollister; a daughter, Cindy Ann Hollister, of Springfield; her mother, a sister, a brother, two nieces, her mother-in-law, and several cousins. Memorial contributions may be made to Dana-Farber Cancer Institute, P.O. Box 849168, Boston 02284-9168.

Fu leads team on a health information privacy and security center
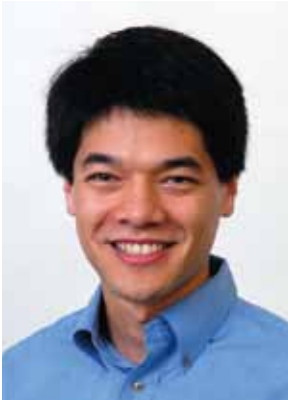
Associate Professor Kevin Fu is leading the UMass Amherst team which is part of a $15 million health information privacy and security initiative. The Strategic Healthcare IT Advanced Research Projects on Security (SHARPS), led by the University of Illinois-Champaign, is one of four projects funded under the $60 Million Strategic Health IT Advanced Research Project—established to focus on solving current and future challenges that represent barriers to adoption and meaningful use of health information technology. SHARPS is supported by the Health and Human Services Office of the National Coordinator. The awards are funded by the American Recovery and Reinvestment Act of 2009.

SHARPS focuses on three health information environments: electronic health records, health information exchange, and telemedicine. A multidisciplinary team of computer security, medical, and social science experts is developing security and privacy policies and technology tools to support electronic use and exchange of health information. The projects address strategic cross-cutting themes that foster collaboration, consistency, and a multi-purpose technology convergence of these environments.

UMass Amherst is part of this collaborative effort of twenty senior researchers representing expertise in cyber security and healthcare at the following twelve institutions: University of Illinois, the University of California at Berkeley, Carnegie Mellon University, Dartmouth College, Harvard Medical School, Johns Hopkins University, New York University, Northwestern Memorial Hospital, Stanford University, UMass Amherst, the University of Washington, and Vanderbilt University. Project details appear at **sharps.org**.

For this four-year project, Fu is focusing on improving the security and privacy of implantable medical devices. He was also responsible for forming the advisory board that oversees the progress of the project. Fu has been recognized by *Technology Review* magazine as the 2009 TR35 Innovator of the Year for his cutting-edge research to improve computer security and privacy for such applications as implantable medical devices and contactless credit cards without compromising safety or effectiveness. In 2009, Fu also received a prestigious Alfred P. Sloan Foundation Research Fellowship and a five-year National Science Foundation (NSF) Faculty Early Career Development (CAREER) award for his security and privacy research.

Fu leads the Security and Privacy Research lab (SPQR) at UMass Amherst. He is the director of the RFID Consortium on Security and Privacy and co-director of the Medical Device Security Center. For more information, please visit **spqr.cs.umass.edu**.

Robert Walls (left) and Yahoo! Academic Relations Director Ken Schmidt

Walls named Yahoo! KSC Winner

Yahoo! announced that Robert Walls was named a Yahoo! 2011 Key Scientific Challenges (KSC) Award Winner in the area of security & privacy. Walls is a graduate student advised by Professor Brian Levine.

The KSC Program was created to recognize outstanding graduate student researchers who Yahoo! believes have the greatest potential to make significant contributions and become leaders in their research fields. Winners receive $5,000 each in unrestricted seed funding for their research and will also have an opportunity to work closely with scientists at Yahoo! Labs to advance their research. The 27 winners are invited to the Yahoo! Key Scientific Challenges Graduate Student Summit, where they will present and defend their findings to their peers and to Yahoo! Labs' leadership in structured workshops.

This is the third year of the prestigious Yahoo! Award program and the third time that a student from UMass Amherst Computer Science has won. In 2010, Sameer Singh and Michael Wick received KSC Awards, and the 2009 winners included Gregory Druck and Henry Field.

Cisco supports CS undergrads

Cisco Systems, a member of the department's Industrial Affiliates Program, provided scholarships for five of the Department's undergraduate students. Priscilla Briggs is the recipient of the 2011 Cisco Systems Scholarship for Underrepresented Undergraduate Students at UMass Amherst Computer Science. Caleb Raitto, Jessica Ray, Evan Shelhamer, and Derek Wood are the recipients of the 2011 Cisco Award for Outstanding Achievement as a Junior. In addition to the scholarships, Cisco sponsored a programming competition organized this spring by the UMass Amherst ACM student chapter.

CS Undergraduate Dean's List – Spring 2011

Acciavatti, Raymond John
Adams, Jason D.
Aquino, Alexander Thomas
Avery, Sean T.
Badov, Mikhail
Barber,
   Michael-Patrick Kevin
Barrenechea, Mario B.
Becker, Ryan William
Blat, Marek
Bonci, Tyler T.
Briggs, Priscilla E.
Bristol, Alexander Lawrence
Bronk, Harold R.
Brown, Sean M.
Bryant, George N.
Chadowitz, Chaniel
Cheang, Wai
Chiu, Stanford H.
Connell, Ryan J.
Cotter, Kaelan R.
De Mello, Felipe R.

Delaney, Joshua J.
Diederich, Colin Joseph
Ding, Yi
Dooley, Sean P.
Eid, Jacob Imad
Eng, Christopher Robert
Gottlieb, Eli Z.
Guineau, Shane W.
Haan, Joshua A.
Hallahan, Brett T.
Hebert, Mitchell Ryan
Hughes, Kyle Robert
Hummel, Jeremy M.
Hurley, Ryan C.
Ioannou, Nicolas
Israel, Maxime Arthur
Izotov, Andrey Kirillovich
Kaufman, Yael
Kim, Kyungyoon
Labbe, Brian J.
Larocque, Eric Shawn
Leahey, Jonathan B.

Levitzky, Yevgeni V.
Lewis, Patrick Joseph
Ling, Yan
Lowell, David B.
Madigan, Sean Robert
Masi, Daniel Patrick
Mattis, Wayne Benton
Moh, Heng Li
   Vahid Anthony
Molloy, Joshua R.
Moriarty, Ian J.
Muehlberg, Jacob
Murphy, Brendan Edward
Ng, Kwan F.
Nguyen, Anh Tung
Olejnik, Katarzyna Lucja
Parker-Martell, Elijah James
Pemmaraju, Vijay
Pezzone, Jeffrey Michael
Pittenger, Matthew C.
Ray, Jessica M.
Scarrci, Nicolas Anthony

Schuler, Joachim D.
Sewall, Aaron Casey
Shah, Vinay D.
Shenar, Gal Jonathan
Stapleton, Brian Fitzpatrick
Stark, Arthur D.
Stubbs, Daniel M.
Tang, Roger Z.
Thorat, Nikhil S.
Trask, Joshua H.
Truong, Kevin
Tsang, Ivan
Turlapati, Hridya
Vorotnikova, Sofya
Warneke, Tristan T.
Wong, Ann L.
Wood, Derek Maclean
Wortzman, Ethan A.
Wu, Mingzhen
Wu, Shijun
Yen, Timothy
Zhang, Simon Shing-Ming

2011 CS Graduating Senior Undergraduate Lunch

The department celebrated its graduating seniors with a luncheon on Wednesday, May 4, 2011

Department hosts distinguished lecturers

For the 2010-2011 Distinguished Lecturer Series (DLS), the department hosted six prominent speakers.

Hector Geffner, Professor at the Department of Information and Communication Technologies at the Universitat Pompeu Fabra, spoke in September on "The Model-based Approach to Intelligent Behavior: Prospects and Challenges." He reviewed the models considered in current planning research, the progress achieved in solving these models, and the ideas that have turned out to be most useful.

Also in September, **Dr. Cynthia Dwork**, Distinguished Scientist at Microsoft Research Silicon Valley, gave a lecture on "The Differential Privacy Chronicles." She described a large body of work revisiting the problem from the perspective of modern cryptography. She presented techniques for achieving differential privacy while simultaneously preserving utility of the data, together with impossibility results that guided its development.

Stephanie Forrest, Professor and Chairman of Computer Science at the University of New Mexico in Albuquerque, presented "Automatic Program Repair with Evolutionary Computation" during her DLS talk in October. She described recent research applying the mechanisms of biological evolution to the problem of repairing software bugs. During her visit, Forrest spoke at both UMass Amherst and Mt. Holyoke College as part of the Distinguished Lecture Series

sponsored by Committee on the Status of Women in Computing Research (CRA-W) and Coalition to Diversify Computing (CDC).

In November, **Fred Schneider**, Samuel B. Eckert Professor of Computer Science at Cornell University, gave the presentation "Towards a Science for Security." He spoke on recent and promising avenues toward building a science base for cyber-security and toward creating a principled basis for engineering trustworthy systems.

Alexander Wolf, recipient of the department's 2010 Outstanding Achievement in Research Award, was invited to present his work as one of the DLS speakers. Wolf, Professor in the Department of Computing at Imperial College London, gave a talk on "Automated Experimentation: Beyond Deployment and Execution" in February. He presented a model-driven automation framework being developed that is intended to take better account of the full richness and complexity of the experimentation process.

Also in February, **Pat Hanrahan**, CANON Professor of Computer Science and Electrical Engineering at Stanford University, presented "Why are Graphics Systems So Fast?" He described the architectures of different Graphics Processing Units, and he discussed the programming models that are used to achieve high performance on such heterogenous architectures.

Fourth annual foosball tournament

The ACM Student Chapter hosted the department's 4th Annual CS Foosball Tournament on May 3rd. Associate Professor Erik Learned-Miller and graduate student Laura Sevilla Lara (shown competing) won this year's tournament. Graduate students Jeff Dalton and Van Dang came in second place, same as last year's tournament. Students, faculty, and staff participated in the event sponsored by Yahoo!.

Rahul Simha (Ph.D. '90), Computer Science Associate Professor within the School of Engineering and Applied Science at George Washington University, was selected as the 2010 U.S. Professor of the Year for the District of Columbia. Sponsored by the Council for Advancement and Support of Education (CASE) and the Carnegie Foundation for the Advancement of Teaching, the program recognizes the most outstanding undergraduate instructors in the country with four national winners and individual state winners.

Sharad Jaiswal (Ph.D. '05), a researcher at Alcatel-Lucent Bell Labs in Bangalore, India, was named to the MIT *Technology Review* magazine's first India TR35 list in 2010. The TR35 recognizes outstanding innovators under the age of 35 for their continuing work in India that has the highest impact locally and globally. Jaiswal was recognized for his work on projects on low-cost internet connectivity for villages (VillageNet), and scalable, low-cost distribution of rich content on mobile devices (mango).

Bo An (Ph.D. '11) received the IFAAMAS-10 Victor Lesser Distinguished Dissertation Award during the AAMAS Conference held in Taiwan in May. An is currently a Postdoctoral Associate, at the University of Southern California Department of Computer Science.

Siddharth Srivastava's Ph.D. dissertation on the "Foundations and Applications of Generalized Planning" was selected for an Honorable Mention for the 2011 International Conference on Automated Planning (ICAPS) Best Dissertation Award. He received the award at ICAPS-11, in Freiburg, Germany in June. Srivastava (Ph.D. '10) is a Postdoctoral Research Associate at UMass Amherst Computer Science.

Co-founders **Gaurav Mathur** (M.S. '07) and Tom Moss recently sold start-up company 3LM, Inc. to Motorola. The company focuses on Android services for business. Prior to 3LM, Mathur was an Android Program Technology Manager at Google.

In January, **J. Antonio Medina** (Ph.D. '97) was promoted to Vice President at Morgan Stanley, located in New York City.

Nilanjan Banerjee (Ph.D. '09), received a National Science Foundation CAREER Award for his project "System Support for Renewable Energy-driven Devices." Banerjee is an Assistant Professor at the University of Arkansas Computer Science and Computer Engineering Department.

Venkata Duvvuri (M.S. '99) recently graduated with an M.B.A. from UC Davis. He is a term analytics consultant in the areas of business intelligence and marketing analytics within the Global Customer Database Marketing team at Apple Computer.

Wei Zhao (Ph.D. '86) was recognized with an honorary doctorate degree jointly conferred by 12 Portuguese universities for his achievement in educational development at the University of Macau where he is the current rector and a chaired professor.

As part of his sabbatical, **Henning Schulzrinne** (Ph.D. '92) has been working in Washington, D.C. as a Distinguished Engineering Fellow at the Federal Communications Commission (FCC). The FCC does much more than policing the airwaves for inappropriate content. For example, the FCC manages all non-governmental spectrum (radio frequency) use in the U.S., and approves all devices that can emit radio frequencies. Schulzrinne has been helping with a number of FCC projects, ranging from next-generation 9-1-1 to open Internet issues, video relay services, and "bill shock." Most recently, he is a member of a new advisory council that will help ensure that people with disabilities can make emergency calls even if they cannot hear or speak.

Jamieson Cobleigh (Ph.D. '07) and **Rachel Smith Cobleigh** (Ph.D. '08) are pleased to announce the birth of their daughter Eliya Marie, born on June 3, 2011.

Nominate a fellow alum

Nominations are now being accepted for the 2012 Outstanding Achievement and Advocacy Awards. Nominations should be sent by email to Leeanne Leclerc (leclerc@cs.umass.edu). The information below would be appreciated with your nomination:
- The name, title, email, phone number, and organizational affiliation of the nominee,
- The name(s), email(s), and phone number(s) of the nominator(s),
- A brief biography summarizing the nominee's career (no more than one page),
- A statement of the nominee's outstanding achievements in the award category,
- A very brief (no more than 25 word) suggested citation to be written on the OAA winner's award plaque. Details on the 2011 event can be found at **www.cs.umass.edu/oaa2011**

We need your support

Your gifts are invaluable in helping the department fulfill its goals of excellence in research and teaching. These gifts are important in augmenting our regular programs by promoting undergraduate and graduate research, supporting seminars by outstanding scientists, and helping new faculty establish their research programs. Those contributions that are designated for specific programs also fund activities that enrich our educational and research programs.

One of our goals is to enhance the undergraduate experience to more accurately reflect the excitement that the field of computer science offers. To meet this goal, we must provide awards and scholarships for our students, new equipment for our labs, improved classrooms, and more seminar series. In addition, donations to our CS Endowment fund will have continuing benefits to the department's graduate and undergraduate programs.

Alums

Department Chair Andrew Barto and Steve Goodwin, Dean of the College of Natural Sciences, welcomed the attendees and gave an overview of the department. Professor Leon J. Osterweil presented awards to the following 2011 OAA recipients:

- Outstanding Achievement in Research: **Ronald Craig Arkin** (Ph.D. '87) - Regents' Professor and Associate Dean for Research and Space Planning in the College of Computing at Georgia Institute of Technology. He is also the Director of the Mobile Robot Laboratory.
- Outstanding Achievement in Management: Renu Chipalkatti (M.S. '87) - Global Head, Vertical Industry Solutions: Product Management at Verizonbusiness
- Outstanding Achievement in Entrepreneurship: **A. Anthony Gee** (B.S. '90) - co-Founder and Managing Partner of Carthage Capital Group
- Outstanding Achievement by a Young Alum: **Irene Ros** (B.S. '06) - Research Developer at the Visual Communication Lab, a group within the Collaborative User Experience group at the Center for Social Software at IBM Research; as of July: Senior Programmer at Bocoup
- Outstanding Achievement in Public Service: **John L. Woods** (Ph.D. '80) - retired in 2006 as President and General Manager of TRW's Electromagnetic Systems Laboratory
- Outstanding Achievement in Education: **Wei Zhao** (Ph.D. '86) - Rector and Chaired Professor of the University of Macau
- Outstanding Achievement in Technology Development: **Michael Zyda** (M.S. '78) - Director of the Game Pipe Laboratory and a Professor of Engineering Practice in the Department of Computer Science at the University of Southern California

More details on the careers of the OAA award recipients, along with photos of the event, are posted at **www.cs.umass.edu/oaa2011**.

During the OAA banquet, CNS Dean Steve Goodwin and Prof. Lori Clarke presented Andrew Barto (center) with a token of appreciation for his years of service as department chair

Grad Winners (l. to r.): J. Altidor, B. Simidchieva, D. Ruiken, B. Castro da Silva, M. Salajegheh, M. Bendersky, and S. Srivastava

During the evening's celebration, current students and recent alums were also recognized. The undergraduate and graduate awards were generously sponsored by Yahoo!, a member of the Department's Industrial Affiliates Program. Professor James Allan, Graduate Program Director, presented the following Outstanding Graduate Student Awards:

- Outstanding Dissertation Award: **Michael Hay** (Ph.D. '10)
- Outstanding Dissertation Award: **Siddharth Srivastava** (Ph.D. '10)
- Outstanding Synthesis Award: **John Altidor**
- Outstanding Synthesis Award: **Michael Bendersky**
- Outstanding Synthesis Award: **Mastooreh Salajegheh**
- Outstanding Teaching Assistant Award: **Bruno Castro da Silva**
- Outstanding Teaching Assistant Award: **Dirk Ruiken**
- Outstanding Teaching Assistant Award: **Borislava I. Simidchieva**

Professor Robbie Moll, Department Associate Chair, presented the following Outstanding Undergraduate Awards to students in this year's graduating class:

- Overall Achievement in Computer Science: **Sean P. Dooley**
- Achievement in Artificial Intelligence: **Jonathan B. Leahey**
- Achievement in Networking: **Felipe Ribeiro de Mello**
- Achievement in Security: **Anthony R. Duran**
- Achievement in Software Engineering: **Ryan C. Hurley**
- Achievement in Systems: **Demetre E. Lavigne**
- Achievement in Theory: **Nicolas A. Scarrci**

The department would like to thank all those who participated in these successful events. We look forward to seeing more alums at next year's event.

Undergrad Winners (l. to r.): F. Ribeiro de Mello, A. Duran, S. Dooley, R. Hurley, N. Scarrci, D. Lavigne, and J. Leahey

Faculty News

Yanlei Diao, Kevin Fu, and **Gerome Miklau** were each promoted to Associate Professor with tenure.

Associate Professor **Yanlei Diao** was selected to receive a competitive 2010 IBM Scalable Data Analytics for a Smarter Planet Innovation Faculty Award for her project, "Streaming Analytics in Large-Scale Monitoring Applications." Also, Professors **James Allan** and **Prashant Shenoy** each received 2010 IBM Faculty Awards. In addition, NEC Laboratories America provided research funding to Diao and Shenoy.

Associate Professor **Kevin Fu** delivered a statement about Trustworthy Medical Device Software to the U.S. Senate Special Committee on Aging that provides oversight of the U.S. Food and Drug Administration.

Distinguished Professor **Jim Kurose** gave a keynote talk "Cyber-physical systems: linking sensing, networking, computation, and people" at the 2011 IFIP Networking Conference in Valencia, Spain. He is also the lead U.S. - organizer for the NSF/DIT Indo-U.S. Workshops on Developing a Research Agenda in Pervasive Communications and Computing Collaboration (PC3). These workshops, sponsored by the U.S. National Science Foundation and the Indian Department of Information Technology, are bringing together researchers from U.S. and Indian universities to discuss and begin development of collaborative research efforts and proposals in pervasive communications and computing.

Distinguished Professor **Don Towsley** was a keynote speaker at The Third International Conference on Communication Systems and Networks (COMSNETS).

Professor **Andrew Barto** will be a guest lecturer in the psychology department at the University of Washington next spring, sponsored by the Roger Brown Loucks Lectureship in Neurophysiological Basis of Learning and Memory. Loucks endowed lectures by outstanding scholars who have achieved recognition in the field of neurophysiological psychology. Barto will also give a keynote address on reinforcement learning and cognitive robotics at a joint meeting of the IEEE International Conference on Development and Learning and the International Conference on Epigenetic Robotics to be held in Frankfurt, Germany in August.

Distinguished Professor **Bruce Croft** was a Program Co-Chair of ACM SIGIR 2011 held in Beijing, China in July.

Assistant Professor **Rui Wang** gave an invited keynote speech, "Interactive Global Illumination Using Points," at ChinaGraph 2010 held in Nanjing, China. Wang is also currently serving as a papers co-chair for ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D) 2012.

Google provided research funding to Professor **Andrew McCallum** for his work on "Programming Support for Scalable Probabilistic Modeling," and to Associate Professor **Deepak Ganesan** for his research on "Combining Clouds and Crowds in Real-time Information Systems.

Researcher News

A UMass-led team ranked first in three out of the four tracks they submitted to the 2011 BioNLP (Biomedical Natural Language Processing) shared task. This task challenged participants to extract information on biomolecular events from research papers. Postdoctoral Research Associate **Sebastian Riedel** and Professor Andrew McCallum provided the core system that was used for the UMass Amherst/Stanford University team's submission in the BioNLP shared task on event extraction.

The Center for Intelligent Information Retrieval is hosting two visiting researchers, **Jaeho Choi,** from NHN Corporation, and **Mostafa Keikha,** from the University of Lugano.

Jianqing Ma is a Visiting Professor from Fudan University who is working with Distinguished Professor Don Towsley.

Abzatdin Adamov, CIO and Head of the Computer Engineering Department at Qafaqaz University in Azerbaijan, is a Visiting Scholar working with the Autonomous Learning Laboratory.

Hay wins 2011 ACM SIGKDD Dissertation Award

Michael Hay (Ph.D. 2010) was selected as the winner of the 2011 Association for Computing Machinery Special Interest Group on Knowledge Discovery and Data Mining (ACM SIGKDD) Ph.D. Dissertation Award for his dissertation titled "Enabling Accurate Analysis of Private Network Data." The award will be presented during the opening ceremonies at the ACM SIGKDD Conference on Knowledge Discovery and Data Mining in San Diego to be held in August. Hay is currently a Computing Innovation Fellow at Cornell University doing research on designing practical tools for privacy-preserving analysis of complex data. His advisors at UMass Amherst were Associate Professors Gerome Miklau and David Jensen.

Student News

Graduate students **Marc Cartright** and **Pallika Kanani** are the recipients of this year's Accomplishments in Search & Mining Awards, sponsored by Yahoo!.

CS undergrad and ACM Student Chapter Chair **Mario Barrenechea** (B.S. '11) teamed with economics major Sam Azar to manage the development of a UMass Bookswap program that would provide students with an easy and affordable way to purchase textbooks. CS undergrads **Chris Childs** and **Matt Reault** worked on the software development and web design for the UMassBookSwap.com website.

The winners of the Cisco-sponsored UMass Amherst ACM Student Chapter Programming Competition held this spring were UMass Amherst CS students **Joshua Trask** (1st) and **Anthony Moh** (2nd) and Hampshire College student Nathan Whitmore (runner-up).

The UMass Amherst ACM Student Chapter officers for AY 2011-2012 include: **Evan Shelhamer**, President; **Brian Nolin**, Vice President; **Michael DeRoy**, Treasurer; and **William Crane**, Secretary.

Graduate student **Jeff Dalton** was named one of the final 38 contestants on Fox TV's MasterChef Season 2 series. CS Alum David Miller was a finalist in Season 1.

Graduate student **Michael Bendersky** and his wife Marina welcomed their daughter Sophie into the world on March 15.

At the ACM SIGIR 2011 conference held in July, graduate student **Elif Aktolga** presented how she improved Many Bills "misfit" detection algorithm while an intern at IBM. Many Bills was designed by researchers at IBM Research Visual Communications Lab in Cambridge, MA to simplify viewing of Congressional bills. The site was named an Official Webby Award Honoree. Webby is the leading international award that honors excellence on the Internet.

Mitchell retires

Gwyn Mitchell, shown here at a surprise party held in her honor on May 19, will retire at the end of September after working 34 years in the department. Mitchell is longtime administrative staffer for Professor Andrew Barto and Beverly Woolf, working as a grant administrator for the Autonomous Learning Laboratory, the Center for Knowledge Communication, and the former Center for Computer-Based Instructional Technology. Along the way, she has worked for a host of other CS faculty including David Kulp, Hava Siegelmann, and Sridhar Mahadevan. Mitchell was hired at UMass Amherst when Computer Science was a program in the Graduate School, working for Professor Michael Arbib. She continued with Arbib after he became the chair of the newly formed Department of Computer and Information Science (COINS) within the Faculty of Natural Sciences and Mathematics.

"It is hard to find words to adequately express my gratitude to Gwyn for her contributions to the Department through her support of the research groups that have thrived under her care," says Barto. "She has played an essential role in the submission of an untold number of grant proposals, in expert management of research projects, and in untangling too many thorny bureaucratic issues to count—often working on weekends. Gwyn's expertise and dedication have contributed in many ways to the success of the department."

Test-of-Time Award for McCallum

At the 28th International Conference on Machine Learning held in June, Professor Andrew McCallum and co-authors John Lafferty and Fernando Pereira received the 2011 Test-of-Time Award for their paper "Conditional Random Fields: Probabilistic Models for Segmenting and Labeling Sequence Data."

According to ICML, this award recognizes papers that time and hindsight proved to be of lasting value to the machine learning community. Their paper was originally published at ICML in 2001.

Staff News

Cheryl Kiras joined the Commonwealth Alliance for Information Technology Education (CAITE) as its Pathways Coordinator.

David Korpiewski, CSCF Software Specialist, was elected President of the Franklin County Radio Control Club (**www.franklinrc.com**), a model airplane club based out of the Turners Falls airport. Korpiewski also recently won a TAG (take off and grow) grant to help the club promote model aviation.

We're on
Facebook and LinkedIn

Keep up-to-date on the department's latest events and announcements. Join us on Facebook (group name: UMASS CS) and LinkedIn (group name: UMass Amherst Dept. of Computer Science).

Significant Bits

Thanks for your support

The following alumni and friends have actively supported the Department of Computer Science from October 2010 through April 2011. Such financial support is greatly appreciated and helps maintain a world-class instructional and research program. Contributions from alums and friends help to fund important special activities that are not supported through the state budget.

Those interested in helping the department should visit **www.cs.umass.edu/about/donate** for online donations or send a check made out to *UMass Amherst* to:
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