INSIDE CS

Department of Computer Science

Notes from the Chair
by
Prof. Larry Davis

The fall semester is well underway, and this academic year promises to hold many challenges and opportunities for our department. Maryland, like most states, has seen dramatic declines in tax revenues; this has resulted in large funding reductions to universities, which eventually get passed down to individual departments. We have had our budget reduced by approximately 5% in FY09 and by 9% this year, which has resulted in reductions to personnel and other cost containment measures. Nevertheless, our department is in reasonable financial condition due to prior years' savings, and, in fact, we are in the midst of searching for up to four new faculty members for next academic year. We are specifically focusing on hiring in the areas of computational biology, natural language processing and database systems, as well as the Minker Chair. We interviewed over 15 candidates during late October and early November, and hope to have a few new faculty members signed up soon.

The Department has joined forces with the Maryland Institute for Technology in the Humanities (MITH) to launch a new living/learning program, Digital Cultures and Creativity (DCC), to be housed within the University Honors College. DCC is sponsored by the College of Arts and Humanities and co-sponsored by the College of Computer, Mathematical, and Physical Sciences (the Computer Science Department) and the College of Information

Studies. Designed for the 21st century student who was born into the world of windows and the web, Digital Cultures and Creativity (DCC) provides an innovative living and learning community that combines art, imagination and global citizenship with new media and new technologies. Depending on individual interest, students will pursue activities including digital music and video production, digital art, creative electronic writing, virtual worlds and the development of software and online communities. The first cohort of students will arrive in September 2010, and both Ben Bederson and Nelson Padua-Perez will be teaching in the program next year. DCC is being directed by Prof. Matt Kirschenbaum of the Department of English.

After 25 years with the department, Janice Jastrzebski will be retiring this January. Jan has done an exceptional job monitoring (and controlling!) the department's budgets for many years; the College consistently uses the financial reports Jan produces as models for other departments to emulate. In large part, our ability to effectively cope with the recent financial setbacks is due to the excellent financial projections and analyses that Jan has provided.

Three faculty members were promoted last year – Jeff Foster to Associate Professor and David Jacobs and Bobby Bhattacharjee to Full Professor. The department now has two faculty members serving in the College as Associate Deans. This past summer, Bonnie Dorr assumed the position of Associate Dean for Faculty Affairs, Research and Graduate Education, and the previous year Jim Purtilo became the Associate Dean for Undergraduate Education. Both continue to do research and limited teaching.

The newsletter has articles about recent activities in software engineering, HCI and database systems. We are also highlighting recent post-doctoral hires, a visiting Fulbright scholar, and one article from an UG student. We hope you enjoy the articles and encourage alumni to send us

information on what they have been doing during the past 12 months.

CS Prof Helps Win $10 Million NSF Grant for Computational Modeling and Analysis of Complex Systems

The National Science Foundation awarded a five-year, $10M grant to an interdisciplinary consortium of researchers from eight different research organizations, including a team at UMD headed by CS Professor Rance Cleaveland.

The project will focus on the development of techniques based on model checking and abstract interpretation, which have been used by computer scientists since their invention in the late 1970s / early 1980s for analyzing the correctness of software, to analyze models of disparate systems such as aircraft and automotive control applications and biological phenomena such as pancreatic cancer and cardiac arrhythmia.

The award was announced August 11 and is part of NSF's "Expeditions in Computing" initiative. The Maryland team, which includes Cleaveland, Electrical and Computer Engineering Professor Steve Marcus, and School of Public Health Biostatistics Professor Tongtong Wu, will work with scientists at Carnegie Mellon University, New York University, the University of Pittsburgh Medical Center, the City University of New York, SUNY Stony Brook, Cornell University and NASA's Jet Propulsion Laboratory. Cleaveland and Marcus also have joint appointments in the university's Institute for Systems Research.

Cleaveland says he, Marcus and Wu hope to develop revolutionary techniques for automatically analyzing and predicting

the behavior of biological and control systems. Using the new techniques, scientists and engineers will be able to greatly accelerate the pace of their discoveries by automating tasks that currently must be performed manually.

The Maryland team is looking to build upon scientific methods developed by the computer science and electrical engineering communities for determining if software and computer hardware behave correctly. The UM research will extend the capabilities of these testing methods from digital systems to more complex systems arising at the intersection of computing and the natural world, such as control and biological systems.

Cleaveland notes that the work is intrinsically multidisciplinary. "Up to now, our team has been working independently -- this brings together the three of us on new work that draws on all our backgrounds," he says. He notes that scientific and engineering disciplines are increasingly using simulation models to drive research, and that these models can be viewed as large software systems to which software-analysis techniques can be applied.

Cleaveland's research focuses on methods for modeling and checking the correct behavior of embedded software, such as that used in cars for antilock brakes or for flight control on planes. He has worked in this area for 20 years and has over 120 peer-reviewed publications on these topics.

At the university, he is also Executive and Scientific Director of the Fraunhofer USA Center for Experimental Software Engineering, an applied-research institute that focuses on basic software-engineering research and technology transfer.

The overall team of 19 scientists and engineers assembled for this NSF multi-institutional project includes two Turing Award winners, a recipient of the National Medal of Science and awardees of other prestigious research prizes.

The $10 million in NSF funding includes developing a highly ambitious cross-disciplinary educational program called "Complex Systems Science Engineering" and an annual minority-focused workshop for undergraduates on understanding complex embedded and biological systems.

While these programs are held at other institutions involved with the NSF grant, University of Maryland students are eligible to participate, and there are other research opportunities available for Maryland graduate and postdoctoral students within the NASA JPL Research Affiliates Program.

TRANSLATION AS A COLLABORATIVE PROCESS

Faculty members Ben Bederson and Philip Resnik were recently awarded a CDI grant from NSF and a research gift from Google to develop a new way to translate human language in a way that is both high quality (unlike existing fully automated machine translation systems), and inexpensive (unlike existing professional human translators). And here's the trick: they promise to do this using only monolingual speakers – that is, without involving people who speak both the source and target languages.

Natural language translation remains a crucial problem that is expensive, slow to develop solutions for, and difficult to scale. While automated approaches often result in understanding the gist, scalable high quality translation remains far out of reach for the vast majority of the world's languages. A variety of projects are now emerging that tap into the Web-based community of people willing to help translate, but bilingual expertise is quite rare compared to the total availability of volunteers. Is it possible to tap into this broader volunteer base to do better translations? This project is investigating whether a combination of machine translation and human participants who speak only one of the two languages – not both – can result in high quality translations. The research is organized around development of an iterative protocol that combines elements of machine translation, human and semi-automated language annotation, and human correction, motivated by concepts in information theory and discourse analysis. The user interface based on this protocol will support both synchronous and asynchronous pairwise interaction among human participants, as well as a "bag of tasks" approach that permits truly distributed human computation in the style of Amazon's Mechanical Turk.

The basics of the protocol are simple. A volunteer who knows the original language enters the sentence to be translated into the interface. It goes through a machine translation system, showing
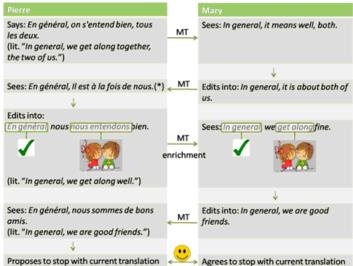

Figure 1: An example of the iterative translation protocol using French-English translation. Horizontal solid arrows indicate a pass through the system; a dotted vertical arrow indicates a user action. The asterisk (*) indicates ungrammatical French MT output.

a (possibly poor) translation to a second volunteer who knows the target language. That volunteer makes his best guess as to the meaning, and edits the sentence to make it grammatical. Then the process is reversed: the target language sentence is automatically back-translated, and the first volunteer edits the back-translation to make it grammatical and bring it closer to the original meaning. Crucially, at every stage in the process all volunteers have the opportunity to enrich the sentence with additional information – e.g. pictures, Web links, word clouds, Wikipedia pages, and highlighting correct or incorrect phrases.

Why can this protocol work? First, natural language is redundant, and humans are good at making inferences, even in the face of poor translations. Second, the enrichment of linguistic communication increases the level of shared context. And third, people are capable of learning on the fly from their interactions. Putting the pieces together, the protocol makes it possible to iteratively improve on automatic translations by adding enough information to make detectable errors correctable, and by making previously undetectable errors detectable. In pilot experiments, Bederson and Resnik have established that volunteers using this protocol can work together to improve automated translations. The figure shows an example.

This work is not just about technology. Driving the technological research is a real-world problem: translation of books within the International Children's Digital Library project (ICDL; see http://www.childrenslibrary.org). The ICDL currently contains almost 5,000 books in over 60 languages, and it is working toward 10,000 books in 100 languages. Beyond the books themselves, the ICDL has an active user population that includes 1,000 volunteers with differing language skills who are interested in helping with translation, if a way can be found to help them do so. Participants at elementary schools in Mexico, Romania, Mongolia, and the U.S. will be working with Bederson and Resnik as early adopters for the new approach, supporting the ICDL's goal of enabling greater shared cultural understanding through this existing and growing resource.

The project is in its early stages, but initial results are promising. A pilot study used an early prototype to translate a page or two of a children's book from Russian to Chinese. When Russian speakers and Chinese speakers collaborated using the protocol, the results showed significant improvements over Google Translate – the process produced better Russian-Chinese translations, without a single human volunteer knowing both Russian and Chinese. Measuring the quality of the Chinese translations, the number of fluent translations increased from 8 (using just Google Translate) to 22, and the number of accurately translated sentences 7 to 19. (Fluency and accuracy were rated on a 5-point scale, and ratings of 4 or 5 were considered good.)

Bederson and Resnik along with their graduate student, Chang Hu, are refining the protocol and prototype, and will soon deploy it publicly on ICDL in order to to engage the volunteer base and combine the research with real-world translation of many, many books into many, many languages.

CS Undergrad Spotlight

Ederlyn Lacson is a returning undergraduate student in the department. She spent four years in the U.S. Navy as an Electrician's Mate and is currently working on a double major in Computer Science and Linguistics (Grammar and Cognition). Because of her educational background, Ederlyn has held an internship position with Microsoft for the past two summers in their Natural Languages Group, which has given her valuable practical experience. Ederlyn is still considering her post-graduation options as she has not yet decided if she will enter the workforce or add to her academic experience and attend graduate school.

In her spare time, she is a member of the service fraternity Alpha Phi Omega and the CS department's Association of Women in Computing.

Felicia Chelliah Wins Semi-Annual Staff Award

Felicia Chelliah has received the Department's fall 2009 staff award. Felicia was hired by Professor Emeritus, Jack Minker, in December 1985. Over the years, Felicia has split her work time between the business office and a variety of faculty members performing duties in support of their research programs. She has always maintained a positive attitude and has good rapport with faculty, students and staff members.

Felicia has lived in Lanham, MD for the past 26 years and she and her family, including her husband, son, daughter-in-law and daughter are active in church activities. This past summer they spent three weeks in India visiting two different sites (suburb of Chennai and Andra Pradesh) presenting seminars and distributing gifts to those in attendance (over 100 adults and 50 – 70 children at both locations). They also visited two schools for a week long program, seeing 700 students at one location and 900 students at another. This particular activity is a very special one for Felicia and she has been returning to the India Mission, on and off, since 1994.

During the remainder of the year, Felicia is involved in several additional ministry activities including visiting the homeless, monthly visits to the men and women's correctional institutions in Jessup, MD, visiting the Magnolia Nursing Home, a health and bible literature group, and volunteer work at a community food distribution center. She is a busy lady and her kindness has been noted by many. Felicia's husband enjoys gardening, which has residual benefits for staff members who enjoy the flowers that she brings into work throughout the year.

The Department extends its appreciation and best wishes to Felicia.

CS Welcomes:
4 new Research Associates
1 Fulbright Scholar

Avik Chaudhuri's research interests lie at the intersection of programming languages, logic, and security. He received his Ph.D. in 2008 from UC Santa Cruz, where he was advised by Martin Abadi. In his dissertation work, he developed a body of formal techniques for analyzing security in various state-of-the-art computer systems, including storage systems with distributed access control (such as NASD/OSD), file systems for untrusted storage (such as Plutus), and operating systems with multi-level security (such as Windows Vista and Asbestos). Applying those techniques led to finding several attacks and other security bugs in such systems, and provably correcting them. In 2009, Avik joined the Programming Languages group at the University of Maryland as a postdoc, where he is advised by Prof. Jeff Foster. He has since been involved in two main research projects: one, developing a program analysis tool to check security and correctness of web applications in Ruby on Rails; the other, developing a security verifying installer for mobile device applications in Android.

His non-academic interests include gourmet cooking and swimming.

Born and raised in Chattanooga, Tennessee, Julianne Chung graduated from Emory University in 2004 with a major in mathematics and a minor in dance and movement studies. Julianne received her Ph.D. in Computational Mathematics from Emory University in 2009. Her dissertation was on large-scale, ill-posed inverse problems arising in imaging applications, and her advisor was James Nagy. As a graduate student, she received a Department of Energy Computational Science Graduate Fellowship and conducted a summer research practicum at the Lawrence Berkeley National Laboratory. Currently, Julianne is working with Prof. Dianne O'Leary on developing numerical methods for polyenergetic digital breast tomosynthesis. She is a recipient of a National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship.

Lior Malka received his M.Sc. on secure communication and his Ph.D. on zero-knowledge protocols. In addition to his strong background in cryptography, Lior also has experience with Internet security and would love to collaborate on related projects. He is working with Prof. Jonathan Katz.

Before moving to Maryland, Lior lived in Vancouver, on the west coast of Canada, where he enjoyed rock climbing, running, and hiking. Lior loves adventure. He hiked and climbed mountains in remote corners of the world, including Patagonia, Nepal, Australia, New-Zealand, and Canada.

Lilyana Mihalkova is an NSF "Computing Innovations" post-doctoral fellow in the Department of Computer Science, working with Prof. Lise Getoor in the general area of artificial intelligence and machine learning. She received her Ph.D. in August 2009 from the University of Texas at Austin under the direction of Ray Mooney. Her thesis work focused on structure learning from multi-relational data, both from scratch and from transferred knowledge, and explored applications to social networking and Web personalization. In 2003, at the beginning of her doctoral studies, she was awarded an MCD Fellowship from the College of Natural Sciences at UT Austin. Her main research interests are in statistical relational learning, reasoning under uncertainty, and applications to Web-related problems. In her free time, Lilyana likes to read books in Bulgarian and enjoys swimming in the UMD pool.

Araz Yusubov joined the Department of Computer Science this past August as a Fulbright Visiting Scholar. In his home institution at Baku State University in Azerbaijan, he holds a position of Assistant Lecturer in the Department of IT and Programming under the Faculty of Applied Math and Cybernetics. Azerbaijan is a small country in south eastern Europe on the Caspian Sea about the same size as the state of Maine.

Araz received his bachelor's and master's degrees at Baku State University in 1997 and 1999, respectively. He obtained his doctoral degree in 2004, conducting research on an optimistic approach for concurrency control in distributed databases.

Lecturing at his alma mater since 1999, Araz has been working with different national and international organizations. He has

lead or participated in various educational projects, including the first Encyclopedia on Informatics for Children in the Azerbaijani language, the National Robotics Tournaments for school students using LEGO robots, and an interactive science project promoting active learning and teaching methods among science teachers in Azerbaijan.

Because of Araz's interest in furthering the development of Computer Graphics in his country, Araz is working with Profs. Dave Mount and Amitabh Varshney on a Computer Graphics curriculum project. His wife, Shahla, is also at the University of Maryland, College Park, pursuing her master's degree at the Maryland School of Public Policy.

Research Spotlight: Database Group

In recent years, we have seen a tremendous increase in the data available in digital format – the World Wide Web being a prominent example – and this trend is expected to accelerate with the increasing proliferation of devices, ranging from genome sequencing machines to microscopic biomedical sensors, that are capable of capturing even the minutest details of our everyday world. The database group at the University of Maryland at College Park carries out a multi-faceted and diverse research agenda addressing the full spectrum of data management challenges in today's information age. Some of the most important focus areas over the last few years include life sciences and biological databases, sensor networks, probabilistic databases, mobile databases, P2P networks, and unstructured text databases. At the same time, the database group has continued innovating in the traditional data management topics such as managing and querying data warehouses, spatial databases, query processing and optimization, data streams, approximate query processing, and data mining. Aside from the synergies in research interests among the group in areas such as data integration, probabilistic databases, and sensor networks, the database group also has extensive collaborations with the other groups in the department like computer vision, theory and the CLIP group.

The UMD Database group has a long and illustrious history that dates back to more than 25 years with the pioneering work by Jack Minker on deductive databases. In 1981, Nick Roussopoulos joined the group and led research on database systems, data warehousing, and spatial indexing. Around the same time, Hanan Samet turned his attention to Geographical Information Systems and Spatial Databases, and led several projects in these areas. The group was at its largest during the period 1985-2000 with the additions of Christos Faloutsos (1985), Leo Mark (1985), Timos Sellis (1986), Louiqa Raschid (1987), Ken Salem (1988), V.S. Subrahmanian (1989), Mike Franklin (1993), and Sudarshan Chawathe (1998). The group recently welcomed the additions of Lise Getoor in 2002 and Amol Deshpande in 2005. The Database group has consistently been ranked among the best in the world. Alumni from the group have gone on to faculty and industrial positions around the world, including AT&T Research, Arizona State University, Brown University, Georgia Tech., Google, IBM Almaden Research Center, IBM Haifa Labs, National Technical University of Athens, Purdue University, RPI, Seoul Technical University, UC Irvine, University of Athens, University of British Columbia, University of Pittsburgh, and University of Waterloo, to name a few.

Brief descriptions of the individual faculty research interests follow. More information about the members of the group and the projects can be found at the database group website: http://www.cs.umd.edu/db/.

Hanan Samet's research is a continuing effort to investigate the applicability of hierarchical spatial data structures to geographic information systems, computer graphics, image processing, image databases, and visualization. This work has culminated in the publication of the book "Foundations of Multidimensional and Metric Data Structures" published by Morgan-Kaufmann, an imprint of Elsevier, in 2006. This work also addresses algorithmic issues arising in applications such as the display of point cloud data, finding nearest neighbors in spatial networks like road maps, similarity searching in medical image databases like breast cancer images, and position-independent indexing for use in pictorially-specified queries on symbolic image databases. Hanan's research on integration of spatial and non-spatial data into a DBMS has resulted in the development of two systems: QUILT GIS, a working geographic information system and SAND, a home-grown

Database Group: (from left to right) Profs. Lise Getoor, Hanan Samet, V.S. Subrahmanian, Jack Minker (Emeritus), Amol Deshpande, Nick Roussopoulos, Louiqa Rashid

database system that allows specifying spatial queries graphically. He has also been developing the "STEWARD" system, a spatio-textual document search engine that is being deployed on the web site of the Department of Housing and Urban Development.

Nick Roussopoulos is interested in data storage reduction techniques using data aggregation (OLAP techniques), data correlation, and distributed data acquisition. This research has resulted in a data store called "Dwarf" for aggregating high dimensional data with deep levels of hierarchies in them. The Dwarf store algorithms discover and eliminate prefix and suffix redundancies and fuse exponential numbers of aggregates into very compressed Dwarf data cubes. Theoretical bounds on time and space complexity were published showing very low polynomial order although for most real life data sets, the complexity is linear in the number of records or dimensions. The Dwarf technology was recently patented (US 7,133,876). Nick Roussopoulos has also started a large effort in Data Virtualization that involves three research groups; Database Systems, Distributed Systems, and Networks. In contrast to Cloud Computing, Data visualization permits virtual data integration without colocating data from disparate sources, but provides access as if it were stored on a single data server. The goal of this effort is to provide a uniform virtualized data layer and the necessary plumbing for implementing a truly Service Oriented Architecture.

V.S. Subrahmanian is looking at the problems of extracting interesting information from large, unstructured, multilingual text collections. His group has developed a system called TREX ("The RDF EXtractor") that extracts RDF ontologies from text sources. TREX can take a set of URLs and a topic schema as input, and produce as output an RDF instance of the schema. For example, an application may wish to instantiate information about companies (e.g. number of employees, main plants, number of employees for each of these plants, and so on). This structural information is viewed as a schema. TREX currently processes about 50,000 URLs per day, and has been used to provide the US Army's 10th Mountain Division critical information prior to their deployment in Afghanistan. V.S. Subrahmanian and his group have also developed a system called OASYS ("Opinion Analysis System"), that takes a topic as input and tries to identify the intensity of opinion on that topic in document collections. OASYS, a winner of Computerworld Magazine's 2006 Horizon Awards for most innovative pre-commercial software of 2006, currently identifies opinions on arbitrary topics in 8 languages, from 16 countries, and has processed over 4 million news articles to date.

Louiqa Raschid addresses the challenges of data integration and performance for applications in the life sciences, Web data delivery, personalized medicine, humanitarian IT applications and Grid computing. Her research on tools for semi-automatic information extraction and mediation from Web accessible sources was one of the first projects to recognize the importance of non-traditional information sources. Projects on cost-based semantic query rewriting for Web sources with limited query answering capabilities, and wide area cost models for efficient query evaluation on the Web, extended traditional database query optimization and evaluation technology to the Web. The LSLinks project creates annotated hyperlinked data graphs to represent the complex knowledge of the annotated biological web (BioWeb). A variety of techniques including association rule mining, graph data mining, network analysis and ranking have been used to discover complex patterns

from the BioWeb. The ProMo project addresses the challenges of Web monitoring and data delivery. This includes satisfying complex profiles where clients require data from multiple sources to answer a query as well as the study of completeness versus timeliness trade-offs. The GeoNets project addresses humanitarian IT applications; this includes personalized ranking as well as online Blog Channel monitoring and topic tracking. She has also developed models for pricing resources and scheduling tasks on the computational Grid. Raschid is a founding member and database architect for Sahana - the leading free and open source disaster data management software.
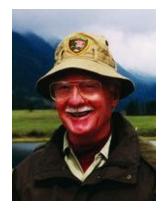
Lise Getoor's research interests are in machine learning and probabilistic reasoning applied to structured data (including relational data, semi-structured data and graph data). Her group develops theory and algorithms for statistical relational learning and link mining. Her group has developed algorithms for link-based classification, collective entity resolution and link prediction. The techniques developed are useful for many important database and information management problems including fundamental problems such as representation of uncertainty in databases, entity resolution, schema and ontology integration, privacy, information extraction and selectivity estimation. The domains in which their techniques have been applied include social networks, citation networks, email collections, geospatial data and biological sequences and networks.

Amol Deshpande's research has spanned a spectrum of data management topics in a variety of environments, including query optimization in traditional databases, adaptive query processing over data streams, sensor network data management, scalable statistical modeling of data, and uncertain data management. His current research efforts focus on the challenges in managing and querying the inherently imprecise, incomplete, and uncertain data generated in environments like sensor networks, data streams, data integration, information extraction, and social networks. Uncertainty arises in these environments for a variety of reasons. Sensor data typically contains noise and measurement errors, and is often incomplete because of sensor faults or communication link failures. In social networks and bioinformatics applications, the observed interaction data can often be very noisy, and predictions made by statistical inference add a further layer of uncertainty. Use of automated tools in data integration and information extraction can introduce significant uncertainty in the output. Many of these environments must also contend with large volumes of data that are generated continuously and that must be processed in real time. Amol and his group are developing data management tools and techniques to manage such data, by enabling declarative statistical modeling of streaming data, and by natively supporting uncertain data in relational database systems. They are also building a system that enables declarative analysis of very large information networks including social networks and biological networks.

Terps Place First in ACM Mid-Atlantic Progamming Contest

The Department's ACM team won the ACM Mid-Atlantic Programming Contest in early November and has advanced to the 2010 ACM-ICPC World Finals to be held in Harbin, China. The team is one of the top 100 teams out of 7,000 teams competing, representing 1,800 universities in 88 countries. The contest will be sponsored by IBM and hosted by Harbin Engineering University. The Finals are scheduled for early February 2010. The team includes CS undergrads Alan Jackoway, Mitchell Katz, and Matt McCutchen with coaching provided by Prof. Amol Deshpande

In Memoriam:

Professor Emeritus Harold P. Edmundson

Harold P. "Ed" Edmundson of Estes Park passed away on July 9, 2009 at the age of 87. Ed was born on December 13, 1921 to the late Ralph and Susan Edmundson of Los Angeles, California. After his father's death when Ed was just two, he and his mother moved to Hollywood. Ed later attended Fairfax High School where he excelled at mathematics and the sciences. His studies at UCLA were interrupted by World War II. During the war he served in the U.S. Army as a captain in the Pacific Theater working on breaking Japanese codes and ciphers. After the war, he returned to UCLA to finish his studies and complete his Ph.D. in mathematics. As a university student, Ed loved singing and fencing where he was a member of the UCLA Glee Club and rose to West Coast epee champion. Later he became a faculty sponsor for the UCLA horseback riding club and spent his weekends volunteering to teach horsemanship to Girl Scouts, the blind, and adults. While teaching riding, he met his future wife, Renate Lüdemann. In 1963, they were married in Pacific Palisades, California.

In the mid-1950s Ed worked at NSA and the RAND Corporation think tank. His interests were interdisciplinary and he always had an affinity for linguistics. Ed studied Russian, German and Japanese. He applied his linguistic skills to such projects as machine translation of Russian into English, automatic abstracting, and the Federal project to automate the Library of Congress. In addition, Ed taught mathematics at UCLA and lectured nationally and internationally. His career in industry included positions at TRW, SDC, and PRC.

In 1967, Ed transitioned to teaching full time. He moved to the East Coast when he was invited to be one the original members of the fledgling Computer Science Department at the University of Maryland. He held joint appointments in the computer science and mathematics departments, introducing new graduate and undergraduate programs. He particularly enjoyed mentoring students, both undergraduate and graduate. When not teaching, Ed enjoyed helping his daughter's Girl Scout troop earn outdoor badges and spending summers with his family in the West horseback riding and hiking. In 1991, Ed retired from the University of Maryland as Professor Emeritus and moved to Estes Park, Colorado.

In Estes Park, Ed proudly served more than 10,000 hours as a volunteer in Rocky Mountain National Park. He thought of this as his third career: being an Alpine Ambassador, manning stations at Wild Basin, Longs Peak, Bear Lake, Alpine Visitor's Center, and the backcountry office. He participated in the Bighorn Brigade, Elk Bugle Corps, and Chow Busters. In the winter, he co-led snowshoe nature walks for Park visitors. Ed felt his service to the Park was repayment for years of great outdoor experiences he had in national parks, including his family's yearly summer treks from Maryland to Colorado.

He will be greatly missed by his loving wife Renate, son Douglas of Longmont, Colorado, daughter Christine and son-in-law Tom White and grandchildren Zachary and Natalie White of Bridgeport, West Virginia. He is also survived by cousin Laura and husband John O'Connor, Bob Marshall, as well as numerous second cousins all of Southern California.

In The News...

■ The paper "Social Trust Based Web Service Composition", by Ugur Kuter and Jennifer Golbeck, won the Best Paper Award at the 8th International Semantic Web Conference (ISWC 2009).

■ Prof. Mike Hicks has been invited (and accepted) to serve on DARPA's ISAT panel.

■ Dr. Jorge Lobo has been elevated to the rank of Distinguished Scientist by the Association for Computing Machinery (ACM). Jorge received his Ph.D. in computer science in 1990 under the direction of Prof. Emeritus Jack Minker. Jorge currently works at the IBM T.J. Watson Research Laboratory.

■ Prof. Emeritus Marvin Zelkowitz gave a keynote talk on "The Science of Software Engineering" at the International Symposium on Empirical Software Engineering, Orlando, Florida, October 15-16, 2009.

■ The International Children's Digital Library was named a winner of the 2009 Digital Education Award which recognizes exceptional web sites and projects focused on K - 12 and higher education.

■ Randy Baden, Adam Bender, Prof. Neil Spring, Prof. Bobby Bhattacharjee, and Daniel Starin received the SIGCOMM 2009 Best Student Paper Award for their paper "Persona: An Online Social Network with User-defined Privacy."

■ A paper by Kutluhan Erol and Profs Jim Hendler and Dana Nau has received an honorable mention for the ICAPS Influential Paper award, which was awarded at the ICAPS-2009 conference in Greece during September.

■ Prof. Dana Nau gave a keynote talk in September at KI-2009, the annual German Conference on AI.

■ NetGrok, a tool for visualizing computer networks in real-time, was featured in a cover story on security visualization for the September 2009 issue of Linux Magazine.

■ Jian Li, Barna Saha, and Prof. Amol Deshpande received the VLDB best paper award for their paper, "A Unified Approach to Ranking in Probabilistic Databases".

■ Profs. Abhinav Gupta's and Larry Davis' recent CVPR 2009 paper which on described storylines of videos, was featured in an IEEE Spectrum article and on the front-page of Discovery Tech News. The paper describes a technique to automatically generate blurbs describing the plays of the baseball game.

■ Prof. Hanan Samet is the winner of the University Consortium for Geographic Information Science (UCGIS) Research Award for 2009.

■ Jandelyn Plane, Sr. Lecturer was selected as the 2008-2009 Provost's Faculty Academic Advisor of the Year.

■ The paper "Using Histograms to Better Answer Queries to Probabilistic Logic Programs" by Matthias Broecheler, Gerardo Simari and Prof. V.S. Subrahmanian has been named the recipient of the Best Student Paper Award at the 2009 International Conference on Logic Programming held in Pasadena, CA in July 2009.

■ Nicholas Chen, one of Prof. Francois Guimbretiere's students, is the recipient of the 2009 Google Fellowship in Human-Computer Interaction.

■ Prof. Mike Hicks and his former student, Iulian Neamtiu, were quoted in an MIT Technology Review article on a company developing "live" updating for Linux.

■ Prof. David Jacobs' work on recognizing trees from iPhone pictures has been described in a CNN Science-Tech blog post.

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