INSIDE CS

Department of Computer Science

SPRING 2006

Notes from the Chair

by

Prof. Larry Davis

Welcome to the Spring 2006 edition of the Computer Science Newsletter. The Department is very excited about the recently released rankings of computer science departments and sub-disciplines by U.S. News and World Report. Our Department was ranked 13th nationally; more important, for the first time ever our Department's programs were rated in the top 25 in Programming Languages (16), Systems (18) and Theory (22). As usual, our AI program was ranked in the top 10 (9), but overall our Department's foundation of excellence is much broader than it was in the past.

Emeritus Professor Jack Minker played a major role in establishing the Department's prominence in AI during his long career at Maryland. Jack was recently honored as the recipient of the ACM/AAI 2006 Allen Newell Award. This is a very prestigious award given for career achievements in computer science. Jack made foundational contributions to automatic theorem proving and was the founder of the field of deductive databases. He was also a relentless proponent for scientists' human rights and was instrumental in helping some key Soviet scientists obtain their exit visas to immigrate to the West.

The Department recently held its Annual Awards Ceremony. You can view the list of those who received awards and special recognition by going to our website - http://www.cs.umd.edu. Select "Recent awards and accomplishments." Three of our faculty members, Profs. Hanan Samet, Ben Shneiderman, and Pete Stewart, celebrated their 30th anniversary at College Park. Ben Shneiderman has provided a personal retrospective for this issue.

The Department held its bi-annual faculty retreat over Spring Break and identified a number of exciting enhancements to its undergraduate and graduate research programs. Be on the lookout for a description of our new undergraduate track in games and simulation. Meanwhile, we introduced a minor in CS this Fall and already have 10 students enrolled.

Enrollment in computer science is down nationally, and we're also experiencing severe enrollment declines at Maryland. The percentage of women in CS programs is declining even faster. To help combat this, Nelson Padua-Perez, a Lecturer in the Department, has developed a year-long program to get young women interested in Computer Science. This is our very successful Java Passport Program which attracted over 40 young women to the campus last summer; by popular demand Nelson extended the program to the academic year – teaching beginning, intermediate, and advanced courses on Saturdays and Sundays throughout the Fall and Spring semesters!

Congratulations to Brenda Chick for winning the Annual Staff Award. Brenda has been a valued member of the Department for a long time (she asked me not to reveal how long!). We're happy to welcome two new staff members to the Department. Ken Knudson started in January and is providing administrative computing support, and Heather Ettus will be joining us in July to work in the Chair's Office.

Maryland Day, held the last Saturday of April, typically sees 10,000-20,000 people visit the campus for entertaining introductions to our education and research programs. This year, Yaser Yacoob from UMIACS displayed his SimonBot system – a robot that combines computer vision and artificial intelligence to play "Simon Says" with children. It was a great success.

Finally, the Department recently opened two new facilities in the building. There is a new graduate student lounge on the first floor (operated jointly with UMIACS, Electrical and Computer Engineering, and the Institute for Systems Research) with input from graduate students as a place to relax and talk about research (as well as play foosball). And, there is a new GRID video teleconferencing room on the third floor that Jeff Hollingsworth worked very hard to design and bring online.

CS Welcomes Jennifer Golbeck

Dr. Jennifer Golbeck is a Research Coordinator for the new Joint Institute for Knowledge Discovery and a Research Associate in UMIACS. She is also teaching a new class in Computer Science this spring on Web Design and Programming. Prior to beginning this work, she was a Ph.D. student at Maryland, and completed her dissertation work last spring under advisor Jim Hendler.

Her main research interests are in trust, social networks, and web intelligence. She is currently studying how users of web-based social networks determine how much they trust other people, and how that can be used within applications. Some of her current projects using trust include the development of recommender systems,

and for nonmonotonic reasoning with default rules to create web policies. More generally, she is interested in how participation in online communities can be harnessed to create applications that are "intelligent" with respect to users' social contexts. This year, in recognition of her work, Jennifer was named as one of the "Top 10 People to Watch" by IEEE Intelligent Systems Magazine.

Outside of her research, Jen is usually training for and running marathons. She spends most of her time with her two golden retrievers, Pi and K, and volunteers with local animal rescue groups.

Research Spotlight: Theoretical Computer Science

Theoretical Computer Science (TCS), broadly speaking, is concerned with understanding the very nature of computation: What problems can be solved by computers? And how efficiently can such problems be solved? TCS encompasses research in such diverse areas as complexity theory, algorithms, cryptography, distributed computing, machine learning, and more; the common thread is a focus on precise models and rigorous mathematical analysis of particular problems within those models.

We have a strong group of faculty actively working in this area. We also have a large number of students who are encouraged to get involved early by attending weekly TCS reading groups run by the group. See **http://www.cs.umd.edu/areas/Theory/** for further details. Brief descriptions of faculty research interests follow.

Bill Gasarch is interested in complexity theory and TCS-at-large; his most recent research has been in the area of communication complexity and applications of combinatorics to problems in this area. To get a flavor for this type of research, consider the following problem: Alice holds as input an n-bit string A, while Bob holds as input an n-bit string B. Alice and Bob want to determine whether or not their strings are equal. Clearly, there is the trivial solution in which Alice sends all of A to Bob; is there a better protocol that communicates fewer bits? What is the minimum number of bits they need to exchange in order to solve the problem? Besides their inherent beauty, problems of this type have ties to other areas of TCS (e.g., proving lower bounds on computational efficiency of certain problems) and possible practical applications as well (e.g., minimizing resource-intensive communication in sensor networks).

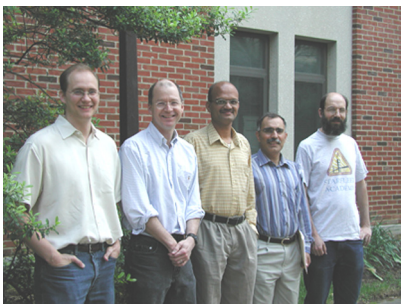
Jonathan Katz focuses primarily on cryptography and, more generally, those aspects of computer security that can be precisely modeled and formally reasoned about. His research has spanned a wide range of topics, from work on theoretical foundations of cryptography (e.g., analyzing protocols for secure distributed computation), to the design of efficient cryptosystems with novel properties (e.g., ``anonymous signatures'' and identity-based encryption), to studies of secure algorithms for peer-to-peer and wireless sensor networks. Amazingly and sometimes counter-intuitively, it is possible to construct cryptographic solutions that can be proven secure against arbitrary (yet efficient) attackers as long as certain problems, such as factoring, are as "hard" as is commonly believed.

Samir Khuller's research centers around the design of efficient graph algorithms and approximation algorithms for NP-hard problems. Recently, one specific research project of Samir's has dealt with algorithms for storage and movement of data; this work has applications to large multimedia data storage systems. Some of the principal challenges that arise in this context are: (a) deciding how many copies of each data item to store, (b) determining the exact layout of data on a set of servers, and (c) dealing with changing workloads and dynamic data access patterns, all while seeking to maximize access to the data. More recently, Samir has also been working on developing algorithms for finding "cheapest paths" that incorporate actual costs (think: gas prices) and not just distances.

Clyde Kruskal recently solved a problem in geometric combinatorics related to ``colorings'' of the plane (A coloring of the plane is simply a color assignment to each point in the plane). Consider the statement: in any 2-coloring of the plane there exist two points of the same color exactly 1 inch apart. This is true (and easy to prove). It is also true for 3-colorings, but false for 7-colorings. The cases of 4,5, and 6 are open, though Erdos conjectured that 4 is the maximum value for which the statement is true. Clyde has looked at the problem in restricted regions of the plane showing, for example, that a 2-coloring of a (small) square exists in which there are no points of the same color exactly 1 inch apart.

Dave Mount's interests are in algorithms and data structures for fundamental geometric problems such as nearest neighbor searching, point location, robust estimation, and clustering. His research is aimed at developing realistic and practical algorithms that can be employed in areas such as pattern recognition, information retrieval, and data analysis. To take one example: Earth scientists are presented with huge data sets generated by multiple instruments; making sense of such massive amounts of data is a challenging task. Dave has been working on algorithmic tools for dealing with these data sets. Some of the approaches include (a) clustering data; (b) registering (or aligning) data sets collected from different instruments; and (c) fusing data from various sources to enhance their overall quality and reliability. So far this work has resulted in a new and highly efficient version of the popular ISOCLUS clustering algorithm that runs 10 to 30 times faster than existing implementations.

The work of Aravind Srinivasan lies generally in the area of randomized algorithms. His research has focused most recently on probabilistic models and algorithms in epidemiology, networking, and combinatorial optimization. Examples include: models for disease-spread in large urban areas, and efficient algorithms to control such spread; information-dissemination in unstructured peer-to-peer networks; estimating the capacity of wireless networks; and approximation algorithms for scheduling problems.



Jonathan Katz, Dave Mount, Aravind Srinivasan, Samir Khuller and Bill Gasarch

2005 Annual Staff Award Recipient
Brenda Chick

Brenda Chick was selected to receive the Department's Annual Staff Award for calendar year 2005. She began her employment with the Department in December 1995 serving first as a Receptionist and then being promoted to Administrative Assistant and Executive Administrative Assistant to the Department Chair in April 2003.

In her current position of Facilities Coordinator, Brenda is responsible for maintenance and security in the classroom building (CSIC) as well as three floors of office and lab space in the A.V. Williams Building. She also handles phones, keys, renovation projects, management of the mailroom and coordination of a high school programming contest held once a year. Brenda's knowledge of Department activities has enabled her to perform her job and help a variety of faculty, staff, and students along the way. In making the selection for the award, the Committee stated, "Brenda has been willing to take on multiple responsibilities and she presents a positive Department image to the many people she interacts with outside of our Department. She is a friendly face to everyone in Computer Science and UMIACS and she is always willing to help."

The Staff Awards Program promotes service of the highest caliber to the Department. Special thanks to all of those who participated in the nomination process and, to Brenda, for being selected to receive the 2005 staff award.

Jack Minker Wins
2005 Allen Newell Award

Professor Emeritus Jack Minker is the 2005 winner of the prestigious Allen Newell Award of the Association for Computing Machinery (ACM) and the American Association for Artificial Intelligence (AAAI). The ACM/AAAI Allen Newell Award is presented to an individual selected for career contributions that have breadth within computer science, or that bridge computer science and other disciplines. This endowed award is accompanied by a prize of $10,000, and is supported by the American Association for Artificial Intelligence, and by individual contributions.

The citation associated with the award cites Minker for his "fundamental contributions to the fields of deductive databases, logic programming, artificial intelligence, and, more generally, logic-based methods in Computer Science and for his truly unprecedented role in organizing and stimulating scientific discourse." The Newell Award was first presented in 1994 to Frederick P. Brooks, Jr., and subsequently to other outstanding individuals such as Joshua Lederberg, Judea Pearl, and Carver Mead.

Jack is a leading authority in artificial intelligence (AI), deductive databases, logic programming and non-monotonic reasoning. He is one of the founders of the area of deductive databases and one of the first to define the field. He has contributed to theories of semantic query optimization and cooperative and informative answers for deductive databases. Tools developed in deductive databases have been incorporated into relational database technology. Jack is considered the founder of disjunctive databases and developed a theoretical basis that handles negated data. He developed the concept of the Generalized Closed World Assumption (GCWA), in which one can conclude when it is reasonable to assume that the negation of an atomic formula is true in disjunctive theories. He extended the theory of logic programming to include disjunctive logic programming. Together with his students, Jack developed denotational, model, and proof-theoretic semantics for disjunctive logic programs and proved that each of the semantics yields the same result. Work in the theory of disjunctive logic programs has been extended to cover the case of stratified and well-founded disjunctive logic programs. He wrote *Foundations of Disjunctive Logic Programming,* which he co-authored with two of his students, Jorge Lobo and Arcot Rajasekar. The book addressed an important topic of reasoning in knowledge bases with incomplete information. He has made numerous other technical contributions, written over 150 papers and edited and authored 6 books. As noted by Dr. Michael Gelfond who nominated Minker for the award, "Minker belongs to a small group of researchers who noticed and nurtured the deep and non-trivial connections between the four sub-areas of computer science – databases, logic, artificial intelligence, and logic programming. Even in this group, which included such luminaries as John McCarthy and Ray Reiter, Minker was distinguished by the breadth of his vision which included all four areas."

With respect to Jack's influence on his fields of research, Teodor Przymusinski, who seconded Jack's nomination states, "Jack played a truly unprecedented role in organizing and stimulating scientific discourse, exchange of ideas and promotion of new concepts. He organized three major conferences and each one of them has had a profound scientific impact. The 1977's workshop on deductive databases, organized jointly with Herve Gallaire and Jean-Marie Nicholas, and the resulting book "Logic and Databases" is considered to be the birthplace of the whole area of deductive databases. His 1986's Conference on the Foundations of Logic Programming and Databases provided a huge boost to research on interrelations between logic programming, deductive databases

and non-monotonic reasoning. For a long time, proceedings of this conference have been considered to be a virtual bible for anyone doing research in this area. His last workshop on Logic-Based Artificial Intelligence, organized with John McCarthy, also proved to be a highly influential scientific event."

Jack is an internationally recognized leader in the field of human rights of computer scientists. He currently serves as Vice-Chair, Committee of Concerned Scientists, 1973 to present, and was Vice-Chair, Committee on Scientific Freedom and Human Rights (CSFHR) of the ACM, 1980 - 1989. Jack considers his most important work to be in human rights. He led the struggle in the computer community for the release of Anatoly Shcharansky and Aleksandr Lerner from the former Soviet Union. Anthony Ralston, who was Chair of the CSFHR, said of Jack's work, "The four ACM reports on computer scientists whose human rights had been violated that were published in the Communications of the ACM from 1981 to 1989 were landmarks in the fight to secure the rights of computer scientists, particularly in the Soviet Union. There really is just no question but that Jack Minker has contributed more – far more – over the past third of a century to the human rights of computer scientists than any other computer scientist."

The Department of Computer Science was formed out of the Computer Science Center in 1973, and became a new academic department in the newly formed Mathematical and Physical Science and Engineering Division. Jack was appointed the first Chair in 1974. The start of the department led to a large increase of undergraduate students. Jack's objectives as Chair were to: (1) Stabilize the Education Program which he achieved by setting the standards and requirements for PhD students, and assuring that the large influx of undergraduate students did not overwhelm the faculty research while assuring excellence in education and teaching; (2) Develop a Research-Oriented Department and Hire Research-Oriented Faculty by focusing on research, easing service requirements for junior faculty and providing an environment to perform research. He hired such outstanding faculty as Dana Nau (Duke); Dianne O'Leary and Hanan Samet (Stanford); Pete Stewart (Tennessee); and John Gannon and Satish Tripathi (Toronto). During his tenure as Chair (1974-1979), the National Academy of Sciences ranked the Department among the top 12 computer science departments and the top 6 state universities in the United States. Following his chair, he served as Chair, Advisory Committee on Computing to the National Science Foundation (NSF) from 1980-1982. His committee was instrumental in computer science becoming a division separate from mathematics and thereby allowing it to flourish as a separate discipline, and encouraging the NSF administration to authorize the NSF internet service that linked universities over the net.

Jack `retired' in 1998 and is now Professor Emeritus. During his retirement he continues to make contributions to the life of the Department and the University. Among the things he has done is to write a definitive history of how computing and the Department of Computer Science started at Maryland.

*Allen Newell (March 19, 1927 — July 19, 1992), in whose memory the award is given, was one of the pioneers and giants in artificial intelligence (AI) from its inception to the time of his inopportune death. For details on the many contributions made by Newell, see the Biographical Memoir by Herbert A. Simon, (**http://fermat.nap.edu/readingroom/books/biomems/anewell.html**).*

A 30 Year Retrospective: Creations = Relations + Inspirations

by

Ben Shneiderman

When a university functions smoothly as a trusted community of scholars, ideas are challenged, innovations are spawned, and successes are celebrated. I was attracted to the University of Maryland community because of a unique interdisciplinary commitment to psychological studies of computer users. A pivotal moment was when Prof. Azriel Rosenfeld invited me to create a lab within his interdisciplinary Center for Automation Research. Rosenfeld was already an impressive figure whose diverse accomplishments inspired me, so his confidence in me was much appreciated. The Human-Computer Interaction Lab (HCIL) opened in 1983 and became a lively place for collaboration with psychologists, educational technology researchers, biologists, and others. Prof. Kent Norman (Psychology), who taught me much about experimental design and statistics, has remained an important partner and an always-willing mentor for students.

During these formative years of the late 1980s, Prof. Gary Marchionini in the College of Library and Information Services (now College of Information Studies) became a close partner in developing, evaluating and applying our hypertext prototypes that became an inspiration for the hot links of the World Wide Web. We created the first electronic scientific journal with the July 1988 issue of the Communications of the ACM that presented 8 papers from a key hypertext conference. Gary shared my devotion to working on important problems that respond to societal needs, while conducting innovative basic research. We've continued to collaborate on the National Science Foundation's Digital Government Initiative, where our project goal is to help citizens "Find what you need; Understand what you find" from the web sites of 70+ government statistics agencies.

My work life at UM was dramatically improved in 1987 when Dr. Catherine Plaisant joined the HCIL as a Research Scientist. Our 50+ joint publications are marked by a happy collaboration and deep professional respect for each other. If Catherine disagrees with me, which she does regularly, I make sure to listen carefully, as she has thought about our work in a fresh and fruitful way.

Another key colleague has been Prof. Jack Minker, who deserves recognition for his research and leadership of the Department, but most of all, his distinguished efforts on behalf of human rights for computer scientists left a deep impression on me. He made the

points that science is part of society and that we are responsible for our colleagues.

In recent years, my greatest accomplishment was bringing Ben Bederson and Allison Druin to UM. Their enthusiasm, energy, and capability, coupled with great ideas motivate me to do better in my work. We share a devotion to shaping technology and applying it in ways that can make the world a better place. These themes fit well in the interdisciplinary Institute for Advanced Computer Studies (UMIACS), which now houses the HCIL. My wife, Jennifer Preece, also shares this devotion to meaningful causes; she inspires me with her research on online communities and as a trusted source of professional wisdom plus daily doses of empathic support.

Ben Bederson's remarkable software engineering skills reminds me of the great software implementers that I have had the pleasure to work with. All the grad students I worked with were excellent programmers and software architects, but a few stood out for their capacity to take an idea and forge it into a working interface, sometimes overnight. Doctoral students Harry Hochheiser and Jinwook Seo both impressed me with their prolific, diverse, and thoughtful implementations.

Two collaborators also showed stunning capacities for making great software happen: the first was Chris Ahlberg whose two summer projects on dynamic query sliders coupled to scatterplots laid the basis for his forming Spotfire with his friends. Our joint paper in the ACM CHI 1994 conference is one of the most frequently referenced papers in the human-computer interaction literature. The second was Martin Wattenberg whose clever extensions to my treemap concept (nested rectangle to represent hierarchies) were elegantly included in the award-winning Marketmap. One of the best paper writing processes I ever participated in came from working with Bederson and Wattenberg to explore five treemap algorithms for their visual appropriateness, machine execution speeds, and human comprehensibility (ACM Transactions on Graphics, 2002). I was pleased to endorse both Ahlberg and Wattenberg for the MIT Technology Review Top 100 Young Innovators, where they appeared in 2002 and 2003 respectively. My final tribute to great programmers goes to the remarkable Don Hopkins, who as an undergraduate during 1984-90 developed pie menus, contributed to our hypertext work, and prototyped a dozen other great ideas. Don has gone on to other success stories such as helping to develop The Sims, the most successful game software ever.
Among the great satisfactions of working at UM is the start of each semester when I read the roster of students in my class. The diversity of national origins and cultural communities inspires me to reach every student, to work with them as individuals, and to get them to produce projects they never thought they could do. I smile broadly when thinking of the published papers in professional conferences and journals with undergraduate and graduate students.

A recent student comment captures all I need to say about why I do what I do: "Your influence changed my academic experience from one of just fulfilling requirements to one of gaining a mature understanding of the state of the art in computer science and an appreciation for the academic community, both in its methodology and ultimate contributions. I have gained more from my degree than I could have understood was possible when I began, and I could not have done it without your help and encouragement."

Another part of my job that I enjoy is traveling to give the 40-50 lectures I do each year, and the 100+ conference keynotes I've done in my career. A gratifying response to one such lecture is also the kind of reward that keeps me going: "That one lecture you gave opened my eyes and totally changed my approach to designing the way individuals would interact with my software and how I organized application development. Your approach, with follow up study on my part, filled in what was missing after which came success."

Working with great students and colleagues makes every day a thrill. Working on socially important projects, wrestling with tough intellectual problems, and generating strong innovative papers keeps me going. I've been fortunate to have capable students and colleagues, a challenging environment, and good health during my years at University of Maryland. It's great to look back and give thanks, but I'm also confident that my best work is yet to come.

The Marmoset Project: An advanced project testing framework

CS Graduate Student Jaime Spacco

Marmoset is an innovative system for handling the tasks of student programming project submission and testing. Inspired by Professor Bill Pugh, Marmoset developed out of an effort to reinvent the Department's introductory programming curriculum. According to Pugh, graduate student Jaime Spacco has done almost all of the implementation, and worked out a good deal of the architecture and design. Jaime has been funded from some previous gifts from Sun Microsystems and IBM, but they have only recently received a gift from Google where they actually proposed doing work on Marmoset as part of their research proposal to Google.

The framework provides significant technical, motivational and pedagogical advantages over traditional project submission and grading systems, and in particular helps students strengthen their skills at developing and using testing. Briefly, students are given limited opportunities to release test their code. When students perform a release test, they are told the number of, and names of the first two release tests they failed. For example, for a poker game project, students might be told that they passed five (5) release tests, but failed four (4), including FullHouse and Four Of A Kind. Performing a release test consumes a release token; students are typically given two (2) or three (3) release tokens for each project. Each release token regenerates 24 hours after use.

By limiting their access to release tests, students are encouraged to write their own test cases and reason about why their project might be failing or should be correct. Students also receive feedback on whether they are on the right track and are encouraged to start work on the project early (so they have more opportunities for release testing). Students and instructors can also be provided with additional information, such as issues found by static analysis tools and gaps in code coverage by student-written and public test cases.

Instructors can view live summaries of student progress as students work on the project. Days before the assignment is due instructors can learn which test cases students are having the most trouble with, which might indicate a topic that needs to be discussed in lecture, an ambiguous specification, or perhaps a faulty test case.

Marmoset works with multiple programming languages, although some features, such as integrated code coverage analysis, are currently only implemented for Java.

Marmoset also provides a rich data set of information about how students learn to program. We've been running Marmoset since the fall of 2004, and have a research database of over 200,000 source snapshots and 2 million test runs.

Demo, papers and more information available at:
http://www.cs.umd.edu/~jspacco/marmoset/

Fig. 1 A Student View

Project 1: Poker Game

Deadline: Fri, 11 Feb at 11:00 PM (late deadline: Sat, 12 Feb at 11:00 PM)

Alan Turing: cs132001

Submission #31, submitted at Fri, 11 Feb at 01:34 AM

Test Results

type	test #	outcome	points	name	short result	long result
public	0	passed	9	PlayingWithAFullDeck	PASSED	

You received 9/9 points for public test cases.

You passed all the public tests, so this submission is eligible for release testing.

Click here to release test this submission

You currently have 3 release tokens available that regenerate 24 hours after being used.

Project 1: Poker Game

Deadline: Fri, 11 Feb at 11:00 PM (late deadline: Sat, 12 Feb at 11:00 PM)

as of 11:00 PM	Feb 12	Feb 11	Feb 10	Feb 09	Feb 08	Feb 07	Feb 06
PlayingWithAFullDeck	126	125	99	81	60	47	38
IsDeckShuffled	126	125	98	81	60	47	38
Flush	120	119	89	69	52	40	33
FourOfAKind	119	118	88	71	55	38	28
ThreeOfAKind	116	115	85	68	52	41	30
Pair	119	117	83	66	48	38	30
TwoPair	114	113	86	68	49	39	32
FullHouse	117	114	88	67	50	41	30
Straight	108	105	77	65	43	33	27
StraightFlush	115	113	86	71	45	35	28

Fig. 2 Instructor Historical View

Computer Science in Rwanda and Afghanistan - a USAID Project

Both Rwanda and Afghanistan have been devastated by decades of war and economic depression, with one consequence being the inability of computer science departments located in these two countries to develop. Unfortunately, this has occurred during the period when significant growth in computer science technology, research, and education has occurred in many parts of the world. To help reverse this situation, Jandelyn Plane, an Instructor in our Department, has been an active participant in the reconstruction of computer science departments in both countries since 1999. Through the Center for International Development and Conflict Management (CIDCM), within the college of BSOS (1999-2004), and CIDCM and the Center to Bridge the Digital Divide, located at Washington State University (2005-present), USAID has funded projects to assist in the rebuilding and strengthening of computer science departments at universities located in Rwanda and Afghanistan.

Jan has traveled to both countries meeting with university ministers, administration, faculty and students to develop curriculum requirements, design and teach courses, instruct on pedagogical methods and assist faculty members with masters' thesis proposals. She has also developed a UNIX operating system course composed of 40 DVDs and requisite teaching materials which is currently being used at several universities in Africa and Afghanistan. Jan will soon return to Kabul University where she will work with computer science faculty to bring CS faculty from other Afghani universities to Kabul for a two-day workshop to focus on building stronger academic ties and the exchange of ideas.

Jan believes that the knowledge that she has acquired while working in these countries as well as her doctoral work in education has improved her own teaching and curriculum activities within the department. Jan is in the process of writing her dissertation proposal; she intends to explore the under representation of women in the computer science discipline both in the United States and in Afghanistan.

Pete Stewart:

Distinguished University Professor

As this newsletter was going to press we learned that Pete Stewart has been selected as a Distinguished University Professor. This is the first person in our Department to be awarded this honor by campus. We thought you would enjoy reading a brief summary of his work and the impact it has had on the general area of numerical analysis through his many seminal contributions to matrix computations, an area that is fundamental to all branches of science and engineering. Pete's contributions have been recognized by three prestigious honors. He received the F. L. Bauer Prize, awarded by the Technical University of Munich, in 1998. In 2004, he was elected to the National Academy of Engineering, cited "for development of numerical algorithms and software widely used in engineering computation." Also in 2004, he was named a "Distinguished Editor" of the Journal Linear Algebra and Its Applications.

During his distinguished career, Prof. Stewart has made significant contributions to the following areas:

Mathematical Software. Pete was one of the LINPACK authors, creating the first portable library for solving linear systems of equations and computing matrix decompositions. Its success can be partially judged by the fact that the User's Guide became the all time best seller for SIAM, and by the number of later packages modeled after Linpack.

Matrix Algorithms. Pete produced a steady stream of new matrix algorithms, several of which changed the way computations are done. For example, together with Bartels, Stewart introduced the first stable direct method for solving equations of the form AX – XB = C, and with Moler, he derived the first stable algorithm for the generalized eigenvalue problem Ax = / Bx. Another major contribution is the introduction of a method for detecting near singularity, a method that became the LINPACK condition estimator. These algorithms are now widely used in control theory, signal processing, and other areas.

Error Analysis. Pete's work in rounding error analysis of numerical analysis has been seminal, showing how to extend results to problems for which it was not believed possible. For example, his analysis of downdating broke new ground and is widely cited, and his analysis of subspace iteration, an important method for sparse eigenvalue problems, is the definitive one.

Perturbation Theory. Pete's analysis of invariant subspaces of Hermitian matrices and its generalization to subspaces associated with generalized eigenvalue problems and singular value decompositions is definitive. He was the first to investigate the stability of matrix decompositions, a line of research that has subsequently flourished.

Prof. Stewart's publications are prolific, having published 8 books and 120 papers. In addition to his major research contributions, Prof. Stewart has published a highly successful textbook on matrix computations, an authoritative book on perturbation theory with J-G Sun, and two sets of class notes which have been praised widely. He also has been concerned with the roots of his subject, and has published articles surveying aspects of its history in the nineteenth and early twentieth centuries. He has published a translation from Latin and German of Gauss' later works on least squares, and translations of historically important papers as technical reports. He is currently undertaking a five volume survey of matrix algorithms; the first two volumes are already considered the definitive references on matrix decompositions and eigensystems. All these contributions bear the distinct mark of a truly outstanding scholar.

In The News....

- Lise Getoor and her student Indrajit Bhattarcharya's paper, "A Latent Dirichlet Model for Unsupervised Entity Resolution," was selected as the best research paper for the SIAM Data Mining 2006 Conference.

- Marvin Zelkowitz was the keynote speaker at the Prince George's Area School Science Fair, April 2, 2006.

- Steven Salzberg, CS and CBCB, was featured in the latest edition of Science & Society. He discussed potential medical breakthroughs from the Human Genome Project, sequencing human and avian influenza flu viruses, individualized genome sequences, and genome assembly.

- Ben Bederson, CS, UMIACS, had an article about his new software, PhotoMesa, displayed on TMC.net on March 8 and an additional article was written about the digital picture software in the Baltimore Sun on March 9.

- Laveen Kanal, CS, gave invited talks to the Computer Society of India in Bangalore, the Center for Development of Advanced Computing, in Pune, Adobe India Ltd. in Noida (Delhi) and IBM India Research Laboratory in Delhi. The topic of his talk was "Beyond e-Reading: Knowledge Organization and Dynamically Personalized e-Learning." He also gave invited talks at Yahoo India in Bangalore and to students in Business, Economics and Engineering at Delhi University.

- Haixia Zhao, a recent HCIL Ph.D. student, has won the American Association for University Women Award (College Park Chapter) for the best dissertation research for 2006. Haixia will receive a cash award and inscribed silver platter. Her advisors are Ben Shneiderman and Catherine Plaisant. Haixia's research was funded by the National Science Foundation. She is now working at Google.