INSIDE CS

Department of Computer Science

NOTES FROM THE CHAIR
BY
PROF. LARRY DAVIS

The fall semester 2007 is well under way, and there are a lot of Department activities to report on. Most significantly, Profs. Vic Basili and Marv Zelkowitz retired this past summer, although happily both are still working as Research Professors on a variety of sponsored research programs. There was a retirement dinner on October 5, followed by a wonderful workshop on software engineering the next day at which eight leading researchers in software engineering spoke about their work, and the contributions that Vic and Marv made during their careers. Slides from the talks are available online at *http://webapps.cs.umd.edu/sse07/presenters.php.* Pictures from the reception can be viewd at *http://www.cs.umd.edu/special-events/sse-2007/.* There are also articles on Vic's and Marv's careers in this newsletter.

We welcomed one new faculty member to the Department this fall – Prof. Carl Kingsford, who was a research scientist in our Center for Computational Biology. Carl completed his graduate work at Princeton. An article follows which describes his background and research interests.

This year, the Department has been involved in an informal arrangement with Sichuan University in Chengdu, China that was coordinated with the assistance of Prof. Michael Ma, Entomology and the Institute for Global Chinese Affairs.

The Department hosted several faculty members from the computer science department at Sichuan, who spent one year in the Department participating in research projects and learning about our educational programs. Our visitors arrived in February 2007 and joined our vision and software engineering research groups. In August Prof. Ma led a group of computer science faculty on a visit to Chengdu to present research talks, meet future faculty visitors and interview prospective graduate students. The group consisted of Profs. Davis, Deshpande and Duraiswami. The visit was a fantastic success both technically and culturally. An article on the trip follows in this newsletter.

This academic year we will be busy with faculty recruitment. There is one more position in computational biology that we hope to fill, and the search for the Minker Chair continues with some candidates scheduled to visit the campus in early 2008. Additionally, we are searching for a new junior faculty member in natural language processing to further strengthen this nationally recognized research group.

University of Maryland Software Day will be held at the Riggs Alumni Center on January 18, 2008. Details can be found at *www.cs.umd.edu/softwareday*. In order to decrease the newsletter's publication cost, we are bringing you our news via email. Let us know what you think and we hope that you enjoy the following articles.

IN FOCUS:
VIC BASILI

Prof. Emeritus Victor R. Basili has been a Professor of Computer Science at the University of Maryland, College Park (since 1970), where he served as Chairman from 1982 to 1988. He founded the Fraunhofer Center for Experimental Software Engineering – Maryland, where he served as Executive Director from 1998 - 2004. Vic was also one of the founders and principals in the Software Engineering Laboratory (SEL) at NASA/GSFC (1976 - 2001).

Prof. Basili received a B.S. from Fordham College and an M.S. from Syracuse University both in Mathematics. He holds a Ph.D. in Computer Science from the University of Texas at Austin. He is a recipient of the Laurea Honoris Causa in Informatic Engineering from the University of Sannio in Italy (2004) and an Honorary Ph.D. in Natural Sciences (dr.rer.nat h.c) from the University of Kaiserslautern in Germany (2005).

Prof. Basili has been working on measuring, evaluating, and improving the software development process and product for over 30 years. Methods for improving software quality include the Goal Question Metric Approach (GQM), a method for defining and interpreting measurement data, the Quality Improvement paradigm (QIP), an evolutionary engineering approach that uses measurement and feedback loops to evolve processes based upon their effects in practice, and the Experience Factory organization (EF), a learning organization for the software industry. Vic has worked on the development of experience bases for a variety of applications, including the development of HEC codes.

Methods for improving software development include the Iterative Enhancement Life Cycle Model, an incremental development approach that builds the next increment based upon analysis of the previous increment, and the development of scenario based reading techniques for evaluating various software artifacts including Perspective Based Reading (PBR) for reading

requirements documents. Methods for cost estimation include the meta-model for resource estimation, and Optimized Set Reduction OSR for building empirical models of cost and schedule.

Prof. Basili has developed, tailored, evaluated and evolved these techniques for several organizations. He has taught courses on this material both at the University and for specific organizations. Vic has also worked with many organizations, including AT&T, Boeing, Daimler-Chrysler, Ericsson, FAA, GE, GTE, IBM, Lucent, MCC, and Motorola and has been a grant recipient from NSF, NASA, AFOSR, ONR, AFOSR, AFRL, DARPA, IBM, Burroughs, Hughes, VITRO, NEC, Finseil, Amdahl, Coopers and Lybrand, Toho Gas, Ricoh, Mutsuhito Panasonic, Sogei, Daimler Benz, Bellcore, and. Fujitsu.

Prof. Basili is a recipient of a 1989 NASA Group Achievement Award, a 1990 NASA/GSFC Productivity Improvement and Quality Enhancement Award, the 1997 Award for Outstanding Achievement in Mathematics and Computer Science by the Washington Academy of Sciences, the 2000 Outstanding Research Award from ACM SIGSOFT, and the 2003 Harlan Mills Award for the IEEE Computer Society. In 2005 there was a Symposium held in his honor: Foundations of Empirical Software Engineering: Legacy of Victor R. Basili at the 27th International Conference on Software Engineering (ICSE 2005), St. Louis, MO, consisting of speeches by colleagues. A book of selected papers by Professor Basili was published by Springer in May 2005. In 2007 he was awarded the Fraunhofer Medal.

Prof. Basili has authored over 250 journal and refereed conference papers, has served as Editor-in-Chief of the IEEE Transactions on Software Engineering, and as Program Chair and General Chair of the 6th and 15th International Conference on Software Engineering, respectively. He is an editor of the Journal of Systems and Software, and a founding co-editor-in-chief of the Journal of Empirical Software Engineering, published by Springer. Vic is also an IEEE and ACM Fellow.

In Focus:
Marvin Zelkowitz

Prof. Emeritus Marvin Zelkowitz has been a Professor of Computer Science at the University of Maryland, College Park since

1971. He was Associate Chairman for Education from 1982-85 and Associate Chairman for Facilities from 1986-87. Marv had a part-time faculty appointment at the National Bureau of Standards (now called the National Institute for Standards and Technology) from 1976 through the end of 1997, when he left NIST to join Dr. Basili to form the Fraunhofer Center for Experimental Software Engineering. At Fraunhofer he served as co-Director from 1998 through 2002. He became Chief Scientist of Fraunhofer from 2003 until he left Fraunhofer in June of 2007. He was also one of the founders and principals in the Software Engineering Laboratory (SEL) at NASA Goddard Space Flight Center (GSFC) (1976 - 2001).

Prof. Zelkowitz received a B.S. in Mathematics from Rensselaer Polytechnic Institute in Troy, NY and an M.S. and Ph.D. in Computer Science from Cornell University in Ithaca, NY. He is a Fellow of the IEEE, recipient of the IEEE Computer Society Golden Core Award and the 2000 ACM SIGSOFT Distinguished Service Award, as well as several ACM and IEEE Certificates of Appreciation.

Prof. Zelkowitz has been involved in environment and tool development, measuring the software process to understand software development technologies, and understanding technology transfer. He was first interested in diagnostic tools, building the PLUM PL/1 diagnostic compiler at the University of Maryland in the early 1970s and the SUPPORT language-based editor for Pascal on an IBM PC in the 1980s. For most of his 37 years at the University of Maryland he has been working with Vic Basili on measuring software development technologies at the NASA SEL, at the Fraunhofer Center, and with several other government agencies (e.g., software for high dependability with NASA in the early 2000s and high performance computing with DARPA from 2003 through 2007).

Prof. Zelkowitz has authored over 150 conference, book chapters and journal papers. He is the co-author of two textbooks, *Software Engineering and Design* in 1979 with Alan Shaw and John Gannon, probably the first software engineering textbook ever to be published, and *Programming Languages: Design and Implementation* (editions 3 and 4 in 1996 and 2001) with Terry Pratt, which has been translated into German, Russian, Japanese and Spanish. He is series editor of Elsevier's *Advances in Computers* book series since 1994 and is on the editorial board of Springer's *Empirical Software Engineering*. He previously was editor of Ablex's book series in software engineering and was on the editorial boards of the IEEE *Transactions on Software Engineering and Elsevier's Computer Languages, Systems, and Structures*.

Prof. Zelkowitz is a past chair of ACM SIGSOFT and of the Computer Society's Technical Committee on Software Engineering. He was chair of the Computer Society's SoftFair 2 Conference in 1985, program co-chair of the 18th International Conference on Software Engineering in 1996, program chair of the 1996 International Conference of the Chilean Computer Society, program chair of the 5th International Symposium on Software Metrics in 1998, and general chair of the 4th International Symposium on Empirical Software Engineering in 2004, as well as positions on numerous other conference and workshop committees.

Prof. Zelkowitz is on the Board of Directors of the National Capital Area Skeptics, where he has served several terms as both

secretary and president. Since July 1, he has tried to find more time to work on his model railroad, a goal so far unrealized.

Research Spotlight: Software Engineering

The Software Engineering Group has focused in two areas, experimentation and quality assurance.

The group is a strong believer in empirical study and experimentation. Empirical software engineering involves the scientific use of quantitative and qualitative data to understand and improve the software product, software development process and software management. Its history has been in isolating problems faced by software organizations in developing and analyzing systems, identifying or proposing solutions, and empirically validating if, when, and where the solutions are effective. The approaches involve observation, model building, and experimentation. This has been the mode of operation from the 1970's, exemplified by the work at award winning NASA Goddard Space Flight Center's Software Engineering Laboratory (Basili and Zelkowitz), where improvement was made in the software development process and product.

Over the years there have been numerous objects of study from general software development methods like inspections and cleanroom development to specific techniques like perspective based reading for software requirements and design, state based testing for GUIs, and message passing models for high end computing. The domains of interest have included high end scientific applications on parallel machines, ground support software for satellites, business applications, telecommunications, software development tools and general web applications.

The methods applied have varied from controlled experimental designs such as factional factorial designs and replicated studies to quasi-experimental designs (case studies) to qualitative studies (grounded theory, structured interviews, and surveys).

Specific projects currently underway include:

High Productivity Computing Systems (HPCS): Basili, Zelkowitz
HPCS is about building sufficient knowledge through empirical studies about high end computing to improve the time and cost of developing these codes. The underlying theme is to improve productivity by reducing the time to development. Activities include the development of theories, hypotheses, and guidelines that characterize, evaluate, predict and improve an HPC environment (hardware, software, human). The work is related to the development of the new peta-scale computers supported by DARPA.

Unified Model of Dependability (UMD) - Basili
UMD is a failure-centered framework for eliciting and modeling trust and quality requirements. It addresses the need to clearly understand and describe what quality attributes a system should possess, a difficult and often neglected aspect of requirements. The framework was originally developed based on the experience gained through the NASA High Dependability Computing Project. The synergy resulting from integrating trust and quality requirements on the basis of the modeling concept of failure greatly benefits stakeholders in clarifying their needs, and improving both trust and quality requirements elicitation.

Event-based System testing - Memon
The main focus is the development of models and techniques for automated software quality assurance (SQA). To date, several contributions to the field of testing event-driven software (EDS) have been realized. A significant problem with model-based testing of EDS is that the models are difficult to obtain; they are typically state-machine models created manually. Moreover, it is resource intensive to maintain the models and test artifacts (e.g., test cases, test oracles - mechanisms that determine whether a test case passed/failed) during (frequent) software updates. Because the class of EDS is so diverse, the project concurrently focuses on four sub-classes of EDS (web applications, graphical user interfaces (GUIs), network protocols, and middleware), reaching different levels of research maturity and making various contributions with each sub-class. This work is supported by NSF, and the Office of Naval Research (ONR); the research is also being extended to automated testing of service-oriented architectures (SOAs) with the help of Accenture Technology Labs in Chicago.

Software Quality Assurance Testing - Porter
A new approach to quality assurance (QA), called Distributed, Continuous Quality Assurance has been developed by Prof. Porter and his graduate students. Inspired by volunteer computing projects such as SETI@Home and Folding@Home–which distribute pieces of enormous scientific computations to computers spread across the world– this effort is redesigning traditional QA analyses so they can be efficiently run across extensive grids of computing resources, volunteered by worldwide developer and user communities, in a distributed and continuous manner. This approach greatly improves the quality and speed of QA processes, gives developers greatly expanded insight into system performance on diverse runtime environments and workloads, and allows efficient, coordinated and transparent execution of very large scale QA processes. This work is support by the NSF, the Office of Naval Research (ONR), and DARPA and is being applied in developing collaborations with several high profile open source projects such as MySQL and JBoss Messaging, and with developers at leading IT companies such as Cisco, Raytheon and Lockheed Martin.

Model –Based Testing - Cleaveland
Project focus is the development of effective automated techniques for assessing whether embedded-control software is behaviorally compliant with specifications given for an executable model. The

work is motivated by the increasing importance of modeling in embedded-software design flows in the automotive, aerospace and medical-device industries. The specific modeling notations being worked with include Simulink® and Stateflow®, although the general principles apply to other notations, provided they have precise execution semantics. Our approach relies on the generation of test cases in the form of sequences of input vectors from models, with the goal of providing full coverage of the modeling constructs according to adaptations of traditional source-code coverage metrics such as statement coverage to the modeling arena. The work has been supported by NSF, ONR, the Fraunhofer USA Center for Experimental Software Engineering Maryland, and Robert Bosch USA, Inc.

Flexible High Quality Design for Software – Basili, Shull

The goal of this NSF-funded work is to predict the likely outcomes of proposed changes to a given software design, so that tradeoffs involved in making changes can be understood. UMD is collaborating with the Fraunhofer Center as well as Mississippi State University using the following methods: mining information from repositories of tracked changes from open source, commercial, and government projects to generate hypotheses; testing these hypotheses on small-scale studies in universities to refine them and build confidence; and finally applying them to larger scale industrial projects to demonstrate their feasibility.

Information-hiding URLs - Sazawal

Many common elements of URLs do not adhere to the principle of information hiding. For example, filename extensions and parameter names can reveal volatile implementation details. As a result, when website implementations change, links between pages break. Bookmarks and code that generates URLs often break as well. An information-hiding URL uses an alias to identify a web resource and appends parameter values into the hierarchical structure of the URL. If a programmer follows certain conventions, such as providing default values for parameters, a link defined using an information-hiding URL will not break even if certain details about the page have changed.

Computer Science Ranked Number Two

In the June issue of Communications of the ACM, "an internationally recognized magazine of the computing field" published by the Association for Computing Machinery, the Department of Computer Science was ranked second best in the nation based on our faculty's publication rate and their participation in professional computer science conferences.

Our computer science program was surpassed only by the Massachusetts Institute of Technology, the long-time leader in the field. Other institutions ranked within the top five were Carnegie Mellon University, Georgia Institute of Technology and Stanford University. The 2006 rankings by U.S. News & World Report rated our computer science program 13th among all U.S. universities and 6th among public universities.

CS Welcomes Carl Kingsford

Assistant Professor Carl Kingsford began his appointment in Computer Science in July 2007. Carl received a B.S. in Computer Science from Duke University in 2000, and a Ph.D. from Princ-

eton University in August 2005. His research interests lie within several areas of computational biology.

While a graduate student, Carl focused on computational problems involving proteins. He developed methods for predicting the three-dimensional shape of a protein from its amino acid sequence, for designing novel proteins, and for inferring protein function from its evolutionary history. Prior to joining the faculty, Carl was a postdoc in the Center for Bioinformatics and Computational Biology within UMIACS. While there, he began to develop algorithms to analyze genomic sequences. In particular, he studied how bacterial genomes are organized and how the influenza virus evolves. He is currently continuing the study of the flu virus and also investigating networks of interactions between proteins.

In his free time, Carl enjoys photography, skiing, kayaking, and running. We are delighted to have him as a member of our department.

David Jacobs Wins Honda Research Initiation Grant

Carlos Castillo, a graduate student in CS, and his advisor, Prof. David Jacobs, have been working on building algorithms that can

recognize peoples' faces when their position changes relative to a camera. For example, to automatically sort personal photos based on the people in them, one has to determine whether a person seen in one picture is the same as a person seen in another photo who might be facing in a different direction. Similarly, a robot or a security system might photograph someone looking at a camera, but then have to recognize them later when they are looking elsewhere. While commercial face recognition systems achieve good performance when people are facing the camera, it remains a challenging research problem to handle variations in face viewpoint.

To compare images of faces taken from different viewpoints, one needs to find a good correspondence between pixels. For example, a comparison will only work if the nose is compared to the nose, and the eyes to the eyes. Castillo and Jacobs have achieved good correspondence results by comparing images using algorithms originally designed for stereo vision. In stereo, one measure 3D information using two pictures taken from nearby viewpoints, just as we use our two eyes to see in 3D. These algorithms match pixels in the two images using constraints on the possible changes in position of the images of points that can occur when camera position changes. However, while stereo algorithms use these matches to then perform 3D reconstruction, Castillo and Jacobs' algorithm uses these matches simply to compare two images, to measure the similarity of the two faces. This approach has produced the best published results on a standard test set of face images produced by Carnegie Mellon University.

This work has been supported by a grant from Apptis Inc. Jacobs has recently been awarded a Honda Research Initiation Grant to further explore these problems. For example, as a person moves relative to the camera, they also move relative to the light, which can also cause large changes in their appearance. Honda is particularly interested in these problems because they are building a humanoid robot, ASIMO, which recognizes people.

THE HUMAN LANGUAGE TECHNOLOGY CENTER OF EXCELLENCE

Prof. Bonnie Dorr will join researchers at Johns Hopkins University to establish a new Human Language Technology Center of Excellence, to be based at Hopkins' Homewood campus in Baltimore. The center focuses on the development of software to analyze texts and to flag information of interest. Dorr's research on semantic representations and language understanding will provide a foundation for text analysis in multiple languages, specifically for relating events and entities across topically-related documents.

Dorr will collaborate with researchers at Johns Hopkins as well as with her colleagues at the University of Maryland, Douglas Oard (UMIACS, CLIS), Philip Resnik (UMIACS, Linguistics), and Amy Weinberg (UMIACS, Linguistics) on research related to language understanding. One of Dorr's first projects will involve semantic annotation texts-with researchers from Carnegie Mellon University, BBN Technologies, Columbia University, and UMBC-and subsequent investigation into automatic techniques for semantic analysis.

Maryland's experience with multilingual processing, semantic analysis, and language understanding will be central to the development of techniques for processing documents on a large scale, at different levels of representation. There are many potential end applications for the results of the center's research, including automatic summarization, machine translation, and question answering.

RAY MILLER HONORED IN BEIJING

Ray Miller, Professor Emeritus, attended the 15th annual IEEE International Conference on Network Protocols (ICNP) in Beijing, China on October 16-20, 2007. At the conference banquet, held at the restaurant that invented the "Peking Duck" dish, he was honored and presented with a trophy "For Founding Contributions to the IEEE International Conference on Network Protocols". Miller assembled the initial ad-hoc committee aimed at starting this conference about 17 years ago, and acted as its Chair. This committee then became the initial ICNP Steering Committee with Miller serving as its chair for the first five years, where he continues as a member. This year was the first time that ICNP was held in China, but in addition to it being held at various locations in the U.S., it has been held in Japan twice and once each in Paris and Berlin. In 2008, ICNP will be held in Florida at a Disneyworld hotel. Further information about ICNP can be found at its web site:
 http://www.ieee-icnp.org/

FACULTY VISIT CHINA

During the week of August 20, three faculty members, Profs. Larry Davis, Amol Deshpande and Ramani Duraiswami, visited two of the leading universities in China. The first, Sichuan University, is located in the centrally located Chinese city of Chengdu.

Chengdu is one of the largest cities in China, although it does not feel overcrowded. The city has fantastic restaurants (including the famous hot pot restaurants) which the group was taken to nightly for extensive banquets. There was also time for some sightseeing, including visits to the Panda reserve, an ancient irrigation project and an astounding archeological site on which the Chinese have built a stunning museum to display the artifacts unearthed at that location.

During the past year an informal relationship between our department and the computer science department at Sichuan has developed, with faculty from Sichuan staying in College Park for up to one year to learn about our research and education programs. During their stay in Chengdu, the Maryland faculty met with Sichuan faculty and students, and gave a series of lectures on their research projects.

The group also spent a couple of days in Guangzhou, a major financial center close to Hong Kong, visiting Southeast China Technical University (SCUT). This is another excellent university with a large and diverse computer science program. As everyone knows, the national bird of China is the construction crane, and Guangzhou has more than its share of these birds. The group was taken on a tour of a new University town where all of the colleges and universities in Guangzhou are building new facilities. The buildings and grounds are all very impressive; the laboratory facilities available to computer science and computer engineering undergraduates are far better than those available almost anywhere in the United States. Vast laboratories of specialized equipment for courses in networks, graphics, and security have been built. Special funds have been put aside to encourage undergraduates to become involved in entrepreneurial software development projects – one student won a $100,000 prize for a social networking program. A return trip to SCUT is being planned in March 2008 to meet with additional faculty and students.

IN THE NEWS...

■ Prof. Atif Memon has been invited to serve on a National Academy ofSciences Panel as an expert in the area of Computer Science and Information Technology, for the Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID).

■ Congratulatoins to Affiliate Prof. Rama Chellappa for receiving the Oustanding Research Award from the A. James Clark School of Engineering.

■ Congrats to Affiliate Prof. Uzi Vishkin on being named an "Innovator of the Year" by the Baltimore Daily Record. See *http://www.umiacs.umd.edu/~vishkin/XMT/Innovator%202007%20lo.pdf* for the story.

■ The First International Conference on Computational Cultural Dynamics was held here on campus from August 27-28. Advances in computer technology can now aid researchers in gathering data about different cultural groups, learning the intensity of opinions that those groups have on various topics, and building and extracting models of behavior. Development of such models blends the behavioral and social sciences with technological fields. Currently, many of these research communities are largely unconnected. The purpose of the conference was to bring them together to help forge a common understanding of principles, techniques, and application areas.

■ Prof. Lise Getoor gave a keynote talk at the Fifth International Workshop on Mining and Learning with Graphs, in Florence, Italy on August 2, 2007.

■ Prof. Bobby Bhattacharjee, Pete Keleher, Aravind Srinivasan, and CS graduate students Vijay Gopalakrishnan and Ruggero Morselli, received the best paper award at the 14th Annual IEEE International Conference on High Performance Computing for their paper on "Distributed Ranked Search."

■ Ben Bederson, was the winner of one of the three Brian Shackel Awards for "Outstanding contribution with international impact in the field of HCI" at the INTERACT 2007 conference in Rio de Janeiro on September 12. His winning paper was entitled, "Thumb-Space: Generalized One-Handed Input for Touchscreen-Based Mobile Devices."

■ Prof. Larry Davis, and Son Tran, CS graduate student, won the Best Paper Award for their paper "Object Tracking at Multiple Levels of Spatial Resolutions" at the International Conference on Image Analysis and Processing, held in Modeno, Italy September 11-14.

■ Julian Mestre's paper, "Adaptive Local Ratio", was selected Best Student Paper for SODA 2008. Julian recently received his Ph.D. in August.

■ Prof. Aravind Srinivasan and his co-inventors have been awarded a U.S. patent on fault-tolerant routing of data in networks.

■ Jessica Chang, who recently finished her undergraduate degree, will present her paper "Broadcast Scheduling: Algorithms and Complexity" at the ACM-SIAM SODA conference in San Francisco in January 2008.

■ Yuan Yuan's work entitled "UnChannelize the Channels in WLANs" won second prize in the ACM Student Research Competition held at MobiCom 2007.

■ Prof. Amitabh Varshney delivered a joint plenary keynote on "Visualization and Persuasion" at the Symposium on Volume Graphics and Symposium on Point-based Graphics Sep 2 - 4.

■ Prof. Aravind Srinivasan was an invited speaker at the SAGA 2007 conference held at ETH Zurich. Jessica Montgomery was selected to receive the Department's Semi-Annual Staff Award for the period January through June 2007.

■ Prof. Prof. Lise Getoor give an invited talk at the 3rd Workshop on Combining Logic and Probability at the University of Kent, Cantebury, UK.

■ Prof. Jonathan Katz was invited to give a tutorial entitled "A Survey of Modern Cryptography" at ACM Sigmetrics 2007..

■ In August, Profs. Adam Porter and Atif Memon presented their research entitled "Automated Software Quality Assurance and Model-based Test-case Generation" at the 2nd Google Test Automation Conference. Video of the presentation can be found at **http://www.youtube.com/watch?v=OiE9zRPD6ps**

■ Prof. Prof. Aravind Srinivasan was an invited speaker at the SAGA 2007 conference held at ETH Zurich.

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■ Richard (Matt) McCutchen won a GOLD medal at the International Informatics Olympiad. He placed 9th overall.

■ Profs. Adam Porter and Atif Memon presented their research entitled "Automated Software Quality Assurance and Model-based Test-case Generation" at the 2nd Google Test Automation Conference.

■ Lise Getoor gave an invited talk at the 22nd National Conference on Artificial Intelligence in Vancouver, BC. Growing interest in treemap visualizations for hierarchical data (electronic product catalogs, sales analysis, manufacturing quality control, supply chain supervision, etc.) have led to a successful licensing agreement for HCIL's Treemap 4.1 program to the HiveGroup, Inc.. The license, arranged by the UM Office of Technology Commercialization, brings $108,000 over three years and ensures that treemaps will be applied to a wide variety of applications. The treemap algorithm was originally developed by Ben Shneiderman, refined in collaboration with Catherine Plaisant, and later extended in cooperation with Ben Bederson.

■ HCIL's early successes with information visualization was accelerated during the summer visits of Christopher Ahlberg who worked under Ben Shneiderman's guidance during 1991 and 1993. One of the two key papers published in the 1994 ACM CHI Conference became the most widely referenced HCI paper, according to CiteSeer. Ahlberg formed Spotfire in 1996, and as CEO led it to a 200-person company, which was bought during summer 2007 by TIBCO. The HCIL-inspired Spotfire product is used by most pharmaceutical companies for drug discovery and genomic data analysis, and is increasing adopted for business intelligence analysis for oil/gas discovery, manufacturing control, marketing, supply chain management, and financial analysis. Ben Shneiderman participated in the formation of Spotfire and was on its Board of Directors 1996-2001.

■ Julian Mestre has received a postdoctoral fellowship from the Humboldt Foundation.

■ Mihai Pop has been invited to give a keynote address at the "Finishing in the Future" conference held in Santa Fe, NM, in June 2007. The conference is co-organized by Los Alamos National Laboratory and the Joint Genome Institute of the US Department of Energy.

■ Jonathan Katz was invited to give a tutorial entitled "A Survey of Modern Cryptography" at ACM Sigmetrics 2007.

■ Atif Memon gave a keynote address, "Testing Event-driven software" at the International Conference on Information and Communication Technologies (ICICT Pakistan), held October 2007 in Karachi, Pakistan.

■ Vic Basili and Atif Memon ranked in the "Top 50 software engineering scholars", while the Maryland Software group ranked 4th in a recent article in Communications of the ACM, which details a framework for ranking institutions and researchers based upon publications. These rankings are based on a select set of marquee journals in software engineering over the years 2000 though 2004.

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