HARRIS GATEWAY TO LEARNING AND INNOVATION INAUGURATED IN THE COMPUTER SCIENCE AND ENGINEERING BUILDING

Harris Corporation recently gave $3 million to create an endowed research fund called the Research Excellence Fund in Computer Science and Engineering. In recognition of this gift, the department has named space on the 3rd floor, now known as the Harris Gateway to Learning and Innovation. The Harris Gateway seeks to address three major challenges that are faced by the CISE Department. According to the Harris Corporation Gateway proposal that led to this gift, first, it seeks to arrest the decline in student enrollment by investing in cutting-edge research and creating an environment that encourages collaboration. Second, it will
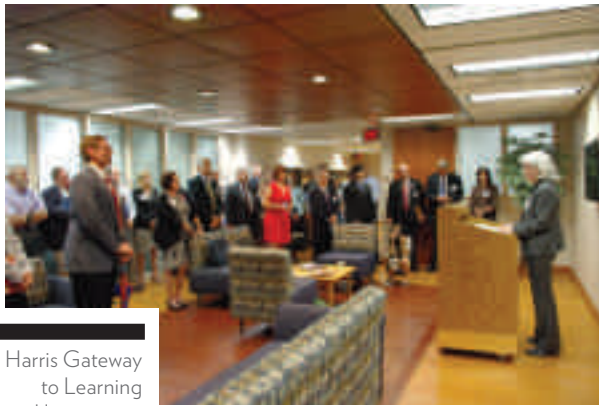
Harris Gateway to Learning and Innovation: A place to thrive

help retain and recruit top talent within the faculty by providing early support for promising young faculty. Finally, it will enable collaboration between Harris Corporation and the University of Florida at even greater heights, and strengthen the Harris Corporation brand among CISE students, faculty and the greater Gator com-

munity. In addition, we anticipate future collaboration with visiting faculty from Harris. In recognition of this generous gift, the entrance and main lobby of the CISE Department has been renovated. The distinct entrance, name and ambience has created an updated look and use of the space, and has been designed as a space for "intellectual collision" – a natural and comfortable space for the 1100 students, 40 faculty and the many guests who mingle after labs or class. All major on-campus Department sponsored events, including hosting for faculty candidates and the prospective students and their families will be held in the Harris Gateway. □

> HARRIS CORPORATION RECENTLY GIFTED $3 MILLION TO CREATE AN ENDOWED RESEARCH FUND AND RENOVATE OUR 3RD FLOOR, NOW CALLED THE HARRIS GATEWAY TO LEARNING AND INNOVATION.
> ● ● ●

SONG, KAHVECI, AND RANKA WIN BEST STUDENT PAPER AWARD AT ACM INTERNATIONAL CONFERENCE ON BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

UF CISE Ph.D. student Bin Song and her co-supervisors Professor Tamer Kahveci and Professor Sanjay Ranka received the Best Student Paper Award for their research paper titled "Enzymatic target identification with dynamic states" at the ACM International Conference On Bioinformatics and Computational Biology (ACM-BCB), held at the Niagara Falls, NY on August 2nd - 4th, 2010.

In their paper, they developed a novel approach for predicting the most desirable enzyme knockouts in a given metabolic network. Metabolic networks consists of a complex network of reactions that transform chemical compounds. The reactions are catalyzed by biomolecules, called enzymes. By knocking out a set of enzymes, it is possible to change the production rate of some of the compounds in

the metabolism. This problem has many critical applications, many of them in biotechnology such as biomedicine and bioenergy. For instance it is possible to modify the metabolic networks of bacteria that generate ethanol in their metabolism and increase the ethanol production rate significantly.

The fundamental contribution of this paper to metabolic engineering is that it models the metabolism in

UF UNIVERSITY *of* FLORIDA

FACULTY NEWS

MANUEL E. BERMUDEZ / *associate professor* / was keynote speaker at the XVIII Congreso Nacional de Estudiantes de Ingeniería de Sistemas, CONEIS, held on August 2-6, in La Universidad Nacional del Callao, Perú. Dr. Bermudez has also been appointed the Program Committee Chair for the LACCEI 2011 Conference (Latin American and Caribbean Consortium of Engineering Institutions), to be held on August 2-5, 2011 in Medellín, Colombia. Dr. Bermudez received a $15,000 grant from Info tech for his project titled "Hybrid Tools for Infrastructure Construction Business Intelligence".

TIM DAVIS / *professor* / was invited to give the keynote speech at SCEE '10 held in Toulouse, France from September 19-24, 2010.

ALIN DOBRA / *associate professor* / received a $302,911 grant from Rice University for his project "III-COR-Medium: Design and Implementation of the DBO database."

ALIREZA ENTEZARI / *assistant professor* / received a $334,276 grant from National Science Foundation (NSF) for his project "CIF: Small: multidimensional Signal processing with Box Splines". Dr. Entezari also received a grant of $85,000 from NSF for his project grant "G&V: EAGER: Exploring Compressive Sampling for Extreme-Scale Data Visualization."

PAUL GADER / *professor* / received a grant of $648,907 grant from NGIA for his project "Probabilistic Hyperspectral & LIDAR Fusion".

ABDELSALAM HELAL / *professor* / delivered a keynote speech titled: "The Cloud, The Edge and Beneath," in the 18th Annual Meeting of the IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, held in Miami, Florida from August 17-19, 2010. He also delivered a keynote speech titled: "Programming Pervasive Spaces," in the 7th International Conference on Ubiquitous Intelligence and Computing held in Xi'an, China from October 26-29, 2010. He has also been invited to give an opening keynote in the Second International ICST Conference on Sensor Systems and Software (S-Cube), to be held in Miami, Florida from December 13-15, 2010.

BENJAMIN LOK / *associate professor* / will serve as the program chair of IEEE Virtual Reality Conference to be held in Singapore from March 19-23, 2011. Dr. Lok received a $1,833,293 grant from National Institute of Health (NIH) for his project "Neurological Exams teaching & Evaluation Module using Virtual patients."

PRABHAT MISHRA / *associate professor* / was appointed General Chair of the IEEE High Level Design Validation and Test Workshop held in Anaheim, California June 10-12, 2010. Dr. Mishra served as the Program Committee Track Chair in the ACM/IEEE International Conference on Hardware Software Codesign and System Synthesis held in Scottsdale, Arizona from Oct. 24-29, 2010. He served as a guest editor for the Springer Journal of Electronic Testing for the year 2009 - 2010.

JIHKWON PEIR / *associate professor* / received a grant of $195,000 from Intel for his project "Memory Hierarchy Studies on Many-Core CMPs with Large On-Die Storage."
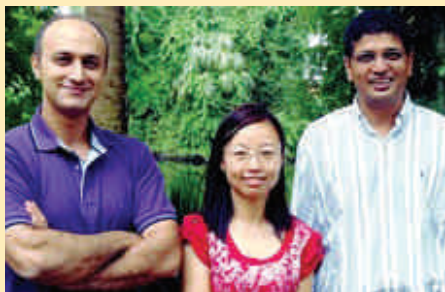
SANJAY RANKA / *professor* / served as the Co-General Chair of the International Conference on Green Computing, held in Chicago, IL from August 15 - 18, 2010. He also served as the Program Chair of the International Conference on Contemporary Computing held in Noida, India from August 9-11, 2010. He was a Senior Program Committee Member for ACM Conference on Information and Knowledge Management held in Toronto, Canada from Oct. 26-30, 2010. He served on the Editorial Board of IEEE Transactions on Parallel and Distributed Computing, Editorial Borad of Sustainable Computing: Systems and Informatics, and the Editorial Board of, International Journal of Computing.

SARTAJ K. SAHNI / *chair & distinguished professor* / was awarded $10,000 from HPTi for his project "Assessment of Double Precision GPU as Computational Platforms". Dr. Sahni also received a grant of $124,857 from AFRL for his project "Sahni- Energy-Efficient High-Performance Internet Routers". He also received a NSF grant of $249,786 for his project "NeTS: Medium: Collaborative Research: Building an Intelligent Uncertainty-Resillient Detection and Tracking Sensor Network".

BABA VEMURI / *professor* / served as the co-chair of the Medical Imaging: Perspectives on Perception and Diagnostics conference held in Delhi, India on December 9-10, 2010. He was also a plenary speaker at this conference.

a biologically realistic way. When a metabolism is altered, its state — in other words, the set of fluxes of all of its reactions — changes dynamically until it reaches to a steady state. This paper considers the entire trajectory of fluxes, called the dynamic state, in order to decide the best set of enzyme knockouts. To solve this problem, the paper addresses two key issues. First, it answers the question of how to compare whether two dynamic states are similar. The second issue arises from the nature of the dynamic state. Finding the dynamic state after knocking out a set of enzymes can be computationally very expensive depending on the remaining network. Furthermore, this needs to be repeated for many possible enzyme knockouts. The paper develops smart algorithms to avoid this computation whenever possible or to cut down its cost when it cannot be entirely eliminated. The resulting algorithm generates hundreds of enzyme knockout predictions at an impressive speed ranging from several seconds to hours. It takes anywhere from days to months to perform small number of enzyme knockouts in wet lab. As Tamer Kahveci says "Considering the entire dynamic state is crucial in making successful enzyme knockouts. What happens between the initial and the final state of the metabolism may be a matter of life or death for the organism." ▫

UF PROGRAMMING TEAM CONTINUES ITS TRADITION OF SUCCESS

Led by team captain Joe "Hua" Thuemler and vice-captain Willie Maddox and coached by Dave Small, the UF programming team is once again making a name for itself in the major collegiate competitions.

IEEEXTREME 4.0: UF WINS FIRST PLACE IN THE WESTERN HEMISPHERE/14TH IN THE WORLD

In the IEEEXtreme 4.0 competition, a 24-hour programming marathon, team GitWizards (consisting of Joe Thuemler, Mauricio Bell'Albero, and Preston Mueller) were first in the entire Western Hemisphere and 14th place in the world. At this time only the top 25 finishers have been announced, but we expect that a couple other UF teams will also place in the top 100 (755 teams from universities around the world participated in the event).

ACM/ICPC SOUTHEAST USA 2010 REGIONALS: UF WINS SECOND PLACE.

At the ACM International Collegiate Programming Contest (ICPC) Southeast Regional Contest, UF had three teams in the top 20, with Irrelephant UF (Joe Thuemler, Mauricio Bell'Albero, and Jason Fisher) taking second place and tying UM for the most problems solved [interestingly, UM, placed 16th in the IEEEXtreme]. We are hopeful that that UF will once again be invited to compete in the World Finals.

The ACM/ICPC is the oldest and most prestigious of all the contests in which we compete. It's conducted in two phases: first are the regional contests, from which one hundred top teams are selected to advance to the second phase: World Finals. The Southeast USA Regional (SER) competition pitted 76 teams from Florida, Georgia, Alabama, South Carolina, and Mississippi--we fielded four teams: Camelflage UF, Giroffles UF, Hawkward UF, and Irrelephant UF.

The four teams and their coach, Dave Small, traveled to Melbourne, FL the evening before the competition. The next morning, after a big breakfast, the teams headed to the FIT campus. Following a practice round and lunch, the teams settled in for a grueling five hour problem-solving marathon.

Each team, which consists of three students, is provided a workspace with a single computer, pens, paper and a set of ten programming challenges. In addition to allocating the problems amongst the members and effectively sharing time on their computer, to be successful, a team must also quickly size up the problem set and attack the problems in an order that will minimize solution times. While teams are ranked by how many problems they solve, ties are broken in favor of


Team Irrelephant UF (left-to-right): Mauricio Bell'Albero, Joe Thuemler, Jason Fisher

the team who spent the least amount of time developing their solutions.

Whenever a team submits a correct solution, a balloon--whose color indicates the problem solved--is brought to their work area. The sight of an opponent's growing balloon bouquet can serve to inspire a renewed sense of competition or utterly demoralize--it can also provide a clue as to which problems are more easily solved, as teams typically tackle the hardest problems last. One hour before the end of the contest, the balloons stop coming--to ensure that there is an air of suspense as to who shall be declared the victor--until the post banquet awards ceremony.

Though only the winner of the SER contest is guaranteed an invitation to World Finals (to be held mid-Spring in Sharm El Sheik, Egypt) we believe it is likely team *Irrelephant UF* will also be selected to compete and have already begun to prepare. □
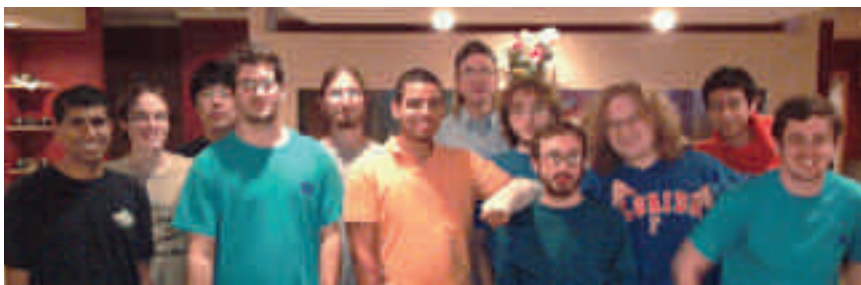
ACM/ICPC Competitors (left-to-right): Uttam Thakore, TJ Boyd, Cheran Wu, Mauricio Bell'Albero, Walter Cornnell, Willie Maddox, Dave Small, Zach Ziebarth, Jason Fisher, Joe Thuemler, Rod Salazar, Chris Dudley. (not pictured: Michael Dang)

FUTURE WEB:
CONNECTING HUMAN EXPERIENCE
TO THE WEB OF KNOWLEDGE

PROFESSOR PAUL FISHWICK:
WWW.CISE.UFL.EDU/~FISHWICK

The world wide web has changed our lives by making knowledge more easily accessible to us. You can find out about virtually anything--from Gator football scores to the history of Mahler symphonies. The connection between you and the web is usually thought of as clicking a mouse and viewing pages in a web browser. You may well think of the web in terms of how you experience web content, but what does the future hold for the web, with its reams of information, data, and knowledge? Are we to forever constrain our human connection to the web by performing the digital equivalent of flipping through pages of a book?

One possibility for the future web is to more fully explore how humans connect to the deep repositories of knowledge that define the web. To a large extent, this transformation is already occurring on devices that use the web, but rarely employ web browsers in that exploration. I refer to the latest tablet and smartphone offerings such as the iPad and iPhone. Even though smartphones and tablets do contain web

browers, the connection of the human to web servers is made more transparent with apps. Consider when you point your camera phone at a historical building, and you get back information, perhaps through a synthetic voice. In this experience, many web interactions are present but instead of experiencing them on a simulated printed page, you interact within the real world and the web knowledge is experienced in its most useful and convenient form.

The research in my group stretches from smartphone applications to virtual environments that support alternative methods of interacting with web accessible information assets. The Second China project (image at the beginning of the article) seamlessly connects elements from a flat, text and image-based collection of Chinese culture to a 3D experiential environment constructed using both the Second Life and OpenSim software frameworks. The goal behind this fairly large project was twofold: (1) to build interconnected web/virtual environment web structures for the purpose of cross-cultural educa-

tion and training, and (2) to perform a human subject experiment designed to test hypotheses about the role of immersion and interaction on presence, and the role of presence on recall and cultural sensitivity. The first phase was complete two years ago, and the processing of human subjects was just completed, with results expected soon. Do users remember more when they experience knowledge vs. watching it in video form? Is cultural sensitivity enhanced in virtual worlds compared with web page delivery? We'll know answers to these questions shortly, and these answers will be disseminated in articles and on our Second China web site (www.secondchina.com). The project in all of its phases is thoroughly interdisciplinary and has involved several colleges (Liberal Arts and Science, Pharmacy, Journalism, and Engineering).

Fig. 1 shows selected snapshots of the virtual environment where avatars log in and experience the world. The space contains 47 "bots" who are virtual humans, and who react in specific ways to deliver cultural information. For example, in the tea house, one bot greets the visitor and another introduces the visitor to famous people who have visited there.

Figure 1
A selection of snapshots from the Second China immersive environment. top left: the gazebo where all visitors start their journeys, top right: a bot in the tea house, bottom left: four bots practicing tai chi in the park, bottom right: the government square.

ARE WE TO FOREVER CONSTRAIN OUR HUMAN CONNECTION TO THE WEB BY PERFORMING THE DIGITAL EQUIVALENT OF FLIPPING THROUGH PAGES OF A BOOK?

• • •

The main areas of our research for this project are: (1) to formulate a formal state-based modeling method for virtual human interaction, (2) to explore the bi-directionality between virtual environments and flat multimedia knowledge, and (3) to study the effects of virtual environments on presence, memory, and cultural sensitivity through a human subject (N=160) experiment by controlling interaction, immersion, level of 3D environment expertise, and gender.

One of our primary lessons learned with our work involves fundamental questions about the web. Too often, we think of the web as the formula web = browser. However, the ongoing development of a semantic web reminds us that the web is really about building and interrelating knowledge. But what we are also finding, and what you may have found with your own use of tools such as LinkedIn and Facebook, is that the web is not a disembodied network. We can connect to it in different ways, from viewing the web as a printed document to exploring the world with smartphones, tablets, and game-like 3D environments. □

STUDENT TRAVEL AWARDS

LI, TAO(*): "Energy Efficient Algorithms for the RFID Estimation Problem", IEEE INFOCOM International Conference, , San Diego, CA, Mar. 15-19, 2010.
(http://www.ieee-infocom.org/2010/)

HARSH, PIYUSH: "Mode Independent Session Directory Service Architecture", and "Gray Networking - a step towards next generation computer networks", ACM SIGAPP Symposium On Applied Computing, , Crans-Montana, Switzerland, Mar. 22-26, 2010.
(http://www.acm.org/conferences/sac/sac2010/)

BOYACI, CEM: "An Investigation on the Nature of Wireless Scheduling", IEEE INFOCOM International Conference, , San Diego, CA, Mar. 15-19, 2010.
(http://www.ieee-infocom.org/2010/)

CHEN, TING: "CAVIAR: Classification via Aggregated Regression and its Application in Classifying Oasis Brain Database", IEEE International Symposium on Biomedical Imaging, , Rotterdam, Netherlands, Apr. 14-17, 2010.
(http://www.biomedicalimaging.org/)

CHEN, JIANMIN: "Weak Execution Ordering - Exploiting Iterative Methods on Many-Core GPUs", IEEE International Symposium on Performance Analysis of Systems and Software, , White Plains, NY, March 28-30, 2010.
(http://ispass.org/ispass2010/)

XIE, YUCHEN: "Image Atlas Construction via Intrinsic Averaging on the Manifold of Images", IEEE Conference on Computer Vision and Pattern Recognition , San Francisco, CA, June 13-18, 2010. (http://cvl.umiacs.umd.edu/conferences/cvpr2010/)

LIU, MEIZHU: "Total Bregman Divergence and its Applications to Shape Retrieval", IEEE Conference on Computer Vision and Pattern Recognition , San Francisco, CA, June 13-18, 2010. (http://cvl.umiacs.umd.edu/conferences/cvpr2010/)

MISHRA, TANIA: "CONSISTConsistent Internet Route Updates", and "DUOS-Dual TCAM Architecture for Routing Tables with Incremental Update", IEEE Symposium of Computers and Communication, Riccione, Italy, 22-25 June, 2010. (http://www.ieee-iscc.org/2010/)

WANG, WEIXUN: "Preemptive Dynamic Voltage Scaling for Real-time Systems using Approximation Scheme", IEEE-ACM Design Automation Conference, Anaheim, CA, June 13-18, 2010. (http://www2.dac.com/dac+2010.aspx/)

BANDYOPADHYAY, SHIBDAS: "Sorting Large Records On A Cell Broadband Engine", IEEE Symposium of Computers and Communication, Riccione, Italy, 22-25 June, 2010.
(http://www.ieee-iscc.org/2010/)

JUNG, EUN-SUNG: "Bandwidth Allocation for Iterative Data-dependent e-Science Applications, Topology Aggregation for e-Science Networks", IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing, Melbourne, Australia, May 17-20, 2010. (http://www.manjrasoft.com/ccgrid2010/)

LI, XIAO: "An Ontology-based Mapping Repository for Meta-querier Customization", International Conference on Software Engineering and Knowledge Engineering, Redwood City, CA, July 1-3, 2010. (http://www.ksi.edu/seke/seke10.html/)

NAMKOONG, YOUNG-HWAN: "Feature subset-wise mixture model-based clustering via local search algorithm", Canadian Conference on Artificial Intelligence, Ottawa, Canada, May 31st - June 2nd, 2010. (http://www.canadianai.ca/program2010/AI_2010/)

YUAN, WENJIE: "Supporting Continuous Range Queries in Indoor Space", International Conference on Mobile Data Management, Kansas City, Missouri, May 23-26, 2010.
(http://sce.umkc.edu/mdm2010/)

BANDYOPADHYAY, NIRMALYA: "Modeling Perturbations using Gene Networks", International COnference on Computational Systems Bioinformatics, Stanford, CA, August 16-18, 2010. (http://www.csb2010.org/)

KANJILAL, VIRUPAKSHA: "Plateau regions: An implementation concept for fuzzy regions in spatial databases", International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, Dortmund, Germany, June 28 - July 02, 2010. (http://www.mathematik.uni-marburg.de/~ipmu2010/)

CHEN, LU: "Enhancing Web Service Registries with Semantics and Context Information", IEEE International Conference on Service Compting, Miami, FL, July 05-10, 2010.
(http://conferences.computer.org/scc/2010/)

VISWANATHAN, GANESH: "BigCube: A Metamodel for Managing Multi-dimentional Data", ISCA International Conference on Software Engineering and Data Engineering, San Francisco, CA, June 16-18, 2010.
(http://www.users.csbsju.edu/~irahal/sede2010/)

YUKSEL, SENIHA: "Variational Mixture of Experts For Classification with Applications to Landmine Detection", "Simultaneous Feature and HMM Model Learning for Landmine Detection using Ground Penetrating Radar", IEEE International Conference on Pattern Recognition, Istanbul, Turkey, August 20-26, 2010. (http://www.icpr2010.org/)

KUMAR, MAHENDRA: "J3: High Payload Histogram Neutral JPEG Steganography", IEEE Conference on Privacy, Security and Trust, Ottawa, Ontario, Canada, August 17-19, 2010. (http://www.unb.ca/pst-net/pst2010/)

CHU, HUNG-JU: "An Information Model for Managing Domain Knowledge via Faceted Taxonomies", IEEE International Conference on Information Reuse and Integration, Las Vagas, NV, August 04-06, 2010. (http://www.sis.pitt.edu/~iri2010/)

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* Denotes College of Engineering Travel Award

STAFF SPOTLIGHT

KERI TAYLOR

Office Assistant

Keri Taylor has been with the CISE staff since August 2008 as an office assistant. She is the Department's primary payroll expert. She is responsible for hiring, time approval, payroll transactions, graduate student appointments and other human resource duties. Keri has a bachelor's and master's degree from UF and is co-publisher of the magazine, "North Florida School Days." Her outside interests include watching spectator sports (especially the Gators and Tampa Bay Buccaneers), riding motorcycles and playing with her Chocolate Labs. Before Keri came to CISE she was a Financial Aid Adviser at Santa Fe College. Her financial knowledge and background has helped her streamline the payroll process at CISE, keeping track of over 200 employees. □

NEW STAFF MEMBER

JUSTINE HIPSKY

Sr. Secretary for the Department Chair

Justine Hipsky joined the CISE staff in September 2010 as the Chair's secretary. She helps organize the Career Development Workshop, Industrial Advisory Board meetings, faculty evaluations, and has also taken over the duties of reception and maintenance of the front office. Justine graduated in December '09 with a B.A. in Political Science. And when she's not in the office, she volunteers for the Guradian ad Litem program & the non-profit organization, Bridges Across Borders. Justine enjoys cooking with friends and family, photography, going to the dog park and hiking. □

CISE CAREER DEVELOPMENT WORKSHOP

The Fall 2010 Career Development Workshop (CDW) went off without a hitch on September 20, 2010. The success of the CDW was noted by several of the company representatives on their comment cards. As one representative wrote, the CDW was a "very well run event."

Another comment could not be truer: "...good student participation, friendly volunteers." Both the ASCIE and ACM presidents shared valuable information for how to organize the actual workshop layout. The volunteers from both organizations were tremendous help during the CDW to the recruiters and the CISE staff. As one representative wrote the CISE staff and student volunteers took good care of the recruiters at the event.

We also received other encouraging comments about the quality of the students and the number of student who attended the CDW. Roughly 340 students attended.

This year 41 representatives from nine companies attended the CDW. In attendance were Amazon, American Express, Harris Corporation, Infinite Energy, Lockheed Martin, Ultimate Software, University of Central Florida's Interactive Entertainment Academy and Walt Disney Parks and Resorts. An exciting addition to the Fall 2010 CDW was Microsoft. □

ALUMNI NEWS

Are you a CISE alumnus? Have you made the news lately? Awards, start-ups, significant appointments? If you would like your news to be considered for publication in a future CISE newsletter, please email it to us at newsletter@cise.ufl.edu. Be sure to provide us with your name, your most recent degree from CISE and the year in which you received it. We would like to hear from you!

**DEPARTMENT OF COMPUTER
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ENGINEERING**

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