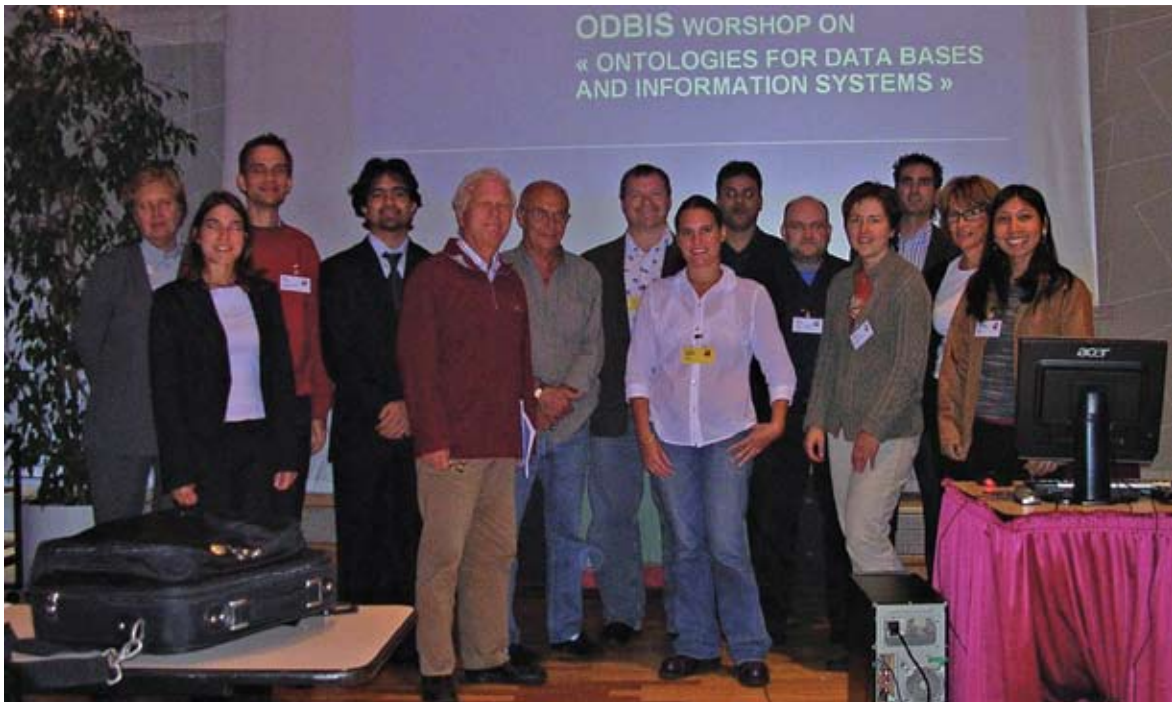
Computer & Information Science & Engineering

Spring 2006 www.cise.ufl.edu



Students Receive Grants to Present their Work at Major Conferences

CISE Ph.D. students presented papers at major conferences around the world this year. This was facilitated, in part, by the CISE Travel Grant Award, begun in 2002. Eighteen grants were awarded this year, resulting in important exposure for the University of Florida and the department.

For more information on CISE Travel Grants, please visit www.cise.ufl.edu/dept/awards/travel.html

2005/2006 Academic Year Travel Grant Recipients:

Oguzhan Topsakal: "Schema Matching with Report Analysis." 2005 International IEEE Workshop on Ontologies-based Techniques for DataBases and Information Systems (ODBIS 2005), Trondheim, Norway, September 2005. Co-located with VLDB 2005, 31st International Conference on Very Large DataBases.

John Quarles: "A Pipeline for Rapidly Incorporating Real Objects into a Mixed Environment," fourth IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR 2005), Vienna, Austria, October 2005.

Fei Wang: "Simultaneous Registration and Segmentation of Anatomical Structures from Brain MRI." 8th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Palm Springs, Calif., October 2005.

Jianhua Fan: "Root Classification of Constraint Solving." 2005 SIAM Conference on Geometric Design & Computing, Phoenix, Ariz., November 2005.

Hyunju Shim: "Programming Using Dynamic System Modeling Via a 3D-based Multimodeling Framework." IEEE and ACM Winter Simulation Conference 2005 (WSC05), Orlando, Fla., December 2005.

Heping Gao: "Combinatorial Classification of 2D Underconstrainted Systems." 7th Asian Symposium on Computer Mathematics, Seoul, Korea, December 2005.

Xu Zhang: "A New Approach for Multiple Sequence Alignment." Pacific Symposium on Biocomputing (PSB) 2006, Wailea, Maui, January 2006.

continued on page 2

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A Letter from Sartaj Sahni, CISE Chair

As the 2005-2006 academic year comes to a close, I would like to offer my congratulations to this year's CISE graduates and to applaud the efforts of the students who continue to work towards their degrees. Our student body make-up has changed over the past few years in a manner consistent with national trends. The number of undergraduate and master's degree students has decreased and the number of Ph.D. students has increased; this year we awarded 19 Ph.D. degrees compared to last year's nine. In the past five years, the number of Ph.D. students in the department has nearly tripled – from around 60 to 170.

CISE graduates at all levels continue to thrive at major universities, leading corporations, and as entrepreneurs. The alumni Web site has opened new avenues for networking between CISE graduates and current students, and provides valuable feedback for the department in support of continuous process improvement. I encourage alumni who have not yet registered on the Web site to join our expanding network.

A notable alumnus, 1985 CISE graduate John Johnson, engineering director at Harris Corp., contributed an informative article to this edition of the CISE Newsletter on UF graduates at Harris Corp. Also featured is an article on our Industrial Advisory Board, which represents an important collaboration between CISE and leading companies. The board meets twice a year in Gainesville and helps the department stay attuned to industry needs. Our success is highly dependant on our ability to constantly assess the relevance and effectiveness of our curriculum and the board plays a key role in this endeavor.

This edition of the CISE Newsletter also includes stories on our exceptional students as well as on the exciting research and teaching activities of our esteemed faculty. Newsletter coverage includes class projects that evolved into newsworthy events, such as professor Douglas Dankle's Artificial Intelligence in Computer Games' class project demonstrations, and our student organizations' outstanding accomplishments this year. Our student programming team, Association for Computing Machinery, had its best finish to date, finishing in third place at the Southeast Regional Collegiate Programming Competition. In addition, an Integrated Product and Process Design, team, coached by Manuel Bermudez, developed a distributed control system for a revolutionary new robotic system that is capable of tracking motion of a human joint via X-ray video in real time.

I would like to thank our faculty, students, staff and alums that have made this a successful and memorable academic year and to wish new CISE graduates success in their careers, as well as happy and fulfilling lives.

Students Receive Grants to Present their Work at Major Conferences

continued from page 1

Eunsam Kim: "Efficient Scheduling Schemes for HD-quality Content Distribution." IEEE Consumer Communications and Networking Conference 2006 (CCNC 2006), Las Vegas, Nev., January 2006.

Zhen Yang: "MLP Exploitation with Seamless Preload." Workshop on Memory Performance Issues (WMPI) in the 12th International Symposium on High-Performance Computer Architecture, Austin, Texas, February 2006.

Jayendra Venkateswaran*: "Finding Data Broadness Via Generalized Nearest Neighbors." International Conference on Extending Database Technology (EDBT), München, Germany, March 2006.

Subramanian Arumugam: "Closest-Point-of-Approach Join for Moving Object Histories." International Conference on Data Engineering (ICDE), IEEE Computer Society, Atlanta, Ga., April 2006.

Xudong Shi: "Coterminous Locality and Coterminous Group Data Prefetching on Chip-Multiprocessors." International Parallel & Distributed Processing Symposium 2006, IEEE Society & ACM, Rhodes Island, Greece, April 2006.

Jungmin Shin: "Distributed Process Integration: Experiences and Opportunities for Future Research." International Workshop on Web and Mobile Information Systems (WAMISÕ06), IEEE Computer Society, Vienna, Austria, April 2006.

Alejandro Pauly: "Topological Reasoning for Identifying a Complete Set of Topological Predicates between Vague Spatial Objects." 19th International FLAIRS Conference, The American Association for Artificial Intelligence, Orlando, Fla., April 2006.

Ajit Vilas Rajwade: "A New Method of Probablity Density Estimation with Application to Mutual Information Based Image Registration." IEEE Conference on Computer Vision and Pattern Recognition, IEEE Computer Society, New York, N.Y., June 2006.

Yongling Song: "Item Sets Based Graph Mining Algorithm and Application in Genetic Regulatory Networks." 2006 IEEE International Conference on Granular Computing, IEEE Computer Society, Atlanta, Ga., May 2006.

Wencheng Lu: Paper 1 - "Packet forwarding using pipelined multibit tries." Paper -2 "Packet classification using pipelined two-dimensional multibit tries."IEEE Symposium on Computers and Communications (ISCC'06), IEEE Computer Society, Sardinia, Italy, June 2006.

Practical Analysis for Large Data Sets

by Christopher Jermaine, assistant professor

It has become something of a cliché to assert that the amount of data collected in various domains such as business, science and government has been increasing exponentially. But, the fact that such assertions sound trite does not overcome the problem: many organizations have more data than they know what to do with.

One of the main problems associated with the large amount of data is figuring out how to answer questions over the data with reasonable speed. Answers to analytic queries such as "Find me the five stores with the largest net sales of Chinese-manufactured goods over the last five months," may take hours or days to compute using traditional database software. Such poor performance is one of the main reasons that archived data is often saved once and then never looked at again.

In an effort to make data more useful and more accessible, our research group is rethinking how data analysis should be performed over large amount of data. We are working to design a new prototype database system called ABC that is able to give an early guess as to the answer to a query after only a few seconds of computation. This contrasts with current database software, which treats every query as a single, monolithic operation. As time goes on, ABC's guess becomes more and more accurate until the exact answer is computed. A user of ABC is able to abort a query whenever he or she is satisfied with the accuracy of the guess, or perhaps when he or she has determined that the query was uninteresting. Unlike current software, ABC allows people to get to know their data by making it practical to issue exploratory queries without being concerned that the exploration will lock-up millions of dollars worth of software and hardware for extended periods.

Taming Bioinformatics Data

By Tamer Kahveci, assistant professor

The industrialization of molecular biology research and the improvements in computational methods and computer technology led to the birth of the computational biology and bioinformatics fields. The field of bioinformatics deals with the creation and maintenance of a database to store biological information. The analysis and interpretation of various types of data, including nucleotide and amino acid sequences, protein domains and protein structures, is referred to as computational biology. These technologies have led to better understanding of the enormous amount of biological data, and the ability to test existing theories and develop new ones based upon that data.

Extracting useful knowledge from bioinformatics data poses several challenges.

- The datasets are usually very large, making naive search strategies computationally too costly.
- The data usually has a very complicated structure leading to exponential time complexities for analysis even when the datasets are small.
- Biological information is usually inaccurate.

As a result, simple analysis techniques may produce false alarms or suffer false drops. Our research addresses these issues for a broad range of bioinformatics and computational biology problems such as sequence analysis, structure search and drug design.

Analysis of biological sequences is often needed to better understand the inner workings of organisms. In a project with Settles from horticulture sciences department, We are is exploring computational methods to identify gene knockouts for maize genome. The maize genome is not entirely sequenced yet and therefore its gene content is not entirely known. Statistics show that the maize genome contains a significant amount of repeats, mostly movable subsequences called transposons. If a transposon is inserted in a gene that serves some function, that gene stops working causing a potential phenotype change. Short fragments next to transposons can be identified using a technology called PCR amplification. These fragments may be amplified due to another transposon as there are many possible copies. The challenge then is to identify the true positives (a true positive being a gene that causes phenotype change) among a set of such fragments. This involves identification of new repeats as well as locating already known repeats in fragments. This is a challenging task as each fragment corresponds to a small piece of a large puzzle from certain biased regions.

PCR amplification is also used to find the letters of unknown long target genomes. The idea is to amplify many short fragments such that every two consecutive fragments have sufficient overlap so that they can be merged to create a longer sequence with sufficient statistical significance. These overlapping fragments are then combined to create the unknown long genome. The challenge here is to decide where to cut the large sequence given that its letters are unknown. Highly conserved regions of close homologs of the target genome give hints on potential sites. One way to find these conserved regions is to use multiple alignment. We are building multiple alignment tools to accurately and efficiently identify conserved regions and exploring data mining strategies to improve the coverage of these fragments when the genomes are subject to recombination.

Connecting the Dots

By Alper Ungor, associate professor

Imagine a bunch of dots scattered in a space. In many scientific applications we quite literally face the seemingly simple challenge of connecting the dots. The set of dots, or points, could be an abstraction for a collection of sensors in a wireless network, the center of atoms in a molecular structure or a set of scanning samples for a graphic. When connected, these points form a powerful modeling tool called a graph. Among the myriad ways of connecting points, certain methods are particularly suitable for specific applications. We often formulate the desired way of connecting the dots as an optimization problem with certain constraints. One such formulation is the well-known minimum spanning tree, where the desired graph is a tree which connects all vertices with edges whose total length is minimized.

Alternative formulations require more edges to be included in the graph. Such formulations are particularly useful in fault-tolerant network design or when the graph is used as a domain decomposition tool. For instance, maximal planar straight line graphs, or triangulations, connect the dots using as many straight edges as possible so no more edges can be included without intersecting the existing ones. An optimal triangulation problem asks for a maximal planar straight line graph which maximizes, or minimizes, a function defined on the graph e.g., maximize the total edge length or minimize the largest angle between any two edges.

For many applications adding a few new dots can provide a superior method of connecting the existing dots. The major challenge in these types of problems is to design an efficient algorithm for computing the desired optimal graph by introducing the smallest number of new points.

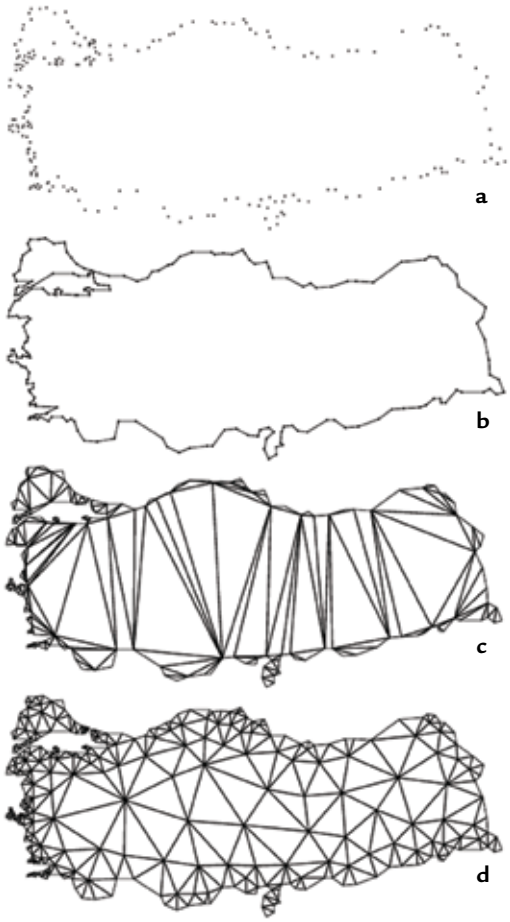
While there has been significant progress in methods of connecting the dots over the last few decades, a large set of problems in this area remain unsolved. Good solutions presently are mainly limited to two-dimensional problems and many three-dimensional geometric graph problems continue to puzzle both theoreticians and practitioners.

A straight-forward extension of the techniques that work in two-dimensional domains results in sub-optimal solutions in three dimensions. This creates a great challenge for algorithm designers as most real life applications, such as computationa biology, computer graphics and physical simulations pose three-dimensional problems. Presently, more efficient algorithms are replacing current sub-optim heuristic solutions for two-dimensional problems and a similar progression for thre dimensional problems is also beginning to take place.

Recently, I worked on the design of a new algorithm* to connect the dots in two dimensions so that the output is an optima triangulation. This algorithm has been wel received in the theory community as it has proven to be the fastest possible algorithm. Experiments show that implementation of this algorithm produces software that is significantly faster than previously availabl software. This new implementation is already in use by thousands of engineers resulting in more efficient simulations. Extension of these methods to three-dimensional problems is challenging but th promise for real life applications is great.

Another challenge in current algorithm design research is connecting points that are moving or are in the space-time domain. My recent research shed some light on this front but there remain unsolved problems in connecting points in three or more dimensions. It is only by improving our understanding of the fundamental problems in this domain that we will be able to provide efficient solutions in more real life applications. I expect the next few years to be very exciting for the researchers in the geometric algorithms field.

*** published in the proceedings of the ACM Symposium on Computational Geometry, 2005**



Map of Turkey: (a) The dots (b) Connected dots represent the boundary of the domain; (c) An Optimal Triangulation (d) Adding extra points gives a triangulation with better angles.

Aesthetic Computing Students Present *The Content is in the Machine*

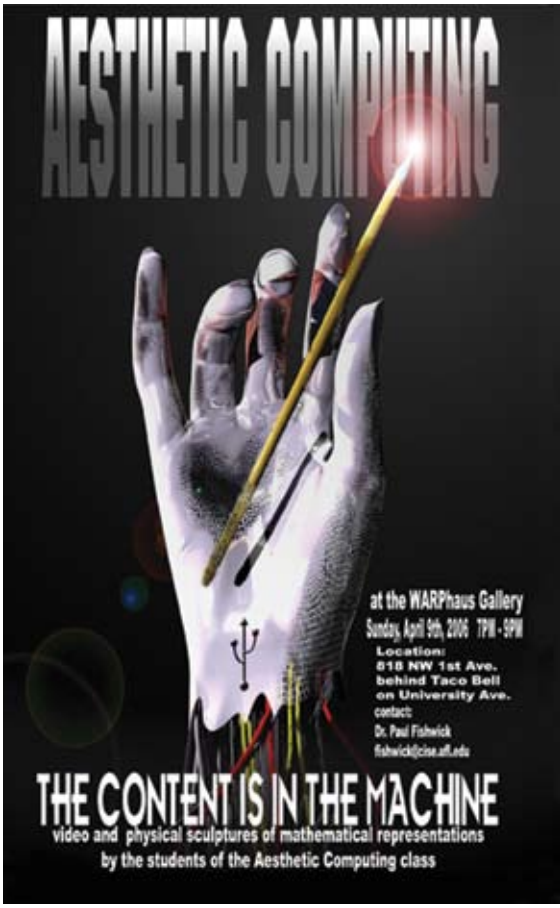
Students in Paul Fishwick's aesthetic computing class got an opportunity to display their class projects at the WARPhaus, a local Gainesville art gallery. Aesthetic computing is the use of artistic design to create models of complex concepts and visual representations that make complex concepts less abstract. For over 10 years Fishwick taught and conducted research on aesthetic computing. He notes that "One of our main goals is to provide clarity to other areas, such as mathematics. My hope is that tangible representations such as those being presented by my students will reduce the 'math anxiety' that so many students often face."

The Content is in the Machine exhibition at WARPhaus attempted to demonstrate that concept, using drawings, sculptures and computer graphics projects created by the class.

The students were part of the exhibition and explained the concepts to the audience. Some of the target representations were presented as interactive Flash animations and the audience was encouraged to participate. Wind, sail size and water current could be adjusted to show the effects on an animated sailboat. Asked to set a value for "sheep per square mile," participants could watch an animated suctioning machine vacuum up sheep and use Hollings Disk Equation to calculate the number of prey ingested.

The Content is in the Machine was displayed at the Reitz Union in March and the WARPhaus exhibition gave the class additional opportunities to demonstrate its designs for the public and interested teachers.

For more information, and to see the Flash Animations, please visit www.cise.ufl.edu/class/cap4403sp06/



Interactive Games a Hit at CISE

Students in Douglas Dankel's Artificial Intelligence in Computer Games course got an opportunity to show off their hard work in an open house to profile games they developed for the course. More than 20 students enrolled in the first course at UF. Instead of programming by the numbers, the students had to get creative and come up with their own interactive video game.

While learning various techniques on the use of artificial intelligence to make games more real, the students' initial eight project ideas were ranked by the class. The five top rated ideas were continued to production, with four to five students working on each.

The concepts for the games primarily came from movies, television and past games, incorporated with adventure themes. The games are all text-based interactive, with the decisions made by the player determining the direction and outcome of the play. One could assume the role of peacemaker or rebel in the post-apocalyptic world of Dystopia, where the player must choose to ally with one of three political factions. In all of the games, the player interacts with characters to gain information and solve puzzles to advance through stages of the game. Players at the open house who tried their hand at Thief were unable to get past the first obstacle, escaping from jail, proving that the games on display were not just simplified examples of text-interactive games.

The teams used two different toolkits to program their games, Inform and Adrift. Both allow you to code your game in a language that is specifically designed for the task of creating games. The software compiles the data and takes care of the mundane details of parsing user input and providing some default responses for user input, leaving the students more time to concentrate on the back stories and game progression.

The very successful open house attracted students, faculty and staff, as well as several reporters. Students presented their games, along with visual displays and packaging, and answered questions regarding game play, programming and inspiration while guests sat down and actually played. The games proved to be quite popular and they received more than one request for copies of the software by visitors at the open house.

Association for Computing Machinery

The Association for Computing Machinery, ACM, has had a very successful 21st year at the University of Florida. Highlights for the year included the industry speaker series, UF's best showing to date at the Regional Programming Competition, and the enormously successful UF ACM High School Programming Competition. The ACM officers for 2005-2006 are Patrick Wheeler, President; Scott Slomback, Vice President; Timothy Smith, Treasurer and Mathew Andrews, Secretary.

The ACM attracted a distinguished group of industry speakers with the theme 'How UF can help you get your dream job'. Speakers from EA Tiburon, UCF's FIEA, Microsoft, Intel, Harris and Lockheed Martin presented at ACM meetings. Their presentations included discussions with students on how to optimally shape their undergraduate or graduate experience to land the types of jobs offered at their companies. Presenters suggested students get involved in organizations, like ACM, courses to take and seeking out critical experiences e.g., team and outside of class projects. Student response to these presentations indicated that students enjoyed knowing "yes, people really do use this stuff." Professors noted that students appeared more driven in classes as potential for being hired by a top company was directly related to comprehending and mastering course material. ACM plans to continue to expand the industry speaker series next year with additional lectures from researchers and IT firms.

In October 2005, UF sent four programming teams to the Southeast Regional Collegiate Programming Competition. The UF teams were sponsored by Harris Corp. Thanks to a year long program of preparation, including a programming course in the spring taught by Dave Small, UF finished in third place, our best showing ever, and just missed out on advancing to international competition. Two other UF teams finished eighth and 11th, netting the second best aggregate performance to date for UF. Not only was UF's one of the top teams overall, all of our teams were excellent. In preparation for next year, students participated in a year long programming course. Furthermore, five hour competitions were held each month with prizes such as iPods, memory sticks and web cams given to winning individuals and teams. ACM teams from other institutions traveled to UF this year to hold a mock head-to-head competition to better prepare for next year where our veteran no. 1 team will be looking to challenge for the top spot.

In March 2006, UF hosted its annual High School Programming Competition with teams traveling from across Florida

to compete in a shortened version of the college programming competition. With prizes and support generously provided by Lockheed Martin and Harris Corp., teams of high school students attempted to solve programming problems. The competition was held in the Reitz Union and treated to tours of UF, Ben Hill Griffin Stadium and a presentation by a guest speaker from Lockheed Martin. Prizes were given out to the best performing team and all participating student programmers received UF souvenirs. The high school programming competition has developed widespread distinction and popularity thanks in large part to the role the UF ACM programming teams play in organizing and conducting the event. The competition provides a great chance to get the state's best high school programmers to the UF campus to show them the opportunities that being a Gator provides.

For more information, visit ACM's website at www.acm.cise.ufl.edu

Sky is not the Limit for CISE Students

You are the Flight commander of STS-115 on the launch pad at T minus 12 seconds to the International Space Station. Your helmet is on and you are securely strapped in. The crew of the Space Station has been isolated due to toxic and corrosive fuels and has only 12 hours to live unless you retrieve them, deliver oxygen and re-pressurize the Space Station. Or so you believe.

This innovative virtual experience was created by students of Benjamin Lok's "Design and Creation of Virtual Environments" class, Karen Cano and Omer Shahid, both MS candidates in computer science, and Salam Daher, a second year MS student in digital arts & sciences.

The group picked this virtual environment in an attempt to give users an experience that would otherwise not occur in everyday life. The challenging physical setup, for which the three had no experience, took the students a combined total of 1,000 hours in six weeks to complete. The space simulator combines a motion platform, an interactive control panel and joystick, bass shakers, and 3D animated video. The realism of the ride is accomplished by using an interesting assortment of everyday items. Thrust, G-force and aerodynamics simulating the shuttle's launch and ascent are accomplished by a rocker, sliding rails, a platform and some thick rubber bands. A rubber balloon tightens a five-point racing harness strapped to the user to simulate gravity. Bass vibrations shake the platform, the seat and the control board, and, of course, the simulator's pilot. The interactive controls are powered by a hidden keyboard, springs and the insides of ball point pens.

continued on page 9

Association of Digital Art and Media

The Association of Digital Art and Media or ADAM had an invigorating 2006 spring semester including numerous events that brought digital artists and engineers together. The semester began as Digital Worlds sponsored a $1,000 Web site competition for the redesign of the ADAM site, seen at www.ufdas.org. Josh Greenberg and Andres Barreto won this competition and have implemented a new Web site for the ADAM organization.

ADAM meetings have included screenings of distinguished animated shorts, as well as various tutorials in which members learn the essentials of 3-D modeling and animation. James Oliverio, the 2006 ADAM faculty adviser, presented his philosophy concerning the direction and potential of ADAM, as well as exposure to many of the productions in the digital culture. James Pence also taught a tutorial in which ADAM members learned the basics of modeling with Blender.

ADAM also, hosted "Getting Under the Hood" where Chris Ontic and Patrick Pagano featured a digital-music-and-video-creation workshop. The event taught many ADAM members to construct digital music and video productions. This event also showcased the system Pagano and Ontic created to integrate music and video.

ADAM also hosted an event in which Paul Fishwick presented some of the research and teachings in his related classes, as well as the philosophy of the Digital Arts and Sciences, DAS, program. ADAM members were able to generate feedback concerning the DAS curriculum and recommend changes they would like.

The final ADAM meeting for the semester provided a forum where students gave advice on finding employment, as well as numerous tips students can do to enhance their portfolio and presentation to potential employers. This meeting also showcased several DAS senior projects and ADAM members were exposed to the style and caliber of the projects created in the Digital Arts and Sciences program.

The semester was filled with valuable events and activities for students interested in the digital culture. Check the new ADAM Web site (www.ufdas.org) to connect with ADAM members, and hear about events in the fall semester. If you are a student interested in digital art, music, video, 3-D modeling, 3-D animating, visual programming or development, please check out the ADAM Web site

Bobby Bruckart
2005-2006 ADAM President

Kevin Austin undergraduate advisor

Most of our students will recognize Kevin Austin, one of CISE's two undergraduate advisors. Austin is responsible for advising half of the 800 students in five different majors in computer science. Austin's responsibilities include being the Grade-A-Gator coordinator, assisting the athletic department with recruitment of athletes with interest in computer science, graduation and honors certification, independent study registration and catalog updates.

Born in Horsham, Pennsylvania, Austin moved to the Orlando area with his family at age eight. He received his AA from Seminole Community College in Sanford, Florida in 1986. He recieved a BA in history from University of Florida in 1989, and an AS degree in legal studies from Santa Fe Community College in 1995. Most recently, Austin received his Master of Education (M.Ed.) in educational leadership from University of Florida in 2005.

Austin has been with UF since 1995, working in both the registrar and admissions offices. He has worked as a CISE undergraduate advisor since Fall 2000.

His outside interests include history, politics and classic rock music, especially the Beatles. And, while he's a fan of all Gator sports, Austin also remains allegiant to his hometown Philadelphia teams, the Flyers, Phillies, Eagles and 76ers.

We hope he will remain a part of CISE's student services center for years to come.

Faculty News

Arunava Banerjee, assistant professor, awarded $100,000 grant titled "Modeling DNA damage Induced Cell Death Responses--Streamlining Basic Research information for Clinical Applications" by UF Genetics Institute

Randy Chow, professor, appointed to Committee of Visitors for the Computer and Network Systems Division (CNS) in the Directorate for Computer and Information Science & Engineering (CISE) at the National Science Foundation (NSF), March 2006,

- gave a keynote address on "Modeling and Simulation of Context-Awareness" at the 39th Annual Simulation Symposium in Huntsville, Alabama, April 2006

Timothy Davis, associate professor, will give a keynote address on "Direct Methods for Sparse Linear Systems" at the SIAM Conference on Financial Mathematics and Engineering in Boston, July 2006

- appointed associate editor of the journal *Computational Optimization and Applications*

Paul Fishwick, professor, appointed Distinguished Lecturer by Society for Modeling and Simulation International (SCS)

Paul Gader, professor and **Joseph Wilson**, assistant professor, awarded $80,000 grant titled "Software Algorithm Improvements for Hand Held Landmine Detection" by the U.S. Army

Joachim Hammer, associate professor, appointed Editor-In-Chief of ACM SIGMOD's Digital Symposium Collection (DiSC)

- awarded $30,000 grant titled "A New Approach to Semantic Heterogeneity" by Microsoft Corporation

Tamer Kahveci, assistant professor, awarded Ralph E. Powe Junior Faculty Enhancement Award from Oak Ridge Associated Universities (ORAU)

- awarded $17,000 grant titled "Sequence Indexed Maize Transposon Insertion sites for Cereal Functional Genomics" by UF Division of Sponsored Research

Richard Newman, assistant professor, awarded $37,000 grant titled "Practical Anonymous Communication Phase 11-A," by ITT Industries, Inc.

Stephen Thebaut, assistant professor, awarded 2005-2006 Outstanding UF EDGE Faculty Award from UF College of Engineering

CISE and its IAB: Academia and Industry Converge

The Industrial Advisory Board, a partnership between CISE and industry, began in 1998 and provides a crucial link to the innovation-driven industry of computer science and engineering. The board members provide support to CISE through monetary, equipment and software donations, and also provide critical input on current industry trends. This input helps to focus our curriculum, facilitates departmental accreditation and better enables our graduates to meet industry expectations. Board members also benefit through interactions with peers, cooperative research and contacts with students who may be future interns or permanent employees.

This year's spring meeting, held March 9th, included representatives from Harris Corp., Lockheed-Martin, IBM, Raytheon, Exxon Mobil, Bayshore Solutions, Solidworks and the University of Central Florida. Pramod Khargonekar, dean of the college of engineering, addressed attendees, describing their critical participation in the ongoing ABET accreditation process. He noted the positive funding outlook for the department and of efforts to foster alumni connections via alumni surveys and the availability of free UF e-mail accounts through the UF Alumni Association.

Both Khargonekar and Sartaj Sahni, chair of CISE, agreed that the quality of students is improving. Sahni noted that CISE's student body is changing in a manner consistent with national trends, with fewer undergraduate and master's students but with nearly a tripling of Ph.D. students in the past five years. Nineteen Ph.D.'s were awarded in 2005 compared with nine in 2004. Director of the Electronic Delivery of Graduate Engineering program Mary Bonhomme, stated that EDGE students are omitted from these numbers. The program, with roots going back to the early 1980s FEEDS program, offers 30-40 courses per semester in several non-thesis MS programs.

A prominent focus at the meeting was the ongoing ABET accreditation process, presented by Richard Newman and Manuel Bermudez. The increased rigor of ABET accreditation now focuses on graduates' skills more than curriculum content. Board members unanimously passed a formulation of outcomes and objectives focused on ABET accreditation criteria. Gene Matter of Intel Communications Group, John Morgan of Lockheed Martin and IAB Chair Jack Needham of Harris Corp., volunteered their expertise to serve on a Computer Engineering Industrial Advisory Board in a collaborative effort between CISE and electrical & computer engineering to aid in the accreditation process.

The meeting also featured a presentation by Anand Rangarajan on GroupWise multimodality image restoration, focusing on high dimensional histogramming solutions, a demonstration of a shuttle flight simulator by students of Benjamin Lok, and a 3-D medical procedure illustrator by students of Jorg Peters.

More information on the IAB can be found at its website: www.cise.ufl.edu/iab

Gators at Harris

John Johnson
Engineering Director, Civil Programs Business Unit, Harris Corp.
Melbourne, FL
John.Johnson@harris.com

Harris was founded in 1895 and today is an international communications and information technology company. Headquartered in Melbourne, Florida, Harris has more than 13,000 employees – including 5,500 engineers and scientists. With our proximity to Gainesville, the gator community at Harris is substantial.

The University of Florida has been the number one university recruiting source for Harris for the past five years. We currently have 468 employees who graduated from UF working in all types of positions throughout the company. In the past five years, we have hired 138 UF new grads, 67 who came from the Department of Computer & Information Science & Engineering.

Harris is strongly focused on supporting initiatives that are key to developing the minds and character of future Harris employees and leaders. In a major show of support for UF's College of Engineering, Harris pledged $1,025,000 to the college in July 2005. The gift will be used for the new engineering building's atrium and lecture hall. A previous donation was used to build a new lab in the CISE building. Harris also supports UF annually through STEP -UP, MIL lab, ACM team and Subjugator.

The focus of Harris is to provide assured communications and information technology to government and commercial customers, wherever and whenever they need it, with the highest levels of performance and reliability. Harris devotes significant resources to the continued development of leading communications technologies. During fiscal year 2005, research, development and engineering expenditures for the corporation totaled $870 million, fueling new product development and strengthening Harris' technical capabilities. This investment includes significant funding from the U.S. government as well as company-sponsored R&D. Harris also has a rich portfolio of intellectual property that includes more than 900 U.S. and foreign patents.

I work for the Harris Government Communications Systems Division, which is the largest of the corporation's four divisions, and is the company's hub for research and development. My business area develops both hardware and software systems for the civil agencies of the U.S. government. Specific agencies include the Federal Aviation Administration, Bureau of Census, National Oceanographic and Atmospheric Administration, and the National Aeronautics and Space Administration. The hardware products we are developing include systems for increasing the map accuracy for the Department of Census to providing weather and communications systems for the FAA National Airspace System. Software technologies for these systems include image processing, voice and data compression, distributed relational database, enterprise applications and service oriented architectures.

The evolution of computer sciences in the last 20 years has been phenomenal. As an alumnus of UF, I am proud to see CISE at the forefront of the evolution. As a member of industry, I am delighted to have such a fine institution located in our home state that continually provides the talent base required to solve problems for our customers that were intractable just a few decades past. Go Gators!

About the Author
John Johnson graduated from the University of Florida with a BS in Computer and Informational Sciences in 1985. Following two years of summer interning, John was hired full time at Harris in May of '85. Since joining Harris, John has had increasing responsibility in Software Development and Engineering Management. His interest ranges from real time embedded systems through large distributed information network systems.

Sky is not the Limit for CISE Students

continued from page 6

Four rear projected images on three screens, speakers under the floor and surround sound technology help to make the journey more realistic. The flight commander must dock the shuttle at the space station using a working joystick, while cabin movement is tracked by a Web-cam.

Using actual photos, the students created three-dimensional realistic models of the cabin, shuttle, space station and solar system in 3D Studio Max, exported them into Open Flight format and then into Vega Prime, which allows placing multiple observers at different angles and keeps all displays synchronized.

Originally launched in December for Lok's class, the simulator's journey did not end there. The students' have demonstrated their work for Digital Worlds Institute, the Engineering Fair, the Industrial Advisory Board, faculty candidates, and various CISE classes. The students have plans to continue improvements on the virtual experience, including using more interactive controls during the flight to increase user involvement and absence of gravity simulation. They also plan to study how each of the components contributes to the overall virtual experience.

For more information on the Spacemission project, please visit http://web.dcp.ufl.edu/kcano/spacemission.

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