BASU AND PROFESSOR MISHRA RECEIVE BEST PAPER AWARD AT THE INTERNATIONAL CONFERENCE ON VLSI DESIGN

CISE Ph.D. student Kanad Basu and his advisor Professor Prabhat Mishra received the Best Paper Award for their research paper entitled, “Efficient Trace Signal Selection for Post-Silicon Validation and Debug” at the International Conference on VLSI Design, 2011. The conference was held at IIT Madras, Chennai, India from January 2-7, 2011.

Post-silicon validation is an essential part of modern integrated circuit design to capture bugs and design errors that escape the pre-silicon validation phase. A major problem governing post-silicon debug is the observability of internal signals since the chip has already been manufactured. Storage requirements limit the number of signals that can be traced; therefore, a major challenge is how to reconstruct the majority of the remaining signals based on traced values. To address these challenges, this paper describes a novel trace signal selection technique for post-silicon validation and debug.

Existing approaches focus on selecting signals with an emphasis on partial restorability, which does not guarantee good signal restoration. This paper proposes an approach that efficiently selects a set of signals based on total restorability criteria. The experimental results demonstrate that signal selection algorithm is computationally more efficient and can restore up to three times more signals compared to existing methods.

CHEN, XIU, LI AND PROFESSOR HELAL RECEIVE THE IEEE/IPSJ SAINT 2010 BEST PAPER AWARD

CISE professor Sumi Helal and Ph.D. students Chao Chen, Yi Xu, Kun Li received the Best Paper Award for their research article entitled “Reactive Programming Optimizations in Pervasive Computing” at the 10th Annual International Symposium on Applications and the Internet. This symposium was jointly sponsored by the IEEE Computer Society and the Information Processing Society of Japan (IPSJ).

The paper describes E-SODA a reactive (rule-based) programming model intended for pervasive computing systems along with the Atlas Reactivity Engine (ARE) that implements the E-SODA model. Without careful optimizations, reactive programming could turn into a monstrous power drain of the pervasive system and its limited-energy sensor network. Two optimizations targeting energy efficiency and sentence efficiency were introduced and evaluated, based on the adaptive “push/pull envelope” concept.

The Atlas Reactivity Engine aims at providing a restrained service-oriented environment for “safely” programming pervasive spaces. It is based on the Atlas sensor platform architecture and middleware developed by Dr. Helal and his students, and commercialized by Pervasa, Inc, a University of Florida start-up founded in 2006.
CISE PROFESSOR PAUL GADER NAMED FELLOW OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE).

Professor Paul Gader was elevated to the grade of Fellow of the IEEE for contributions to computational intelligence algorithms for landmine and explosive object detection. Professor Gader has been active in land mine detection algorithm research since 1996. In the late 1990s, he led a team that devised and demonstrated a real-time algorithm for mine detection for the GEO-CENTERS Vehicle Mounted Mine Detection System. He served as Technical Director of the Multi-University Research Initiative on Humanitarian Demining for two years. He has worked with acoustic-seismic, ground penetrating radar, wideband electro-magnetic induction, LiDAR, and multi- and hyper-spectral image sensor data. He led teams that devised and demonstrated Hidden Markov Model, fuzzy prototype matching, and spectral analysis algorithms for mine detection in Ground Penetrating Radar that have formed the basis for software in an operational detection vehicle. He also led teams that devised and demonstrated algorithms for hand-held mine detection systems that are currently in use by the U. S. Army.

Professor Gader is and has been involved in many other applications of signal and image analysis, including handwriting recognition, parallel processing, magnetic resonance spectroscopy, intelligent highways, automated blood cell counting, human geography, and is beginning to investigate automated mapping and analysis of coral reefs.
Paul Gader and Joseph Wilson, together with colleagues from the Universities of Missouri and Louisville, Duke University, and Georgia Tech, have been conducting research on algorithms for detecting explosive objects for over ten years. Their basic research on algorithms forms the basis for the software used in an operational system: the Husky Mounted Detection System (HMDS) developed by NIITEK for the U. S. Army (http://niitek.com/index.php).

The HMDS system, shown in the figure, uses a set of unique ultra-wideband Ground Penetrating Radar antennas mounted in front of a vehicle, to produce three-dimensional volumes of data. The standard metal detector can reliably detect objects that contain significant amounts of metal, but not many of the modern explosive objects contain significant amounts of metal.

In contrast, radar can, in principle, detect many types of buried non-metallic materials. The radar waves are reflected back to the antennas from every point in the ground at which a change in electrical properties exists. This means that the radar will produce reflections from plastic or other non-metallic objects under the ground that may be indicative of explosive objects. It also means that the radar will produce reflections from buried rocks, moisture pockets, and inhomogeneous soils. Therefore, sophisticated processing is required to discriminate explosive objects from non-explosive objects. This is where professors Gader and Wilson and their colleagues played a critical role.

For over ten years, they have worked to devise numerous algorithmic concepts. A few years ago, a large-scale evaluation of over fifteen different algorithmic approaches was conducted using evaluation software developed by CISE, resulting in three “winning” algorithms. The winning algorithms used combinations of statistics, fuzzy sets, neural networks, and Fourier analysis to calculate likelihoods that explosive objects are present.

The director of the Joint IED (Improvised Explosive Device) Defeat Office, Lieutenant General Thomas F. Metz, was quoted as saying that “The ground-penetrating radar in Afghanistan is a perfect example of [success] ... With all of the rural terrain, the route clearance units have to cover a large area, and the enemy has just too many opportunities to put out the IEDs. Ground-penetrating radar seems to have met the needs of the soldiers in the fight, and they are talking about it being a real game changer.”.

The study of algorithms is crucial to the performance of autonomous systems. The basic algorithmic research focused on robust, efficient, and reliable methods for processing highly complex sensor data has applications to many other areas beyond explosive object detection. Professors Gader and Wilson have, or are currently, engaged in similar basic algorithm research for web mining, handwriting recognition, medical image analysis, Magnetic Resonance Spectroscopy for rebuilding damaged brains, explosives (as opposed to explosive object) detection using hyperspectral imaging, fish identification for understanding the status and movements of fish to support fishing, and several other applications. Many of these applications use the same basic research concepts and require robustness, efficiency, and reliability. CISE researchers will continue to conduct this basic research in the hope that they can continue to provide the basis for important and useful applications.
STUDENT OPPORTUNITY

WHAT: Senior Certificate Program in Computer Science and Engineering: a single semester, 12-credit certificate program offered through the CISE Department.

WHO: It is intended for Computer Science and Computer Engineering seniors who are enrolled in universities other than the University of Florida. The requirements include:

1. Must be a senior enrolled in a recognized undergraduate degree program in Computer Science and/or Engineering.
2. Must have a GPA equivalent to a B or better.
3. Must have demonstrated English communication skills.
4. Students from non-exempt countries must demonstrate proficiency in English by providing TOEFL and/or TSE scores.

WHEN: Completed applications must be received by September 30th for admission to the Spring program.

HOW: The courses that make up the certificate are to be selected from the 4xxx and 5xxx courses offered by CISE in the semester in which the student is enrolled. The student must complete 12 credit hours of approved CISE courses with a grade of C or better in each course.

WHY: Students who obtain a “B” or better on each of the courses taken in the Senior Certificate Program, and who apply and are admitted to the Master’s Computer Engineering program offered by CISE will be able to transfer any of their 3xxx-level certificate courses into the Master’s program.

THE SENIOR CERTIFICATE PROGRAM began in the Spring of 2009. Seven of the 11 students who participated in that first Program applied and were accepted into the M.S. program for Fall 2009. In the following year, eight of the 12 Certificate students from the Spring of 2010 applied and were accepted for Fall 2010. This spring nine new students are participating in the Senior Certificate Program, as it makes for a smooth transition between undergraduate and graduate coursework at the University of Florida.
CONGRATULATIONS
2009-2010 GRADUATES

DOCTOR OF PHILOSOPHY IN COMPUTER ENGINEERING

LU CHEN / Dissertation Title: A Web Service Composition Framework Based on Integrated Service Substitution and Adaptation / Adviser: R. Chow

TERESA NIETEN / Dissertation Title: A Simulation-Based Approach to Decision Support for Robot-Human Team Configuration / Adviser: P. Fishwick

XIAO LI / Dissertation Title: Mapping Reuse for Meta-Querier Customization / R. Chow

VENKATAKRISHNAN RAMASWAMY / Dissertation Title: The Transformational Complexity of Acyclic Networks of Neurons / A. Banerjee

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Ruchi Agarwal
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Alex Whitler
Robert Willis
Howard Wolfson

*Cum Laude
**Magna Cum Laude
***Suma Cum Laude
**STAFF SPOTLIGHT**

**RACHEL NGAI**

Rachel Ngai has served the CISE faculty and staff as a senior fiscal assistant since May of 2007. In her role, she handles the bulk of purchasing for the Department. She reconciles the Department’s expense cards, ‘p-cards,’ and all the related invoices, purchase orders, and other paperwork. She processes the travel documents generated by graduate students and faculty within the Department. Rachel has a bachelor’s degree from UF in Computer Graphic Design. On her off time, Rachel loves to cook. She also enjoys playing computer games, especially World of Warcraft.

**KERI TAYLOR**

Keri Taylor was promoted from Office Assistant to Office Manager in the beginning of 2011. She is heading up the administrative leadership of the Departmental office staff, and her new position retains her old payroll duties while adding a broad spectrum of responsibilities.

**TINA STAGLIANO**

Tina Stagliano is the new graduate admissions officer for CISE. She processes all incoming applications for the graduate program. Tina is from Gainesville, and before working at UF she spent a year teaching English in Thailand.

Taeber Rapczak joined the CISE staff in November as the new Web Administrator. He maintains the Department website, databases, and many web-based programs. Since starting, he has primarily focused on developing an electronic, faculty-review system of graduate applicants. A Gainesville native and lifelong Gator, he has a B.S. in Computer Engineering from UF. He enjoys travel, running, good music, and is passionate about sustainable living.

Jen Jackson joined the staff over the New Year, and assists Student Services. She also works with the faculty to project and budget their federally granted research funds. Jen graduated from UF with a degree in Business, and loves to be outside. She enjoys entertaining friends, cooking, and reading.

Please join us in welcoming our new and promoted staff members!

**STAFF PROMOTIONS**

**NEW STAFF**

**CISE CAREER DEVELOPMENT WORKSHOP**

The Spring 2011 Career Development Workshop (CDW), held at the beautiful Touchdown Terrace on January 24, 2011, was another great success! About 500 Computer and Information Science and Engineering students showed up dressed to impress, with resumes in hand. They were enthusiastically greeted by 50 representatives from 11 different companies. This semester’s event brought the return of Amazon, American Express, Bloomberg, Harris Corporation, Infinite Energy, Innovative Scheduling, Lockheed Martin, Microsoft, Ultimate Software, University of Central Florida’s Interactive Entertaining Academy, and Walt Disney World.

It goes without saying that the CDW would have been near-impossible without the incredible help of our student volunteers. Several ASCIE and ACM student members not only helped with the initial planning and organization of the evening, but also reported at 2:00 in the afternoon to begin hauling all of the necessary equipment over to the Touchdown Terrace. They helped organize the workshop layout, handled the student check-in at the front door, helped to keep the lines flowing smoothly, and ensured that the company representatives were well taken care of during the event. These efforts did not go unnoticed, as several of the company representatives deemed the event “high quality” on their comment cards.

Company representatives were particularly impressed by both the quantity and quality of the students in attendance. Some of the companies were so eager to make sure that every student had their chance at an interview that they even continued to hold interviews in another location after the CDW ended. Overall, the Spring 2011 Career Development Workshop was a huge success for companies and students alike, and sights are now set on Fall 2011.
The Gator Nation at GE is growing strong with approximately 500 UF alumni, several of whom are graduates of the CISE Department!

GE’s entry-level leadership programs offer recent college graduates top development opportunities that combine real-world experience with formal classroom study. Every year, GE hires over 1,000 students globally into these renowned leadership programs. Through a series of rotating assignments — typically over a period of two years — new professionals receive accelerated professional development, world-class mentors, and global networking that cuts across all GE’s businesses. A leadership development program like this is as important to your personal brand as the college degree you are working to achieve.

For CISE majors, the Information Management Leadership Program (IMLP) puts IT careers on the fast track by combining GE’s renowned reputation for leadership development with the challenge of rotational job assignments. IMLP develops leaders with strong technical and project management skills who serve as the pipeline for IT leadership roles across GE.

The big picture? GE is a global infrastructure, finance, and media company taking on the world’s toughest challenges. We are taking the strengths that make us an industry leader and putting them to work in the service of a new era of global business.

Global leaders don’t just happen. That’s why GE invests $1 billion annually in its people and entry-level leadership development programs. GE has world-renowned training facilities around the globe, including the John F. Welch Leadership Center (Crotonville, NY) which was recently cited by BusinessWeek. Take into consideration their tuition reimbursement benefits, and you can see GE takes its investment in you seriously. And it’s not just GE’s investment in you that makes it the best choice for your future. GE is investing more in technology than at any time in its 135-year history. It is also rebuilding manufacturing capability and selling its products in every corner of the world.

It’s simple: the choices you make today will set the course for the rest of your career. Let GE make things even simpler: we will provide you with the best leadership development programs in the world, and career growth opportunities limited only by your ambition and imagination. Why settle for anything less than a career with one of the most admired companies in the world? Now is the time to decide where you will invest your future. Allow GE to invest in you!

As “GE-Gators,” our recruiting team believes in the quality of the CISE programs and we take pride in bringing back the best and brightest to launch their careers!

Visit us at ge.com/imlp for more information.
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 the future CISE newsletters, 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!

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