COMPUTER & INFORMATION SCIENCE & ENGINEERING

CISE NEWS

spring 2011 www.cise.ufl.edu

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. □

KANAD BASU AND HIS ADVISOR PROFESSOR PRABHAT MISHRA RECEIVED THE BEST PAPER AWARD FOR THEIR RESEARCH PAPER TITLED "EFFICIENT TRACE SIGNAL SELECTION FOR POST SILICON VALIDATION AND DEBUG"

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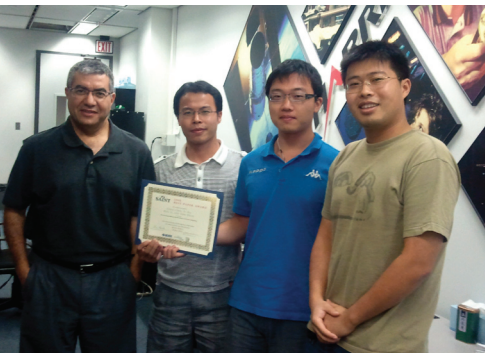
CHEN, XU, LI AND PROFESSOR HELAL RECEIVE THE IEEE/ IPSJ SAINT 2010 BEST PAPER AWARD



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 sentience 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. □

FACULTY NEWS

PAUL GADER / *Professor* / Was elevated to the grade of an an IEEE fellow.

AHMED HELMY / *Associate Professor* / Served as the co-chair of the IEEE/ACM IWCMC (International Wireless Communications and Mobile Computing Conference) held in Caen, France in July 2010. He was also the vice-chair of the technical program committee of the IEEE MASS (International Conference on Mobile Ad-hoc and Sensor Systems) held in San Francisco, CA, in November 2010. Dr. Helmy is also slated to co-Chair the IEEE SECON (Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks) to be held in Salt Lake City, UT in June 2011, the ACM MobiCom CHANTS (Workshop on Challenged Networks) to be held in Las Vegas, NV, in September 2011, the ICST/ACM AdhocNets (Int'l Conference on Ad Hoc Networks) to be held in Paris, France in September 2011. He will serve as the General Chair of the ACM MSWiM (Int'l Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems) to be held in Miami, FL in October 2011.

BENJAMIN LOK / *Associate Professor* / Received a $43,547 grant from the Department of Veterans Affairs for his project, "Development of Virtual Humans for PTSD and MTBI"

PRABHAT MISHRA / *Associate Professor* / Received the Best Paper Award (co-authored with his Ph.D. student, Kanad Basu) at the International Conference on VLSI Design held at IIT Madras, Chennai, India on January 2–7, 2011. Dr. Mishra served as Guest Editor in IEEE Design and Test of Computers in the year 2010-2011. He was elevated to Senior Member of ACM.

MY THAI / *Assistant Professor* / Founded and chaired the Program Committee of IEEE Globecom workshop on Complex Communication Network held in Miami, FL in December 2010. She also served as Program Committee co-chair of International Conference on the Dynamics of Information System, 2011. Dr. Thai is also serving as a Series Editor of Springer Briefs in Optimization.

GERHARD RITTER / *Professor Emeritus* / was a Plenary Speaker at the 2010 Hybrid Artificial Intelligent Systems (HAIS) conference held in San Sebastian, Spain. Dr. Ritter has been invited to be the Colloquium speaker at the Research and Advanced Studies Center (CINVESTAV) in Guadalajara, Mexico, and the National Institute of Astrophysics, Optics, and Electronics (INAOE) in Puebla, Mexico. Both conferences will be in May 2011.

JOSEPH WILSON / *Assistant Professor* / Received a $15,000 grant from Disney for his project, "Interactive Restaurant Tabletop."

Professor Gader engaging in blind testing of algorithms for landmine detection 10 years ago.

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. □

The Husky-Mounted Detection System developed by NIITEK, Inc. incorporates basic research concepts developed by CISE professors and their colleagues from the Universities of Missouri and Louisville, as well as Duke University.

CISE PROFESSORS GADER AND WILSON RESEARCH ON ALGORITHMS FOR DETECTING BURIED EXPLOSIVE OBJECTS HELPING TO SAVE LIVES.

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 inhomogeneus 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 TRAVEL AWARDS 2009 – 2010

AWARDED IN THE FALL SEMESTER 2010

MOON, SUNGWOOK(*): "Understanding periodicity and regularity of nodal encounters in mobile networks: A spectral analysis", IEEE GLOBECOM International Conference, Miami, FL, Dec. 06-10, 2010.

THAKUR, GAUTAM: "Similarity Analysis and Modeling in Mobile Societies: The missing link", and "ROTECT: Proximity-based Trust Advisor using Encounters for Mobile Societies", ACM CHANTS Workshop co-located with Mobicom Conference, Chicago, IL, Sep. 19-24,2010.

ROSSEN, BRENT: "Using Virtual Humans to Bootstrap the Creation of Other Virtual Humans", ACM/AAAI Internatonal conference on Intelligent Virtual Agents, Philadelphia, PA, Sep. 20-22, 2010.

LI, TAO: "Identifying the Missing Tags in a Large RFID System", ACM International Symposium on Mobile Ad Hoc Networking and Computing, Chicago, IL, Sep. 20-24,2010.

BANDYYOPADHYAY, SHIBDAS: "GPU Radix Sort For Multifield Records", ACM-IEEE International Conference on High Performance Computing, Goa, India, Dec. 19-22, 2010.

HALAN, SHIVASHANKAR: "High Scores! - Motivation Strategies for User Participation in Virtual Human Development", ACM/AAAI International conference on Intelligent Virtual Agents, Philadelphia, PA, Sep. 19-22, 2010.

CHUCHAISRI, PANOAT: "Fast Response PKC-Based Broadcast Authentication in Wireless Sensor Networks" IEEE-ICST CollaborateCom International Conference, Chicago, IL, Oct 09-12, 2010.

CHO, CHUNGLAE: "Multi-tree Multicast with a Backpressue Algorithm", IEEE Conference on Decision and Control, Atlanta, GA, December 15-17, 2010.

XUAN, YING: "A Graph-theoretic QoS-aware Vulunerability Assessment for Network Topologies", IEEE GLOBECOM International Conference, Miami, FL, Dec. 06-10, 2010.

CHENG, JIALONG "Better Upper Bounds on the Rank of the 3D Rigidity Matroid of a General Graph", NSF 20th Annual Fall Workshop on Computational Geometry, Stony Brook, NY, Oct. 29-30, 2010.

MOGHADDAM, SAEED: "Internet Usage Modeling of Large Wireless Networks Using Self-Organizing Maps", Second Workshop on Scenarios for Network Evaluation Studies in conjunction with IEEE International Conference on Mobile Ad-hoc and Sensor Systems, San Francisco, CA, Nov. 08-12, 2010.

ZHANG, MING: "A Probabilistic Approach for Improving TCP Fairness across Multiple Contending WLANs", IEEE GLOBECOM International Conference, Miami, FL, Dec. 06-10, 2010.

AWARDED IN THE SPRING SEMESTER 2011

BASU, KANAD(*): "Efficient Trace Data Compression using Statically Selected Dictionary", IEEE VLSI Test Symposium, Dana Point, CA, May 1-5, 2011.

QIN, XIAOKE: "Efficient Directed Test Generation for Validation of Multicore Architecture", IEEE International Symposium on Quality Electronics Design, Santa Clara, CA, March 14-16, 2011.

NGUYEN, NAM: "Adaptive Algorithms for Detecting Community Structure in Dynamic Social Structure", IEEE INFOCOM International Conference, Shanghai, PRC, April 10-15, 2011.

BANDYOPADHYAY, NIRMALYA: "Identifying Differentially Regulated Genes", IEEE International Conference on Computational Advances in Bio and Medical Sciences, Orlando, FL, Feb. 03-05, 2011.

QIAO, YAN: "On Memory Access Bloom Filters and Their Generalization", IEEE INFOCOM International Conference, Shanghai, PRC, April 10-15, 2011.

LUO, WEN: "Efficient Missing Tag Detection in RFID Systems", IEEE INFOCOM International Conference, Shanghai, PRC, April 10-15, 2011.

LIU, MEIZHU: "RBOOST: Riemannian Distance based Regularized Boosting", IEEE International Symposium on Biomedical Imaging, Chicago, IL, Mar. 30 - Apr. 02, 2011.

OZKAN, AYSEGUL: "EASAL: Efficient Atlasing, Analysis and Search of Molecular Assembly Landscapes, ISCA International Conference on Bioinformatics and Computational Biology, New Orleans, LA, Mar. 23-25, 2011.

** Denotes College of Engineering Travel Award*

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 5xxx-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 to and were accepted to 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**

MASTER OF SCIENCE IN COMPUTER ENGINEERING

Amrita Adusumilli
Ruchi Agarwal
Somshekhar Akolkar
Prabhat Aravind
Shashan Balashankar
Tanya Bansal
Rituraj Bhuyan
Manish S. Bodhankar
Cem Boyaci
Akshay Reddy Chada
Ting Chen
Manikandan Chidambaram
Suhitha Reddy Chigarapalli
Asmita Chitale
Ashutosh Chitwadgi
In Chul Choi
William G. Clark
Aniruddha Das
Srinwantu Dey
Vikrant W. Gajre
Bhavik Gandhi
Xiaoyang Gao
Vaibhav Garg
Ujwala Jadhav
Prateek Jagtiani
Rejith George Joseph
Prathamesh Joshi
Vineetha Kalvakunta
Srikanth Kannan
Kartheek Karra
Girish Satish Khadke
Venkat S. Khanderao
Zheng Li
Meizhu Liu
Min Luo
Satish Malireddi
Akhilesh K. Mallik
Charmie R. Maniar
Ankit Marwaha
Madhavi Mattegunta
Kavita A. Mehrotra
Soumya Mishra
Jason Monsorno
Srishti Mukherjee
Sreekar Nagubadi
Aritra Kumar Nath
Jonathan Ohlrich
Mounika R. Paduru
Rahul Pendyala
Rajiv V. Pillai
Ketan Puranik
Arun Purushan
Patrick M. Quinlivan
Aayush Raj
Nithya Ramanathan
Ashutosh Ranjan
Emmart S. Rauch
Girish Ravunnikutty
Vibhav H. Salgaonkar
Jaikaran Sandhu
Malavika Saxena
Mary M. Sharac
Anmol Sharma
Gaurav Sharma
Sagar S. Shetty
Bin Shi
Sushan Shringarpure
Siddharth Singla
Sriram Sridhar
Durga Subramanian
Divya Sundararajan
Tavleen Singh Suri
Anirban Thakur
Nithin Thazheveettil
Ramesh Tippabhotla
Ashish Tiwari
Ashish Tripathi
Krishnan Tripunithara
Prashanth Venkatarman
Ajit K. Verma
Amit Verma
Prasanna Vijayanathan
Anuragini Viswanathan
Evan Wall
Feixuan Wang
John Robert Wernsing
Sirui Xu
Ying Xuan
Suchitra Yellapantula
Tianyuan Zhang

MASTER OF SCIENCE IN COMPUTER SCIENCE

Prathima Bandla
Hongke Qin
Zihan Qin
Prateek Singh
Daniel Soffer

MASTER OF SCIENCE IN DIGITAL ARTS & SCIENCES

Marcus A. Bothsa
Chia-Yuan Chang
Chi Chen
Ti-Wei Lin

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Alexis De Girolami*
Willie Maddox III**

*Cum Laude
**Magna Cum Laude
***Suma Cum Laude

STAFF SPOTLIGHT

Senior Fiscal Assistant

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.

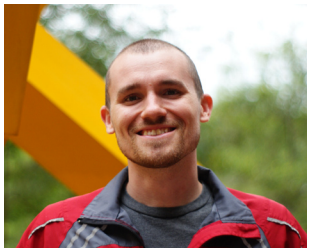
STAFF PROMOTIONS

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.

NEW STAFF

TINA STAGLIANO



TAEBER RAPCZAK

JEN JACKSON

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!

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.

GATORS @GE

The Gator Nation at GE is growing strong with approximately 500 UF alumni, several 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. □

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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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