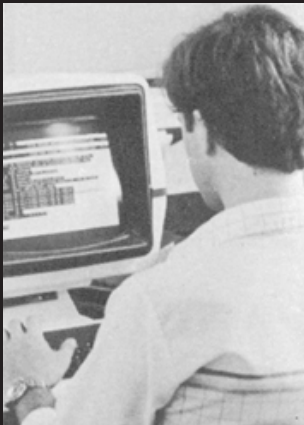


CISE NEWS

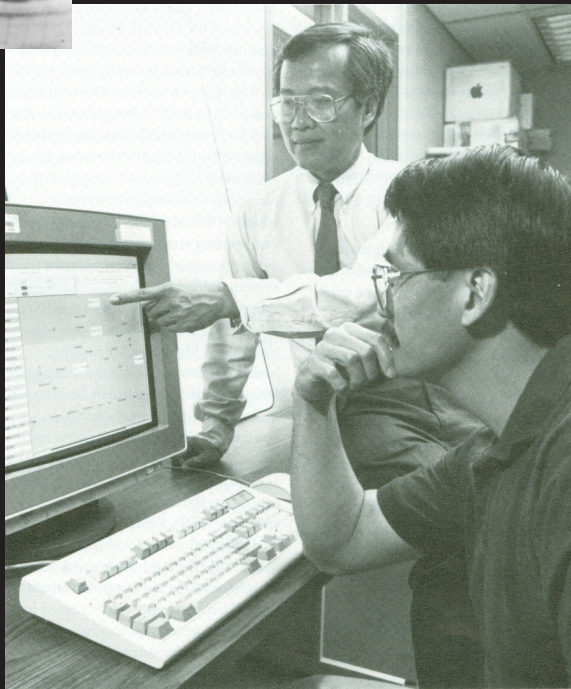
fall 2012

www.cise.ufl.edu



A student is working at a computer terminal in the early '80's.

LOOKING BACK, MOVING FORWARD



Dr. Stanley Su (CISE Department) works with Dr. Herman Lam (ECE Department) on an interdisciplinary project to develop a graphical user interface for an object-oriented knowledge base management system in 1992.

A student in Dr. Benjamin Lok's lab uses mixed reality humans to administer an eye exam in 2007.



CHAIR'S MESSAGE



As the new Interim Chair of CISE, I am very pleased to present our Fall 2012 newsletter. CISE had a difficult year, but a new year is upon us and the future is bright. We have great faculty, students and staff and look forward to actively engaging in what we love to do in 2013.

Our growth in research productivity is excellent. Research expenditures have increased at an annual rate of 8% since 2005. A total of 9 Ph.D. students graduated in the Fall semester alone!

Faculty are writing high quality scholarly articles, serving on international committees, receiving prestigious awards, receiving patents, and starting companies. We are a busy group!

Our research is wide-ranging, and includes fundamental and applied research in algorithms, many aspects of database research, computer architecture, computer vision, machine learning, computational neuroscience, artificial intelligence, intelligent sensor data analysis, parallel processing, sparse matrices, computer graphics, human-machine interaction, networks, ubiquitous and mobile computing, social network analysis, and cybersecurity. We collaborate with researchers from medicine, agriculture, engineering, the law school, and arts and sciences. Our research provides direct benefit to solving problems related to cancer, health care, defense and security, and climate change, to name a few.

Undergraduate enrollment has increased by 27% since 2007, which is good, since demand for our students is very high. Our students are extremely talented; they are some of the best students in one of the most populous states in the U. S.

Companies from all over hire almost all of our BS graduates in Computer Science, and Engineering. Students also have opportunities here in the beautiful city of Gainesville, thanks to start-ups in the Innovation Hub, as well as companies like MindTree, InfoTech, Groove Shark, Infinite Energy, etc. We expect demand for our students to increase: the U.S. Bureau of Labor Statistics projects 750,000 new jobs in Computer and Information Technologies between 2010 and 2020 including 250,000 for Software Developers alone! This is more than all other areas of engineering combined.

Continued on page 3

UF Programming Team Advances to ACM-ICPC World Finals!



Cookies 'n Cream, the dream team. From Left to Right: Programming Coach Dave Small, Joe Thuemler, Cheran Wu and Alex Anderson.

In November, our programming team sent five squads to compete in the Southeast USA Regional ACM (Association of Computing Machinery) International Collegiate Programming Contest, the most prestigious of all the collegiate competitions of this type.

UF was the second ranked school in the Southeast region, and its best squad, Cookies 'n Cream - consisting of Alex Anderson, Joe Thuemler, and Cheran Wu - along with their coach, Dave Small, have been invited to compete in the World Finals, which will be held in St. Petersburg, Russia at the beginning of July, 2013.

We are proud that UF will be fielding one of just 115 teams competing, standing along side teams from the likes of MIT, Stanford, and CMU as representatives of the United States at the ICPC World Finals. For more information on the ACM ICPC, go to:



<http://icpc.baylor.edu/ICPCWiki/attach/staticResources/Factsheet.pdf> ►

FACULTY NEWS

MANUEL BERMUDEZ / Associate Professor / received a \$16,500 award from Disney for the project "ESPN Wide World of Sports Guest Mobile App."

ALIREZA ENTEZARI / Assistant Professor / received a \$70,000 award from ONR for the project "Sparse Approximation in Multivariate Spline Spaces."

BENJAMIN LOK / Associate Professor / received an award from NSF for \$665,793 for the project "MEDIUM: Plug and Train: Mixed Reality Humans for Team Training."

PAUL GADER / Interim Chair and Professor / gave a keynote talk entitled "Hyperspectral Image Analysis: How to see inside a Pixel" at the Robotic Systems and Science conference in Sydney, Australia, July 2012. He gave an invited lecture with the same title at the University of Massachusetts, October 2012. He co-authored an invited talk entitled "Hyperspectral Endmember Detection: Accounting for Non-Linear Mixing and Spectral Variability," presented by his former student at the National Geospatial Intelligence Academic Research Symposium in Washington, D.C., August 2012. He gave an invited lecture at the Universidad de las Palmas de Gran Canaria entitled "Nonlinear Spectral Unmixing: An Overview with Applications," September 2012.

SUMI HELAL / Professor / was invited to be a 2012 Peking University Distinguished Lecture Series speaker at the School of Electrical Engineering and Computer Science, China, October 2012.

PRABHAT MISHRA / Associate Professor / received a \$450,000 grant from NSF for the project "Automated Techniques for Efficient Post-Silicon Validation and Debug of Integrated Circuits." He organized a special session on "Post-Silicon Debug" at IEEE International High Level Design Validation and Test Conference, Huntington Beach, California, November 2012. He also coauthored two books: Dynamic Reconfiguration in Real-Time Systems, and System-Level Validation, in July and August 2012.

JORG PETERS / Professor / organized a collection of minisymposia, on Geometric Modeling at the SIAM (Society of Industrial and Applied Mathematics) conference, July 2012. The minisymposia spanned iso-geometric analysis, topological techniques in geometry and the use of crystallographic patterns and constructions for efficient exploration of shape space, high-dimensional visualization and use in architecture.

GERHARD RITTER / Professor Emeritus / was invited to present as a keynote speaker at IWCIA 2012, the fifteenth of a series of international meetings on combinatorial image analysis at the University of Texas-Austin in November 2012.

BEVERLY SANDERS / Associate Professor / received a \$40,275 award from the University of Illinois for the "Blue Waters Petascale Project."

MARCUS SCHNEIDER / Associate Professor / gave a keynote talk titled "Complex Object Management in Databases: About the Preparedness of Database Technology for New Emerging Applications" at the 27th Brazilian Symposium on Databases (SBBD) 2012. At the same event, he also held a tutorial titled "Spatial and Moving Objects Databases: State of the Art and Future Research Challenges".

MARK SCHMALZ / Research Associate Scientist / received a \$30,000 award from Frontier Technology, Inc, for the project "Advanced Algorithms for Space-Based Next Generation Infrared Sensor Exploitation."

BABA VEMURI / Professor / was invited to speak as a Distinguished Lecture Series Speaker at Siemens Corporate Research, Princeton, NJ in October 2012, as a Plenary Speaker, Medical Imaging Conference, Mumbai, December 2012, and was invited to lecture at the International Biomedical and Astronomical Signal Processing (BASP) Frontiers Workshop, Villars-sur-Ollon, Switzerland, January 2013.

DAISY WANG / Assistant Professor / gave an invited talk at Rochester Big Data Forum 2012, Rochester, New York, October 2012.

We are excited about producing highly skilled, innovative computer scientists and engineers to meet demand, particularly in the State of Florida. However, with the economic downturn, support from the State of Florida diminished by 15% over the past 5 years while undergraduate enrollment has gone up 27%. Tenure track faculty numbers have decreased from 34 to 30 and lecturers from 8 to 2. We expect

undergraduate enrollments to increase by 200 beyond our existing total of 650.

Please consider supporting CISE to help maintain the level of excellence, creative energy, and student-faculty interaction that these great students and the stake-holders in the University of Florida deserve. Support for professional lecturers, programming labs and assistants, and

computing equipment are examples of meaningful, concrete resources that would be gratefully acknowledged. Please help us to ensure that every CISE student knows that "It's Great to be a Florida Gator!" ►

Thank you,



Paul D. Gader
Interim Chair

RESEARCH UPDATE

Google Street View and the Gator Nation math behind it

Tim Davis, Professor

Here's a fun project: attach a camera to a car and drive around town taking photos. Stamp each photo with its GPS location, and then create an online app that allows you to view a map of the city and zoom down to a street-level view to see what's where. Sounds cool, just like Google Street View, right? If that was all Google did, no one would bother to use the app, because the data would be noisy. You might "stand" at a street corner and expect to see a road and a building, but all you would see is the vacant lot next door.

Oops.

It's a good thing Google Street View doesn't stop there. They resolve this problem with cool math and some high-performance computational science to back it up. They create a large nonlinear least squares problem that stitches the data together so that the photos fall in the right place. You might have done something like this by hand in your high school science class – taking experimental measurements, plotting them on a graph, and then drawing a smooth line through the noisy data to create a coherent view of your experiment.

Google can't do that by hand, so they developed a software package called Ceres instead. To solve its nonlinear problem (a "sparse bundle adjustment") Ceres needs to solve a sequence of large linear systems of equations. The matrices in these systems are very sparse, or "mostly zero."

When a matrix is mostly zero, a sparse direct method can be effectively used to solve it. This is where the Gator Nation takes over. Sparse direct methods are very complex, relying on a hefty mix of linear algebra and novel combinatorial graph algorithms. The CHOLMOD solver Google relies on is the result of 20+ years of research I've done with my students and colleagues. Because of their complexity, these codes are huge. It would take a whole ream of paper to print out the code (fortunately we can create the code without ever doing so). Google uses the CHOLMOD package for two reasons: it's fast and reliable. In spite of its complexity and widespread use, I have yet to receive a bug report from any external user; I prefer to find my own bugs instead.

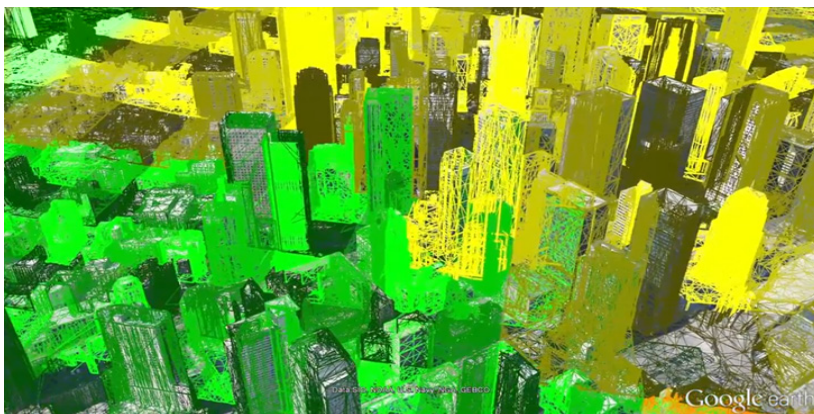
Google relies on Ceres not only for Street View, but also for Google PhotoTours and 3D Earth. Thus, every photo in Street View, across the planet, is placed in its proper place as a result of my widely-used research and code. As another example, the US Geological Survey relies on CHOLMOD for creating maps of Earth, Mars, asteroids, and other planetary bodies. They state:

"In our case the target is planetary bodies such [as] the Moon, Mars, Mercury, and other solid bodies. I know CHOLMOD made huge speed increases (many hours/days to minutes I believe) for our bundle adjustment software when we were running with a large set of images. I will extend our thanks to you for providing these great tools and know that your work is helping to make accurate cartographic maps of many solar system bodies that will be used for future rover and, hopefully soon, human explorations."

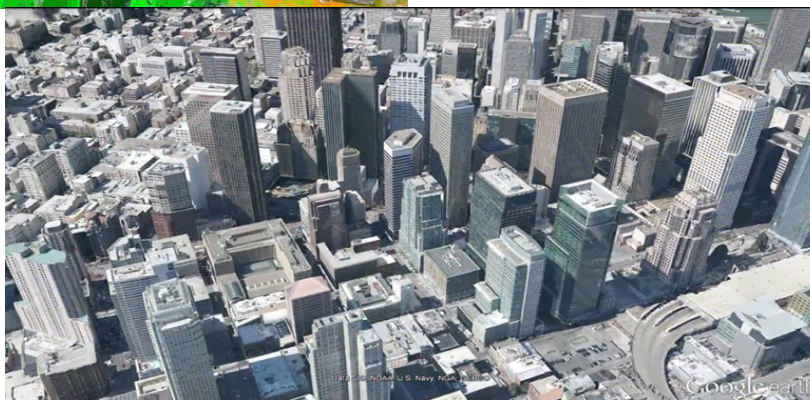
-Jeffery Anderson, USGS

So, the next time you use Google Street View for a road trip to California, or for your next trip to Mars, remember the Gator Nation - your trip wouldn't be possible without it.

To read more and to watch some cool videos of CHOLMOD at work, look it up at <http://www.cise.ufl.edu/~davis/research.html> ►



Google Earth uses CHOLMOD to create 3D models of entire cities from aerial imagery



HYPERSPECTRAL IMAGE ANALYSIS: HOW TO SEE INSIDE A PIXEL

Hyperspectral images provide a means for computers to identify materials in a scene at a sub-pixel level. They are beginning to be used to help solve problems in agriculture, climate change, defense, homeland security, planetary exploration, and medicine. Researchers in CISE are devising new computer algorithms for processing hyperspectral images that can serve as the basis for more widely applicable and accurate analyses of these data.

Suppose you are interested in the health of a large forest. You want to measure the percentages of area covered by live oak leaves, green grass, and pavement. You would have to distinguish between mixtures of the colors, shown in Figure 1.

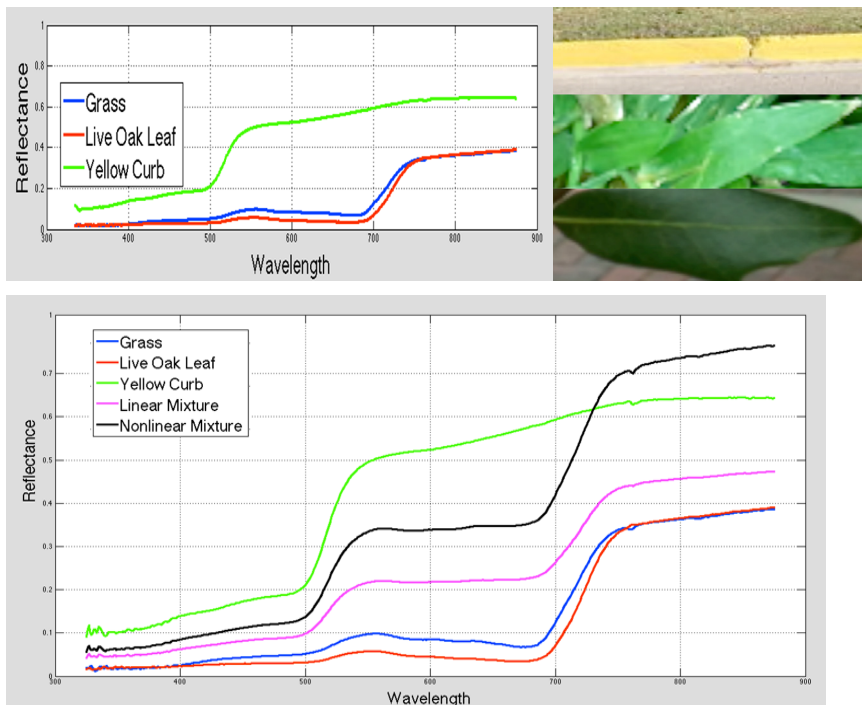


Figure 1

You could send workers out to collect data, but it would be very expensive, highly variable, and difficult to repeat on a regular basis. You would prefer to use measurements collected by cameras in airplanes or satellites that fly over the forest on a regular basis, but this poses a few problems. You want to circumvent the issues of time and expense associated with people processing the imagery by using a computer to calculate the required percentages. Thus, one needs to devise and code an algorithm that performs the calculation. Another difficulty that can arise is that the differences in colors between leaves can be very subtle. Typical cameras measure light in the Red, Green, and Blue (RGB) regions of the electro-magnetic spectrum only.

Many researchers and practitioners are seeking solutions using imaging spectroscopy, which extends such analyses to a variety of non-laboratory settings. The data measured by an imaging spectrometer are called hyperspectral images. Simply put, a hyperspectral image is an

Paul Gader, Interim Chair
and Professor

image produced by measuring light in tens or hundreds of colors at each pixel (as opposed to the three colors in a standard RGB camera). The pattern formed by each collection of colors is called a spectrum, and the spectra present in a hyperspectral image provide information about what materials exist in the field of view of the imaging spectrometer.

Imaging spectrometers produce spectra by measuring light over very small bands of the electro-magnetic spec-

trum. To measure sufficient light to form an image, pixels that have larger spatial extent are required. This implies a lack of spatial resolution (fewer pixels) for a given area. It also implies that light reflected from multiple materials is likely to be mixed into the measured spectrum at each pixel. For example, airborne imaging spectrometers typically have pixels that correspond to one square meter on the ground. Spaceborne imaging spectrometers typically have pixels that are hundreds or thousands of square meters. If we want to know the percentage of different plants inside a pixel, then we need to see inside a pixel.

How do we do that? We have to solve a class of problems referred to as inverse problems. The measured light from the different materials have been mixed together by some process or processes. Our problem is to devise algorithms that can identify the mixing processes and then undo, or invert, the mixing to identify the components of a mixture. Algorithms for hyperspectral image analysis are under investigation by CISE researchers.

We will host an international workshop on hyperspectral image and signal processing here at the University of Florida in June, 2013 (<http://www.ieee-whispers.com>) ►



Imaging spectrometers usually measure light outside of the range of visible light. This enables differentiation between objects that look the same in the visible range, as seen on the right. Using Near-Infrared, green plants look white and green landmines look black.



POST-SILICON VALIDATION AND DEBUG

Prabhat Mishra, Associate Professor 

When it comes to designing real-life systems, complexity is a major bottleneck. Commercial software projects can have millions to billions of lines of complex code. Similarly, many hardware designs use billions of transistors and their complex interactions. Design complexity is increasing rapidly over the years to implement increasingly complex functionality on System-on-Chip (SoC) platforms while meeting time-to-market, power, performance and other application-specific constraints. The drastic increase in design complexity has also led to a significant increase in validation and verification complexity. There has been a plethora of research efforts in both industry and academia to develop scalable design validation approaches using a combination of simulation based techniques and formal methods. In spite of

extensive efforts, it is not always possible to detect all the functional errors and electrical faults during pre-silicon validation. Post-silicon validation is used to detect these “escaped design flaws” (errors).

Figure 1 shows the overview of three important validation and testing phases in a typical SoC design methodology. Pre-silicon validation effort includes validation of various functional as well as timing requirements in both specification and implementation. Manufacturing testing is primarily used to detect physical (structural) defects in each of the manufactured integrated circuits (ICs). On the other hand, the focus of post-silicon validation is to detect design flaws that have escaped pre-silicon validation. In reality, the vast majority of functional errors are captured in the pre-silicon

stage. While a small percentage of functional errors remain, the time required to find and fix them is still very expensive. Note that the majority of the electrical faults (including cross-talk, delay and transient faults) are captured during post-silicon validation.

Post-silicon validation is widely acknowledged as a major bottleneck for complex integrated circuits. Recent studies indicate that the post-silicon validation effort consumes more than 50% of overall SoC design effort (cost). Someone who has debugged complex software programs would be aware of the difficulty associated with finding the cause of an error by observing many (hundreds or thousands of) variables over thousands/millions of clock cycles.

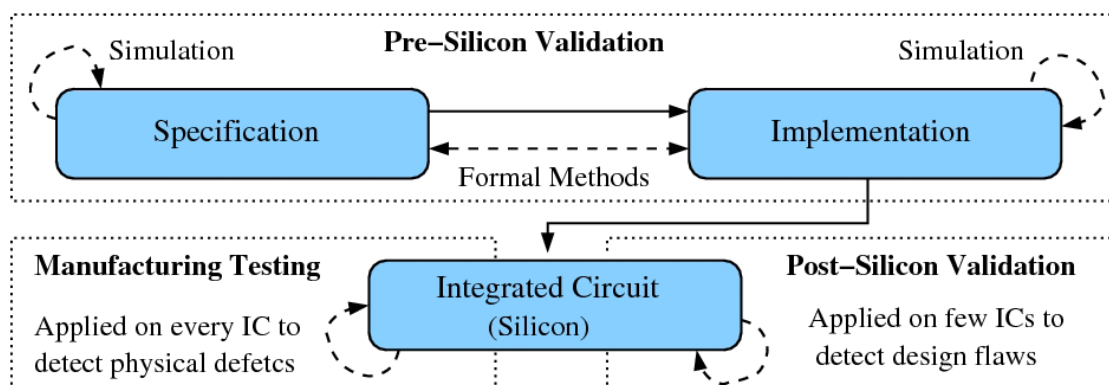


Figure 1: Important validation and test phases in SoC design framework

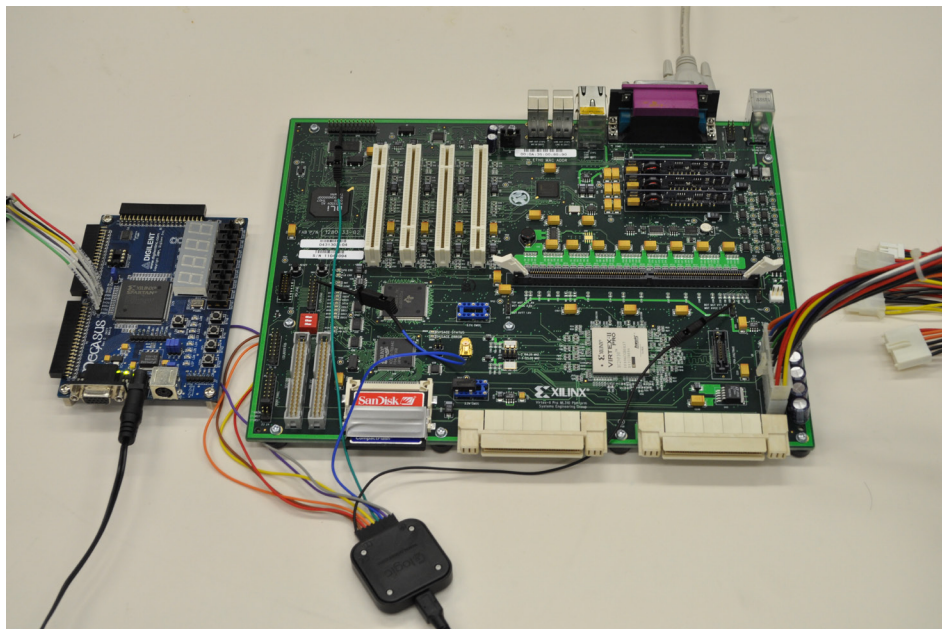


Figure 2:
Post-Silicon
Validation
and Debug
Framework

The debugging problem is worse in case of post-silicon validation due to observability constraints since the IC has been manufactured (fabricated) as shown in Figure 2.

Certain hardware structures (such as trace buffers) allow storing values of a small set of internal signals. As expected, observing only 32-64 internal signals makes debugging immensely time consuming/frustrating when the design has millions to billions of signals. To make matters worse, a typical trace buffer can hold values for a limited number of cycles (1024 - 4096) whereas an error can occur after millions of cycles. Limited observability necessitates repeated execution to localize and fix an error. This is like keeping my eyes closed 99.99% of the time and trying to find my car key that was lost somewhere in Gainesville; unless some innovative and magical approaches are used, I will be looking for my car key for the rest of my life.

The researchers in our embedded systems group are developing efficient tools and techniques to improve the overall post-silicon validation effort by efficiently utilizing pre-silicon knowledge during post-silicon validation. As shown in Figure 3, we are pursuing four research directions:

1. Selecting profitable signals to maximize detection and localization of errors,
2. Ensuring efficient use of available debug infrastructure,
3. Developing observability-aware test generation methods, and
4. High-level debug for analyzing post-silicon failures to drastically reduce the debug complexity.

The proposed directions are synergistically inter-dependent. For example, signal selection needs to effectively utilize the available debug infrastructure. Similarly, test generation needs to be aware of both selected signals and available debug hardware. Likewise, the success of high-level debug depends on the quality of the traced signal values.

This project is supported by National Science Foundation and Intel Corporation. The work has already generated significant interest from both academia and industry. Our work on trace signal selection has received the Best Paper Award in the International Conference on VLSI Design, 2011. Researchers from Intel, IBM, Freescale and AMD are involved in this project which has led to joint tutorials and publications in international conferences and journals. A successful implementation of this research will have a significant impact in industry as well as in academic research to explore innovative ways of combining pre-silicon and post-silicon approaches for efficient validation of complex and heterogeneous integrated circuits. →

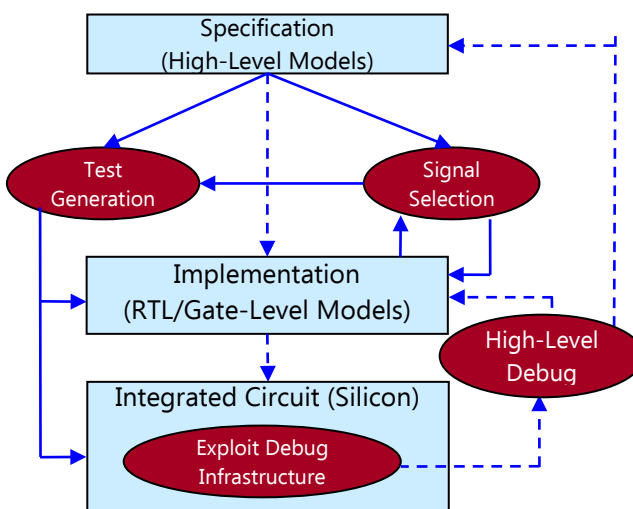


Figure 3:
Four research
directions

A brief historical account of faculty in the CIS(E) Department

Randy Chow, Professor Emeritus

A picture of the northeastern corner of the football stadium, painted with the slogan, "This is Gator Country," and a proud proclamation, "We are an inter-college department with degree programs in the Colleges of Engineering, Liberal Arts and Sciences, and Business Administration", were the first two slides in the slide presentation used by Roger Elliot and I on many occasions when introducing our department in the 1980s.

I joined the CIS faculty in 1981. The department was young and

out that there were some parallels between the development of our academic program and the Gator football program over the last three decades.

My first decade, the 1980s, in the context of computer science, could be characterized as a period of transition from the mainframe systems to the personal computer era. Student enrollment was exploding. There were never enough PCs in our computer labs and the labs were always overcrowded. However, the department enjoyed

ing, and at the same time, we would continuously strengthen the core systems area in programming language, algorithm, operating system and architecture. The infrastructure was in place for the Database Research Center (DBRC) and the Software Engineering Research Center (SERC). The new faculty joining the database area included Don Batory, Mike Manino, Nabil Kamel, Alex Papachristidis, and Sharma Chakravathy. The software engineering area added



Circa 1983: Drs. Oliver and Geiser (seated) refine a machine, the Quantic 1200, that takes echocardiogram results and quantifies them, numerically.

Students chat in a state of the art computer lab in the early '80's.



growing. It consisted of only 10 regular members (Roger Elliot, Ray Selfridge, Stanley Su, Frank Vickers, Sham Navathe, Doug Dankel, Les Oliver, Joe Brown Smith, Suhas Kundu, and Randy Chow) and 2 joint members (Julius Tou and Herman Lam) from the EE department. The department was located on the top (5th) floor of Weil Hall with a couple of people (including me) housed on the 3rd floor of the stadium. (The stadium did not have the north- and south-end extensions yet, not to mention the Skybox.) So it seemed inevitable that my academic life at UF would be affected by the Gators' football program from the very beginning. In fact, it turned

a pretty good jumpstart for both undergraduate and graduate programs. It was a truly inter-college department with strong support from the Deans in the colleges of Engineering, Business, and Liberal Arts and Sciences, and the Provost. There was never a budget issue. We were always given as many new lines from the College of Engineering (Wayne Chen, Dean) as we could fill.

There was far more demand than supply for computer science faculty, so the recruiting was very competitive. Our recruiting strategy was concentrated on two areas, database systems and software engineer-

Suhas Kundu, Steve Thebaut, Maurice Schrader-Frechette, and Panos Livadas. The core system area, chronologically, added Fred Taylor, Joe Wilson, Manuel Bermudez, Ravi Varadarajan, George Logothetis, Paul Fishwick, Richard Newman, and Yann-Hang Lee. In addition, Gerhard Ritter and Baba Vemuri joined the department and started up a third focus area in Computer Vision and Graphics (CVG). Incidentally, Alan Merten, Dean of the College of Business Administration, was also a mem-



Dr. Dankel takes a moment to explain something to a student in the early '80's.

ber of our department. Although the Dean of CBA, he chose CIS as his home department and was tenured through us.

Overall, it was a productive decade. The number of faculty in the department more than doubled. We graduated our first MS student in 1982 and the first batch of three PhDs in 1987. The department was lucky to have a very proactive Industrial Advisory Board led by VPs from IBM and Harris. The IAB was very instrumental in fighting for needed resources for us from the upper administration. Meanwhile, we went through two Board of Regent program reviews, which were a requirement once every five years. The external reviewers were quite intrigued and impressed with our "inter-college" structure and degree programs. Interestingly enough, in both reviews with different reviewers, they all recommended that a separate "college of computing" could be a better approach in providing an interdisciplinary computer science education. The recommendation was never taken seriously by the administration, perhaps due to lack of vision or urgency. Nevertheless, our spirit and upward momentum were as high as that of our football program. Like the Gators' football team, we were pleased with our progress every year and were always looking forward to bettering ourselves the following year. Finally, at the end of the decade, we got our wish to move from Weil Hall to the brand new CSE building in 1989. We had to share the new building with CIRCA, and due to the tremendous growth of the department, the space was filled up immediately. Resources were limited, but life was good for CIS.

The second decade, the 1990s, was a period marked by the transformation from the widespread use of PC systems to Internet computing and communication. The department, under the leadership of Steve Yau and Gerhard Ritter, continued its momentum from the '80s. We had a new dean, Win Phillips. The most significant development in this decade was that we aligned ourselves closer to the College of Engineering than the other two colleges. While the EE department changed their name to ECE, we had our name changed from CIS to CISE. There was an increased collaboration and curriculum sharing with ECE. With a faculty recruiting strategy similar to that of the '80s, the DBRC added Eric Hansen and Yoachim Hammer, the SERC was joined by Steve Yau, David Stotts, and Justin Graver. The CVG added Andrew Lane, Hong Qin, and Jorg Peters. A strong group of researchers in algorithm was developed, which included Tim Davis, Sartaj Sahni, Sanjay Ranka, Rajasekaran Sanguthevar, and Meera Sitharam. The systems area continued its growth with the addition of Ted Johnson, Jih-Kwon Peir, Beverly Sanders, Sumi Helal, Michael Frank, and Jonathan Liu. The scope of the systems were also expanded to include distributed systems, multimedia, and pervasive computing. Li-Min Fu, a MD and PhD, brought another dimension to the program. It marked the beginning of our research interaction with the medical school. Collaboration with health sciences is now a major research component for faculty in CVG. All in all, the department has emerged to become a full-fledged, comprehensive computer science department. Like the Gators' football team,

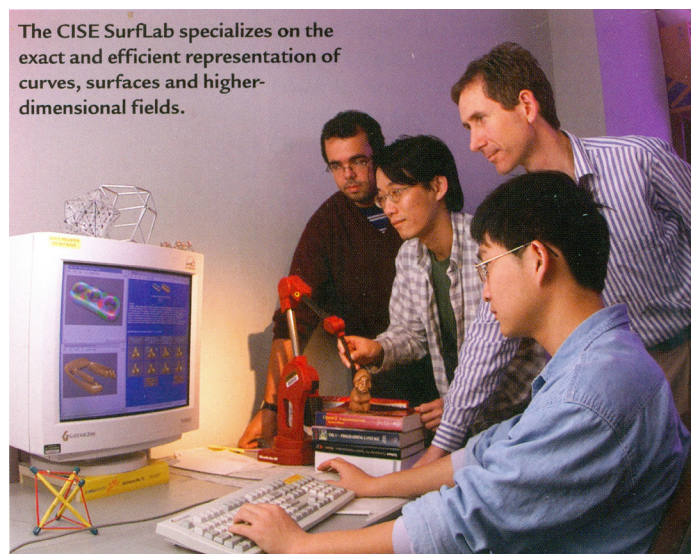
we were finally ranked with other peer state universities nationally, except that our Gators' football achieved a national championship in 1996! Still, life was not just good, it was better for CISE.

The third decade, the 2000s, was a period of complete makeover of the Internet into the WWW. The Web touched every aspect of our life and the scope of computer science was several orders of magnitude larger than what we could have imagined in the '80s. Sartaj Sahni chaired and led the department almost the entire '00s with the support of a new Dean, Promod Khar-gonekar. Faculty recruiting continued with Jose Fortes, Paul Gader, Su-Shing Chen and Anand

Dr. Yau speaks with his students about developing software for parallel processing systems.



The CISE SurfLab specializes on the exact and efficient representation of curves, surfaces and higher-dimensional fields.





A graduate student tests a wireless navigation system designed to help the blind navigate around obstructions, late in the '90's.

Rangarajan joining the department, and Sanjay Ranka returning early in the decade. There were two disastrous economic downturns in this period, the dot-com bubble burst in 2001 and the housing bubble burst in 2008. However, the former created a golden opportunity for us in terms of faculty recruiting. We were able to recruit a slew of young talent in the early part of the decade. The database area was expanded to include Chris Jermain, Markus Schneider, Alin Dobra, and Tamer Kahveci. The vision and computer graphics area was augmented with machine learning and added David Gu, Arunava Banerjee, and Jeffrey Ho. Alper Ungor and Alireza Entezari brought new strength to the existing computational geometry area. Another noteworthy faculty development was the addition of research on human and computer interaction with Benjamin Lok and Georg Essl to strengthen the digital arts and science (DAS) program. Finally, the department got a big boost in the network and security research area. The combined research of Shigang Chen, Ye Xia, Prabhat Mishra, My Thai, and Ahmed Helmy in the area is especially noteworthy. The PhD production and external funding in the department reached a new peak. Unfortunately, the second downturn of the housing market crash in 2008 put an

abrupt and complete stop to faculty growth. There was zero activity in recruiting until Daisy Wang was hired in 2011. Like the football program, we had ups and downs. Life was great for CISE, but we hit a road block toward the end of the decade.

The fourth decade has been difficult so far. After a series of annual state budget reductions, the College of Engineering proposed a budget cut plan that would move all the Computer Engineering Degree programs from CISE to the Electrical and Computer Engineering Department. Roughly half the faculty were offered the opportunity to move to other departments, to support their graduate and research mission. Those remaining in CISE would focus on teaching and advising in the existing Computer Science BS and MS programs. The proposal also called for eliminating the budget for teaching assistants. After intense negotiations, the proposed plan was not implemented. CISE retained its degree programs. No faculty moved to other departments, staff were retained, and teaching assistants continue to be supported, although CISE budgets were reduced, as were those of other departments. I hope the parallels between the

CISE program and the Gators football program continue to hold true. Gators' football has shown that it is a resilient 4th quarter team this year. I firmly believe that the faculty of CISE will be a strong team in its fourth decade. CISE will recover and emerge stronger than ever before because the urgency of forming a larger and autonomous unit, such as a school or college of computing, has never been so clear to the faculty and the administration after all the turmoil.

For more than 30 years, over 70 tenure-track faculty members have passed through the CIS(E) department and left some memorable marks. But the department's successes are also tied to other non-tenure-track faculty who carried a significant teaching load for the department. To the best of my memory and chronologically, they are Lola and Gerald Haskins, Mary Lynch, David Small, Mark Schmalz, Rory DeSimone, Peter Dobbins, Robert Cubert, Tuba Yavuz, Seema Bandyopadhyay, and Rong Zhang. I hope that this brief account of faculty in CIS(E) brings back some fond memories of the department, and please accept my apology if I missed anyone or stated some fact incorrectly. ▶



A student uses virtual reality to administer an eye exam in 2011. (image taken from virtualpatientsgroup.com)

STUDENT TRAVEL AWARDS

AWARDED IN THE SPRING SEMESTER 2012

CHUAH, JOON-HAO: "Increasing Agent Physicality to Raise Social Presence and Elicit Realistic Behavior," IEEE International Conference on Virtual Reality, Orange County, CA, Mar. 04-08, 2012.

YEO, YOUNG-IN(*): "Efficient Pixel-Accurate Rendering of Curved Surfaces," ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, Orange County, CA, Mar. 09-11, 2012.

JIN, HUAFENG: "Java Memory Model-aware Model Checking," International Conference on Tools and Algorithms for the Construction and Analysis of Systems, Tallinn, Estonia, Mar. 27-30, 2012.

LIU, XINXIN: "Traffic-Aware Multiple Mix Zone Placement for Protecting Location Privacy," IEEE International Conference on Computer Communications, Orlando, FL, Mar. 25-30, 2012.

LI, TAO: "Privacy-preserving RFID Authentication based on Cryptographical Encoding," IEEE International Conference on Computer Communications, Orlando, FL, Mar. 25-30, 2012.

QIAO, YAN: "Origin-Destination Flow Measurement in High-speed Networks," IEEE International Conference on Computer Communications, Orlando, FL, Mar. 25-30, 2012.

AWARDED IN THE SUMMER SEMESTER 2012

ZHAO, HAN: (1) "Optimal Resource Rental Planning for Elastic Applications in Cloud Market" and (2) "Designing Flexible Resource Rental Models for Implementing HPC-as-a-Service in Cloud," IEEE International Symposium of Parallel and Distributed Processing, Shanghai, China, May 21-25, 2012.

RAHMANI, KAMRAN: "Synergistic Integration of Code Encryption and Compression in Embedded Systems," ACM Great Lakes Symposium on VLSI, Salt Lake City, UT, May 03-04, 2012.

LUO, WEN: "Probabilistic Missing-tag Detection and Energy-Time Tradeoff in Large-scale RFID Systems," ACM International Symposium on Mobile Ad-hoc Networking and Computing, Hilton Head Island, SC, Jun. 11-14, 2012.

SHEN, YILIN: "Maximizing Circle of Trust in Online Social Networks," ACM Conference on Hypertext and Social Media, Milwaukee, WI, Jun. 25-28, 2012.

THAKUR, GAUTAM: (1) "A Framework for Realistic Vehicular Network Modeling using Planet-scale Public Webcams," and (2) "A Framework for Sense Planet-Scale Vehicular Mobility using Online Traffic Webcams," ACM Mobisys and Mobisys HotPlanet Conferences, London, United Kingdom, Jun. 25-29, 2012.

CHENG, JAILONG: "Dof-rigidity, a better approximation to 3D rigidity matroid," International Conference on Rigidity Theory: Progress, Applications and Key Open Problems, Alberta, Canada, Jul. 15-22, 2012.

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* Denotes College of Engineering Travel Award

CONGRATULATIONS FALL 2012 GRADUATES

DOCTOR OF PHILOSOPHY IN COMPUTER ENGINEERING

SAEED ABBASI MOGHADDAM/Dissertation Title: *Large-scale Mining of Mobile Online Behavior: Interest-aware Modeling and Design*/Advisor: **A. Helmy**

CHAO CHEN/Dissertation Title: *A Programming Model for Safer Pervasive Spaces*/Advisor: **A. Helal**

ZACHARY EZZELL/Dissertation Title: *A Unified Human Interaction-Based Theory and Framework for Simulation Modeling and Visualization Design*/Advisor: **P. Fishwick**

VIRUPAKSHA KANJILAL/Dissertation Title: *Designing, Querying, Implementing, and Integrating Spatial Networks in Spatial Databases*/Advisor: **M. Schneider**

UDAYAN KUMAR/Dissertation Title: *Identifying Social Markers from Network Data Based on Location, Mobility and Proximity*/Advisor: **A. Helmy**

HECHEN LIU/Dissertation Title: *Modeling, Representing and Querying the Uncertainty of Moving Objects in Spatio-temporal Databases*/Advisor: **M. Schneider**

S. MAHSA MIRZARGAR/Dissertation Title: *A Reconstruction Framework for Common Sampling Lattices*/Advisor: **A. Entezari**

MOHAMAD H. TARIFI/Dissertation Title: *Foundations towards an Integrated Theory of Intelligence*/Advisor: **M. Sitharam**

GAUTAM THAKUR/Dissertation Title: *A Data-driven Modeling of Large-scale Mobile Networks: Community and Vehicular Mobility*/Advisor: **A. Helmy**

MASTER OF SCIENCE IN COMPUTER ENGINEERING

Kumar Abhishek
Isha Agarwal
Rishabh Agarwal
Amruta Raghuvver Badami
Ankit Baderiya
Sagar Shankar Bhandare

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Samrat Bhattacharya
Eduardo S. Buenviaje
Rohit Chauhan
Ravi Teja Chebrolu
Chao Chen
Yu-Tseh Chi
Arijit Choudhury
Deepak Dasarathan
Gopinath Elanchezhian
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Virupaksha Kanjilal
Mukundan Kavanur Kidambi
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Sandhya Tejaswi Komaragiri
Abhishek Koneru
Swapnil Arvind Kothé
Shivendra Kumar
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Vaarij Rakesh Shah
Anurag Sharma
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Amita Singh
Damandeep Singh
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Ananthpadmanabhan Srinivasa
Ankit Srivastava
Yu-Song Syu
Shaojun Tang
Sri Ramya Tangellamudi
Rishitesh Thakur
Shivam Tiwari
Neha Uppal
Ajithkumar Vasanthakumar

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Prithvi Raj Venkat Raj
Phuong T. Vo
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Robert J. Wilson
Nan Zhang
Pan Zhang

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Ainsworth Jackson
Carolina Laguna
Adam Pietrafesa

CISE CAREER DEVELOPMENT WORKSHOP

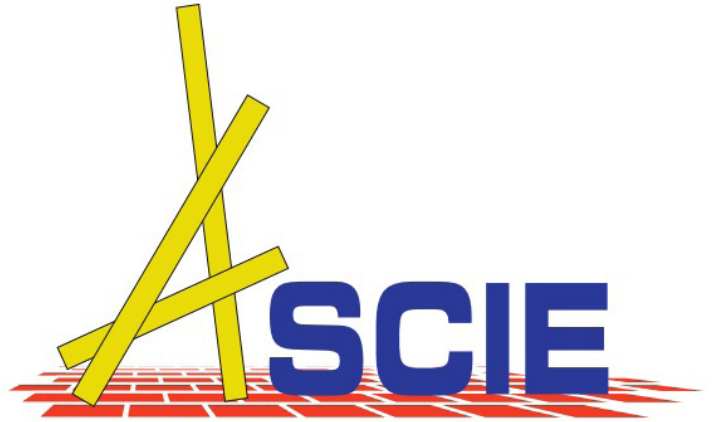
The 11th Biannual Career Development Workshop took place on October 1st, 2012, in the Grand Ballroom of the J. Wayne Reitz Student Union. The CISE Department hosted 17 companies, ranging in size, shape and scope from partners here in Gainesville to huge corporations that do business on an international scale. The companies and institutions in attendance were: 352 Media Group, Amazon, American Express, Bloomberg, Chico's, ExxonMobil, GE, Google, Harris Corporation, Infinite Energy, Microsoft, MindTree, Office Depot, Raymond James Financial, Ultimate Software, the University of Central Florida, and Walt Disney World.



CISE students talking with recruiters at the Career Development Workshop

This was the second CDW held in the Grand Ballroom, and we spent weeks organizing and promoting the workshop to our CISE students. The ballroom was filled to capacity with students, industry leaders, recruiters and our student volunteers from organizations like ACM and ASCIE. The Career Development Workshop is one of the events that the CISE Department works to continue to improve, and we look forward to hosting the 13th Biannual CDW on February 4th, 2013. We welcome current and former students to participate in this wonderful opportunity to network with top companies around the country to find first-rate internships and post-graduation positions.

Check us out on the web: <https://www.cise.ufl.edu/careerworkshop/> ►



Nuri Yeralan, ASCIE President

ASCIE is CISE's official department graduate student group that offers opportunities for students to meet, socialize, study, and serve the department while pursuing their studies at the University of Florida. Fall 2012 was an exciting semester for us! This year's graduate student orientation featured an ASCIE panel discussion where a mix of Masters and PhD students shared their experiences and advice about taking classes, studying for qualifiers, and settling into Gainesville student life. In October, ASCIE and ACM helped the department host one of the most successful Career Development Workshops in recent memory. Through fellowship, scholarship, and leadership, ASCIE significantly enriches CISE graduate student life at the University of Florida. ►



High School students participate in ACM's annual High School Programming Contest.



Joe Thuemler, ACM Vice President

Any undergraduates who wish to get more involved in their community, beef up their resume, or gain some practical programming experience should join UF's chapter of the ACM. There are many different parts to ACM, ensuring that there will be a group of interest for everyone. ACM has a world-renowned Programming Team that studies algorithms and competes in local, national, and international contests regularly. There is the Software Development Club, which organizes groups of students to work on real-world software projects and brings in experienced professional developers to speak about the work they do in the industry.

Info Sec, also known as the Hacking Team, is another one of ACM's groups--they participate in contests, teach their members about proper web security techniques, and are involved in events such as ITSA Day. We host a yearly High School Programming Contest, to give back to the community, inspire a love for Computer Science in high school students, and promote UF's Computer Science program. ACM regularly invites speakers from prominent companies such as Google, Amazon, Microsoft, and Nielsen to give presentations and collect resumes. We also host social events, such as our regular Coffee and Donuts event, to bring undergrads together with their professors over some free food and fun. ACM members have received job offers this year from Google, Facebook, Microsoft, Amazon, Ultimate Software, and many other excellent companies. No matter what your persuasion is, ACM has groups and events that you'd love. ►



ACM Students on the Programming Team.

STAFF NEWS

NEW STAFF MEMBERS



**DOUG DANKEL,
UNDERGRADUATE
COORDINATOR**

Dr. Dankel joined CISE in 1979 and was recently appointed undergraduate coordinator. In this role he will increase undergraduate recruiting, retention, and diversity; deal with advising problems and issues; and strengthen our undergraduate programs. In his spare time he enjoys Sudoku, photography, and travel. He recently adopted two adult shelter cats.

STAFF SPOTLIGHT

TODD BEST, Undergraduate Academic Advisor



Todd Best is in his 4th year as an academic advisor for undergraduates in CISE, having joined the department in September 2009. He advises around 350 students in Computer Science (Engineering and Liberal Arts and Science), and Digital Arts and Sciences. In addition to his role in the department, Todd is active in the Engineering Advising Council, and he currently serves as Chair of the EAC. One of the things he enjoys most in his work is helping students think about the big picture of their educational experience - how to make the most of it now, and how to see it leading beyond the undergraduate years. He holds an M.A. in Religious Studies (UF, 2002), where his emphasis was in educational philosophy. He considers advising as one of the primary ways that a large institution like UF can be refocused on the students who are being shaped here. Beyond his work in the department, this spring Todd is teaching a course in the Honors Program. He enjoys discussing literature, film (especially documentary), and the arts, as well as exploring the uniqueness of Gainesville and North Florida.

Ricky Whitney joined CISE in July after transferring from the UF Central Human Resources Recruitment and Staffing Department. He is currently pursuing his bachelor's degree here at UF. As an office assistant he is responsible for handling graduate assistant appointments, assisting with fiscal responsibilities, and assisting with departmental reconciliations. Ricky enjoys mountain biking, chasing his children, and working with electronics.



**RICKY WHITNEY,
OFFICE ASSISTANT**



**ANA MEYER-RUIZ,
GRANTS SPECIALIST**

Ana Meyer-Ruiz joined CISE in Nov 2012 as a Grant Specialist. In her role, Ana manages the pre-award and post-award activities of the sponsored research for the department. Ana has a Bachelors degree from Saint Leo University in Accounting, and is currently pursuing a Masters Degree in Accounting with specialization in Forensic Accounting/Fraud Investigations from FAU. In her free time, Ana likes to cook, read and spend time with her family.



**DEPARTMENT OF COMPUTER &
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Editor: Jennifer Jackson

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