Scholars, Mentors, ECE Faculty, Corporate Sponsors, and guests gathered to recognize the accomplishments of the ECE Opportunity Research Scholars at the 7th Annual Awards Banquet on Monday, April 13. This event is the culminating program experience for the ORS Scholars and one they’ve worked toward for two semesters.

Throughout the day ECE faculty listened to presentations and viewed posters detailing the research efforts of the ORS Scholars in order to judge them based on several key attributes such as research knowledge and quality as well as oral presentation and visual display. Awards were given for the first poster, second place poster, and best presentation based on the outcome of the faculty judging. Scholars also had the opportunity to judge the posters, which were on display. The “People’s Choice” award, based on peer judging, was also given.

Special guests included Wajih Elsallal from Rockwell Collins, Nadia Schwartz from EFACEC, Scott Wilkinson from Hitachi, Rick Hartlein and Frank Lambert from NEETRAC, and the ECE School Chair Dr. Gary May.

**Research Award Winners**

**1st Place Research Poster Award**
The Tongue Driver Group, Xueliang Huo (Mentor), Jeremy Jones, Asma Qureshi, and Jeremy Thompson (Scholars) with Dr. Maysam Ghovanloo (Faculty Sponsor) and Wajih Elsallal (Rockwell Collins-group sponsor).

**2nd Place Research Poster Award**
The Propagation Group, Scholars Dawn Tall, Alvin Chou, and Courtney Drewski sponsored by The School of Electrical and Computer Engineering.

**Best Research Presentation Award**
Particle Swarm Optimization, Scholar Michael Digman, Sponsored by PURA (President's Undergraduate Research Award).

**People’s Choice Research Award**
The Communications Systems Center Group, Scholars Jeff Lumish and Joey Yore sponsored by The Rockwell Collins Corporation.
From the Director: The Year in Review

Looking back over the year, ORS expanded in many ways, from the staff to the number of groups to industry sponsors. Beginning with program staff, we enthusiastically welcomed Julie Ridings as the new Program Coordinator. Julie’s background as an ECE Academic Advisor along with her strong organizational skills made her a perfect fit. Over this past year, Julie has counseled many Scholars in time-management skills and course planning, developed a systematic budget process that requires Scholars to work their research hours, and get them paid as well! These are just a handful of the numerous contributions Julie has made to ORS. With this solid foundation, we can look forward to other quality improvements for next year.

Disseminating timely and relevant information is essential to the success of a program like ORS. With the assistance of our GTA Nashlie Sephus, we were able to meet this challenge. Nashlie’s computer and creative skills contributed to our updated newsletter format, which has helped to streamline the number of email messages we send to Scholars and Mentors. As an ECE graduate student who has expertise in many of the research topic areas, Nashlie filled an important gap for ORS. This expertise was particularly valuable when Scholars wrote their own research abstracts and developed research posters. Nashlie will begin her own research this summer, but we hope that she can remain on the ORS staff for one more year.

This was year of growth in other ways. At the close of the academic year, there were 11 ORS groups, most with three Scholars. Several new faculty advisors joined our ORS community this year including Professors Tom Michaels, Patricio Vela, Emmanouil Tentzeris, Maysam Ghovanloo and Deepak Divan. ORS also gained a new industry sponsor this past year, Rockwell Automation, thanks to the effective “networking” by Professor Michaels, who linked ORS with this company. Currently, the ECE Development Staff is out pounding the pavement to secure additional industry sponsors for the 2009-10 program year.

Undoubtedly, the 2008-09 year was one of continuous change and growth. With the addition of new research laboratories, ORS added several new Mentors during the year. This is a departure from previous years when new groups were usually added only at the beginning of the academic year. Now that we have our staff in place, a wide variety of research topics, and a strong core of Mentors, our goal for the 2009-10 program is for all research groups to be up and running at the beginning of fall semester. Thus, after a year of growth spurts, ORS will return to the regimen of two-full semesters of research for all groups that culminate in high-quality research posters. We will kick off the next program year with a comprehensive mentor-training session and Scholar orientation.

Several Scholars were PURA recipients this past year, and others elected to conduct research for credit. These options add to the flexibility of ORS so that we can best meet the needs of our Scholars. We hope to introduce ways that seamlessly integrate all these options into our program. Speaking of flexibility, Sean Sanders was the first Scholar to conduct research at GTL, and was the first ECE student to have a GTL PURA grant.

As ORS continues to grow, so do the participants, many of whom are completing their degree programs. This was the last year for several of our Mentors. Ryan Pirkl, a three-year ORS Mentor from the Propagation Laboratory, will be heading to Boulder, Colorado for a post-doc position. Ryan is a role model for other mentors, and he will be missed. Like his faculty advisor, Professor Greg Durgin, Ryan always gives 100% to his students. He is the first to volunteer to serve on panels, speak at ORS events, or just to lend a hand when needed. Lorne Liechty, also from the Propagation Laboratory, will be leaving for Texas at the end of the summer. Of all of our Mentors, Lorne has had the most obvious impact on his scholars, influencing one to attend graduate school, helping another to make difficult life decisions, and finding ways to empower his Scholars beyond teaching research skills. Finally, we reluctantly let Kevin Fairbanks off the “mentor hook.” Kevin extended his time as a Mentor in order to permit continuity for specific Scholars. Between teaching an ECE course, making progress towards his own degree and managing Scholars working on three different projects in two different countries, Kevin went beyond the call of duty. And, Kevin set a high standard for departing mentors by identifying a potential new mentor in his same research area for next year! We will have a huge gap to fill in our program with the absence of Ryan, Lorne, and Kevin.

Like other aspects of ORS, this past year was one of growth for the most important part of the program, the Scholars. With the addition of research for credit and PURA awards, our community of Scholars expanded. Those 3rd year Scholars who will not return to ORS next year are encouraged to follow the lead of former Scholar Melissa Watkins. Not only did Melissa attend several ORS 2008-09 events, she linked into the ORS support system for a high school outreach project through SWE and thus was able to include an ECE lab tour for the students.

The overriding philosophy of ORS is to create a community among those of us in the program, and Scholar input is crucial to achieving this. To those of you staying with ORS next year, we will ask for your help in this effort. And, to Charles, Jerome, Melissa, Dawn, maybe Seema and Rodrigo, Nicole, Major and Veronica, please stay in touch and if at Georgia Tech, stay involved with ORS!
ORS Involved In Outreach

Seventy-five local high school students and their parents visited Georgia Tech to learn more about engineering on Saturday, March 7. Ryan Pirkl and Matt Trotter, ORS Mentors, and Seema Bhandari, Courtney Drewski, Santiago Hassig, and Rodrigo Quinteros, ORS Scholars, gave a tour of Dr. Greg Durgin’s Propagation Lab to a group of high school girls as part of the Society of Women Engineers High School Outreach Program. Nicole Rennalls, also an ORS Scholar, participated in the Q&A Panel. The tour and panel were part of a full day visit for the group. Melissa Watkins 2008-09 ORS Scholar, was the Event Organizing Chairperson. The day began with a general engineering presentation which covered what engineering is, different engineering branches and careers, and the engineering process. A hands-on project, a robotics presentation, a lab tour, a corporate speaker, an EcoCar Presentation, and a question and answer panel rounded out the program.

“The day was a huge success”, said Melissa Watkins. “The girls felt the program was very worthwhile and they are highly intrigued with the diverse engineering careers/programs that were presented,” commented an attending teacher as she expressed her thanks.

The event has expanded to occur each semester rather than annually to accommodate demand. Over 400 girls applied to the program Fall 2008.

Spring ORS Workshops

Part of the benefit of participating in The ORS Program is the availability of enrichment workshops that provide the Scholars with a chance to improve their skills. During the spring semester ORS held workshops that focused on preparing for graduate school, research poster creation, research presentation preparation, and PURA proposal writing (President’s Undergraduate Research Award). Encouraging growth through workshops is a key element to the ORS Program that promotes Scholar success.

Special Thanks

On behalf of the ORS program, we would like to say thanks to the ECE faculty, staff, and friends who helped with the Poster and Presentation Competition and The Awards Banquet. Much effort went into the preparation, set up, and judging, and it was a great success due to the input of many. Thank you to Kristen Anderson, Christina Bourgeois, Tom Collins, Bonnie Ferri, Diana Fouts, Ron Harley, Leslie Hudson, Joe Hughes, Steve Kenney, Gary May, Deborah Milliner, Andy Peterson, Marci Reed, Bev Scheerer, David Taylor, Linda Wills, and Brenda Wright. As always, we greatly appreciate your help.

Opportunity Research Scholars’ Program, Volume 2, Issue 4
Meet the Rockwell Collins sponsored Propagation Group II, Lorne Liechty, Mentor, and Alvin Chou, Courtney Drewski, and Dawn Tall, Scholars. Their faculty advisor is Dr. Gregory Durgin.

Tell us what the Propagation Group's project is about.

Lorne
We are designing a simple wall covering that can selectively block wireless internet signals from leaving your house! This is the ultimate in wireless network security!

Tell us a little about your background and why you chose engineering.

Lorne
I’m from Texas and got my BS in EE from Texas A&M. I received my MS in ECE from GT in 2007 and expect to finish my PhD in ECE in 2010. Since 2006 I have been working full-time for Motorola while continuing my graduate studies. I married superwoman in 2005, and we have 2 daughters ages 2.5 and 1 month.

Alvin
I’m from Alpharetta, GA. I’ve decided to come to Tech for Electrical Engineering because of the outstanding program and the practically free tuition for in-state students. I am also interested in other fields of engineering, like mechanical and particularly, aerospace engineering. Also, I like to sleep!

Courtney
I am currently a sophomore Electrical Engineering student from Southlake, Texas. I chose Georgia Tech for its ability to consistently challenge its students and its outstanding Engineering reputation. I have always had a fascination with electricity and loved working with circuits in Physics. Recently, I have discovered my interest in the Telecommunications industry, which is why I love my research with the Propagation Group.

Dawn
My name is Dawn Tall and I am in my fourth year at Georgia Tech majoring in Electrical Engineering. Currently I live in Augusta, GA but I am from all over because my dad was in the military. I picked EE because while I was in GT 1000 for confused engineers I identified more with the presentations on EE. The other presentations were just boring to me. In my spare time I enjoy sleeping, reading and watching scary movies.

Why did you decide to participate in the ORS Program?

Lorne
I joined ORSP because I love working with undergraduate students. I love the program because it gives me the opportunity to train the next wave of researchers. I get to see them develop from clueless freshman into capable researchers! Someday my brainwashing will be complete and they will go out into the world and realize all of the crazy dreams I shared with them while they were under my tutelage.

Alvin
I’ve decided to join the ORS Program because I feel like it’s something I would enjoy doing. And what’s better than getting paid for doing something you love to do?

Courtney
I have always had an interest in participating in research during college and the ORS Program offered the perfect opportunity. Moreover, the ORS Program provided the means to narrow my focus within my major.

Dawn
I decided to participate in ORS because I was interested in getting into the research side of EE. I did not know what exactly I wanted to do when I graduated. Did I want to do research or get into industry? I enjoy ORS because I think that it offers a little bit of both sides. I do research and sometimes I get to make products that other people could use in real life.
Meet the Intel sponsored Human-Automation Systems Lab group members, Lonnie Parker, Mentor, and Odile Mugisha and Joleon Pettway, Scholars. Their faculty advisor is Dr. Ayanna Howard.

Tell us what the Human-Automation Systems Lab project is about.

Lonnie
The project involves characterizing an unknown terrain. Given a robotic platform, tilt sensors and pre-defined navigation algorithms, the aim is to provide useful information about an uncharted area of land and relaying that information real-time to a remote workstation.

Tell us a little about your background and why you chose engineering.

Lonnie
I’m from Pittsburgh, PA. A 2-week summer engineering program at Georgia Tech in 1999 called PREP (Pre-college Engineering Program) got me into engineering. I had actually applied to another summer program emphasizing business, but I got rejected, so I came to visit Georgia Tech instead...the rest is history. Why Tech? I majored in Electrical Engineering specifically because, although I honestly didn’t know much about engineering, my educated guess was that EE offered a lot more broad opportunities down the road...who knew! For undergrad, I was rejected from Tech...so I was always bitter and waiting for the chance to come back and prove myself...again...who knew? When I actually have free time, which is rare, I play guitar and tennis.

Odile
I am from Rwanda, Central Africa. I was introduced to engineering by my father who is an agricultural engineer. He told me to go learn, and change, and influential be. Therefore, I chose to pursue a career in electrical engineering. I chose to come to Georgia Tech because it is “Georgia Tech”. I know thousands of students who would give up everything they have to come to this school, I took advantage of the opportunity. My other interests are reading non-fiction and psychology.

Joleon
I am a 5th year electrical engineering major from Mobile, Alabama. I chose to pursue engineering because I performed well in math and science classes in high school, and I specifically chose electrical engineering because I wanted to place myself in a field directly related to developing new technologies in computing. I chose to attend Georgia Tech because it had one of the top engineering programs in the nation, being in the Atlanta area appealed to me, and it wasn’t that far from home.

Why did you decide to participate in the ORS Program?

Lonnie
I knew that I would need to learn about mentoring in some capacity and I also thought it would be a useful way to participate in the process of creating an initial idea and then work with undergrads, having them help shape the direction it takes, the same way my advisor worked with me as an undergraduate.

Odile
I chose to participate in ORS because of Jill, Lonnie, Julie, and Dr. Howard. You can quote me on this one!

Joleon
I chose to participate in ORS because I wanted to gain some research exposure. I am coming into my last year of my undergrad career at Tech and I have been thinking about pursuing my masters in electrical engineering. The research that I do with ORS will give me valuable experience that I will be able to utilize if and when I decide to go to graduate school. I believe ORS is a good program because not only does it give undergrads research experience but provides them with a support system to assist them with their research and school work of not only ORS coordinators but also Georgia Tech faculty, PhD students, and other undergrad students in the program.
ORS Program Overview

What is Opportunity Research Scholars’ Program (ORS)?
ORS is an innovative program that provides Scholars with a structured undergraduate research environment with direct leadership from PhD Mentors. At the heart of the model is a series of research groups (11 groups in 2008-09). Each group is composed of 3 undergraduate students and a PhD mentor who are actively engaged on a research project. Undergraduate students are exposed to the laboratory environment, gain research and presentation skills, and have opportunities to interact with industry sponsors as well as regular exposure to research faculty and graduate student Mentors.

What is the purpose of ORS?
The ORS model is intended to increase student retention and academic success in electrical engineering and computer engineering at Georgia Institute of Technology.

Why the link between ORS and Industry?
ORS creates a direct pipeline to students who have on-going research experience. The nature of the research projects requires students to persevere through the ups and downs of the research cycle. They are encouraged to think for themselves, take initiative and learn additional skills while under the guidance of the PhD and faculty Mentors. These are students who are competitive candidates in the job market and graduate school.

Why ORS is successful?
The ORS support structure is driven by studies on student success that consistently validates the relationship between student “engagement” and academic success. This is achieved by a highly structured enhancement program that consists of academic workshops with faculty members, mentoring relationships with industry representatives, faculty and graduate students, skill-based research workshops, collaborative learning style-projects and other activities to promote student satisfaction with their educational experience. Thus, the engaged students are more likely to remain in college and graduate.

Results of ORS
ORS students are fully engaged in the department with ongoing research projects, publications, leadership positions and are competitive contenders in the job and graduate school markets.

“ORS is a model that increases student engagement, retention, and success.”

Goodbye To Mentors Moving On
ORS scholars, mentors, and staff would like to say goodbye to Mentors Ryan Pirkl and Lorne Liechty. Ryan has been an outstanding mentor for three years and will graduate Fall 2009. He will begin a post-doctorate position in Colorado this fall. His most favorite aspect of the ORS program was working with the undergraduate students. He stated, “They are less jaded/cynical than us graduate students.” Also, Lorne Liechty will be moving with his family, including his newborn baby girl, to Texas to finish his dissertation. He has been an excellent Mentor for two years and states “I like being able to share my experiences with the scholars so that they feel more comfortable with research.” We wish them the best in their future endeavors. Both Ryan and Lorne will truly be missed.

Ryan Pirkl, Lorne Liechty
### Opportunity Research Scholars’ Program

This program would not be possible without our Sponsors! Thank You!

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http://www.ece.gatech.edu/enrichment/ors/