ORS Kicks Off to a Good Start

On September 21st, returning and new scholars, PhD mentors, and faculty advisors met for the ORS Kick-Off Meeting. The event began with an introduction from the Program Director, Jill Auerbach. Jill introduced the group to this year’s theme of skill development, while attendees munched on tacos and nachos from Moe’s. Guest speakers Dr. Greg Durgin, faculty advisor, and Matthew Trotter, PhD mentor, emphasized experiences. Dr. Durgin described how his exposure to faculty and research as an undergraduate student influenced his decision to go into academia. Matt encouraged scholars to measure success not just by tangible products, but by technical and teamwork skills gained.

Next, faculty, mentors and scholars alike were challenged to find things in common with their fellow ORS Program participants. They were charged with the task of getting signatures from as many people as possible with the same responses to various questions in 3 minutes. Sahitya Jampana, Lokesh Akkipeddi, Vernell Woods, and Laura Vogelaar received prizes. Finally, Jill gave an overview of the year ahead. The event gave students the opportunity to get acquainted with other ORS members and to overview the expectations and events of the upcoming year.

Scholars Learn Research Skills

On October 1st scholars and mentors attended a workshop aimed at outlining basic research skills. Jill Auerbach started off the event by giving an introduction and brief explanation about project summaries. Students then split into their ORS groups to come up with one-minute elevator talks. Groups shared their talks and received feedback from seasoned scholars Courtney Drewski, Seema Bhandari, Sean Sanders, and Rodrigo Quinteros. Next Seema and Rodrigo gave tips on defining goals and showed examples from previous years. Courtney shared some insight on writing about the background and importance of one’s research, and on putting the research in context. Sean then discussed an abstract example from PURA. Finally Jill and the workshop leaders shared examples of presenting schedules with varying detail. Students left the event prepared to write their own project summaries.
On August 25th, mentors gathered to explore strategies of positive mentorship of undergraduates in preparation for the year in research. Jill Auerbach discussed project options and approaches to beginning a new project. Mentors Lonnie Parker and Amin Rida shared their insight on these topics.

**Mentors Train to Impact Scholar Success**

On August 25th, mentors gathered to explore strategies of positive mentorship of undergraduates in preparation for the year in research. Jill Auerbach discussed project options and approaches to beginning a new project. Mentors Lonnie Parker and Amin Rida shared their insight on these topics.

**Welcome Back, Returning Scholars!**

Scholars continuing with the ORS program met with mentors on August 25th to discuss research area options for the upcoming year. Returning scholars have the first opportunity to select new research groups at the beginning of each program year.

**Recruiting Events Bring in New Scholars**

The ORS Information Session, ECE Rush, and GT Family Weekend events increased visibility of and interest in the ORS program. At the Information Session on August 27th, Jill spoke to prospective scholars about the responsibilities and benefits associated with joining ORS. Several returning scholars and mentors described their research projects and answered questions.

On the same day ORS members took part in ECE Rush, showcasing an informational poster and last year’s Tongue Drive poster. Several scholars and mentors were on hand to describe the program to interested students.

At a GT Family Weekend event on September 25th, scholars, mentors, and staff described the ORS program and discussed their projects. These events contributed to the addition of fifteen new scholars this year. Special thanks to all the students who volunteered!

**Message From the Director: Focusing on Skills**

What makes a successful undergraduate research experience? I ask myself this question at the beginning of each year. To me, it is important to periodically reassess how we do things. Think of a vaccine, for example a flu vaccine, which is effective in preventing 80% of flu strains in a given year. Is that good enough? At what point do we accept that additional coverage of strains are not worth the effort? While improving ORS may not be of the same magnitude of flu vaccine coverage, the point is the same. ORS is a thriving program with sustained funding, coveted research positions and a waiting list to participate. Is that good enough?

My goal is to take ORS another step and enhance technical skill development that, over time, contributes to higher-level thinking skills. The challenge in a program like ORS is that students come to the program with varying levels of knowledge, experience and confidence. My observation is that most Scholars do exhibit gains in technical skills and experience growth-spurts in confidence. Since I am a social science researcher, informal observation and anecdotal “data” is not sufficient. Thus, over the next several months, I will be working on a systematic methodology to ensure that students not only perform technical tasks, but that those tasks serve as a foundation towards a more advanced skill-set.

At the orientation, one of our returning mentors, Matt Trotter, addressed the group and discussed the three objectives he sets for his Scholars. The first is that each Scholar must learn new technical skills, regardless of their beginning point. Second, Scholar’s need to intentionally develop the skills needed to work effectively as a research team and third, each Scholar is responsible to “get the job done.” Matt is on the road to becoming an insightful professor, because he succinctly laid the groundwork for the year ahead.

BTW: I still need to get my flu shot!
Meet the Mentors!

Debrup Das  
Dr. Deepak Divan; Intelligent Power Infrastructure Consortium (IPIC)

Debrup is in his fourth year as a PhD student and his second as an ORS mentor. He is finished with his PhD coursework. He came from India and loves cricket, Hollywood films, music, and Indian food. Debrup likes to play tennis and has been trying his hand at poker lately.

Kevin Fairbanks  
Dr. Henry Owen; Network Security and Architecture Lab (NSA)

Kevin is a 5th year PhD student and 3rd year mentor. He has completed his coursework and proposal, and is currently working on his thesis. His current ambition is to leave Georgia Tech with his PhD in May 2010!

Abhilash Goyal  
Dr. Madhavan Swaminathan; Mixed Signal Design Group of EPSILON

This is Abhilash’s first year as an ORS mentor. He is a fourth year PhD student and passed his proposal exam! His research focus is self-healing mixed-signal 3D-IC sytems. Abhilash loves doing Yoga “Art of Living”.

Stefan Grubic  
Dr. Thomas G. Habetler; Power Lab/Machines Lab

Stefan is a third year PhD student and ORS mentor. He is done with his coursework and qualifying exam. He loves snowboarding, photography, travelling, eating, cooking, and sleeping. He also plays guitar and does a bit of songwriting.

Ler Gullayanon  
Dr. Thomas E. Michaels; Quest Lab

This is Ler’s first year as an ORS mentor but her second as a PhD student. She passed her proposal and is now working on remaining research. She enjoys movies, good food, and horseback riding.

Jiaqi Liang  
Dr. Ronald Harley; Electric Power Lab

Jiaqi is a first time mentor but a third year PhD student. He is currently finishing his coursework. He is from China and likes playing basketball. He also enjoys travel and all outdoor recreation.

Xue Liang Huo  
Dr. Maysam Ghovanloo; GT-Bionics Lab

Xueliang is in his second year as an ORS mentor and third as PhD student. He is finishing his last minor course and is preparing for his proposal next semester. He is a soccer lover!

Myounghwan Lee  
Dr. John A. Copeland; Communications Systems Center

Myounghwan is a first year ORS mentor and a third year PhD student. He plans on doing his proposal this semester. He would like us to know that he lives with the most beautiful wife.
Which ORS group are you in and what are you currently working on?
I am in the Propagation Group. We are designing an antenna pattern visualization system that will serve as a teaching aid and will help students understand basic antenna radiation concepts and properties.

Why did you decide to participate in ORS and what do you like most about the program?
I thought it was a great opportunity to obtain undergraduate research experience that would help me prepare for graduate school. Some of the aspects I like most about the program are applying the concepts learned in my classes and getting to use equipment and software that is used in industry. I also enjoy sharing my experiences with graduate students. They often clear some of my doubts about graduate school and other subjects.

What are your plans after graduation?
During the summer after graduation, I plan to travel Europe with a couple of friends. After that I will either work or start grad school.

What do you hope to be doing 20 years from now?
I like teaching and hope to one day become a professor at a university.

What was your favorite class at Georgia Tech and why?
I liked ECE 4752: IC Fabrication because the lab component consisted of processing a wafer from the start to packaging. I kept my wafer at the end of the semester. Also, I learned more about semiconductor theory and devices in this class than in ECE 3040.

What are some of your interests outside of school?
During my free time I like to watch and play sports like soccer, volleyball and racquetball. I also like eating food from different parts of the world.

Where are you from?
I was born and raised in Bolivia. I came to the U.S. 6 years ago for high school and college.

If you could go anywhere, where would you go?
I would go to Spain because I like its cities and its culture.
Faculty Spotlight: Dr. Ron Harley

What is your lab or group name?  
Computational Intelligence in Power

Describe the main research being done at your lab.  
We apply computational intelligence (neural networks, fuzzy logic, genetic algorithms, and particle swarm optimization) techniques to optimize the control of parts of a power system and to optimize the design of special electrical machines.

Where did you get your degrees?  
I received my Bachelor’s and Master’s degrees from the University of Pretoria in South Africa, and my PhD from the Imperial College, University of London.

How long have you been at Georgia Tech and what initially drew you here?  
10 and a half years. I was drawn here by the prospect of research collaboration with colleagues and the excellent ranking of this University.

How long have you been involved with the ORS program?  
6 years.

What do you like most about being a professor?  
Having my own working hours.

What is one piece of advice you would like to give to undergraduate students?  
Never think that everything is known or that it has all been done.

Are there any interesting facts you would like us to know about you?  
I am an IEEE Fellow and recently received an IEEE Field Award with citation “For contributions to monitoring, control and optimization of electrical processes including electrical machines and power networks”.

Research Group Spotlight: Intelligent Power Infrastructure Consortium Group

This issue’s spotlight is on the group working with the Intelligent Power Infrastructure Consortium, mentored by Debrup Das. The scholars in the group are Nanley Chery, Raymond Engle, and David Saenz Landazabal. All three are second year GT students but Nanley and Raymond are newcomers to the ORS program while David is in his second year. Raymond is from Frederick, MD, Nanley from Dacula, GA, and David from Medellin, Colombia.

What is the overall goal of your group’s project?  
Debrup Das: The goal is to come up with solutions that will enable us to optimize the utilization of the existing grid assets. Controllable Network Transformers (CNT) are simple load tap changing transformers that are augmented using fractionally rated power electronic converters in order to achieve grid power flow control. In this project we aim to find the optimal settings of multiple CNTs in a power network using genetic algorithms.

How do you and your scholars divide the work in your group?  
Debrup: Nanley and Raymond are in the background study phase, so their job right now is to read 2 semesters worth of material in 2 months. David has started understanding and modifying a 3rd party Matlab code for load flow.

What is your role in meeting your project objective?  
Nanley Chery: My eventual role is to help implement an algorithm for a meshed-power-grid in MATLAB. Right now however, I am learning the EE background material.

Raymond Engle: So far my role is to master higher level ECE skills since I am just starting out.

David Saenz Landazabal: As of right now, my role includes modifying the newton raphson algorithm for power flow analysis found in the MATPOWER M-file package.

What skills are you developing through ORS?  
Nanley: Through ORS (and thanks to Mrs. Ridings), I’m developing better time-management and planning skills.

Raymond: I have been developing many of the basic ECE skills that I will need to work on our project. I am mostly working on improving my skills with AC circuits right now.

David: Coding (MATLAB), time management, team work.

What is the most challenging part of being on a team?  
Nanley: It’s not really a team issue, but the most challenging part is meeting individual deadlines while balancing other school activities.

Raymond: Trying to fit in all the studying I need to do to catch up with all of my classwork.

David: Communication.

What do you like most about working on a team?  
Nanley: I like the fact that I can work with a group member if I get stuck on a tough problem or a concept I’m trying to learn.

Raymond: It is nice to have other students in the same boat as me. We can work together to solve any problems that come up and can do better as a team then as individuals.

David: The ability to “divide and conquer”.

The group works together to solve power problems.
## Opportunity Research Scholars' Program

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

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Research Group</th>
<th>Faculty Mentor</th>
<th>PhD Mentor</th>
<th>Scholars</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Science Foundation</td>
<td>Electric Power Group I</td>
<td>Dr. Tom Habetler</td>
<td>Stefan Grubic</td>
<td>Shruti Batra, Sharan Parikh</td>
</tr>
<tr>
<td>Rockwell Automation</td>
<td>Microwave Group</td>
<td>Dr. Tom Michaels</td>
<td>Ler Gullayanan</td>
<td>Constance Brown, Pujita Vijayvargiya, Nidhi Joshi</td>
</tr>
<tr>
<td>Rockwell Collins</td>
<td>Electric Power Group II</td>
<td>Dr. Deepak Divan</td>
<td>Debrup Das</td>
<td>Nanley Chery, David Saenz-Landazabal, Raymond Engle</td>
</tr>
<tr>
<td></td>
<td>Electric Power Group III</td>
<td>Dr. Ron Harley</td>
<td>Jiaqi Liang</td>
<td>Chandim Chatterjee, Yujie Fu, Lokeshwar Akkipeddi</td>
</tr>
<tr>
<td>School of ECE</td>
<td>Wireless Mesh Networks</td>
<td>Dr. John Copeland</td>
<td>Myoungwan Lee</td>
<td>Asma Qureshi</td>
</tr>
<tr>
<td>Science Applications International Corporation</td>
<td>Human-Automation Systems Lab</td>
<td>Dr. Ayanna Howard</td>
<td>Lonnie Parker</td>
<td>Marcus Chavis, Britanny English</td>
</tr>
<tr>
<td></td>
<td>Network Security and Architecture Lab</td>
<td>Dr. Henry Owen</td>
<td>Kevin Faibanks</td>
<td>Sean Sanders, Sahitya Jampana</td>
</tr>
<tr>
<td></td>
<td>Systems and Controls Group</td>
<td>Dr. Patricio Vela</td>
<td>Miguel Serrano</td>
<td>Jeff Lumish, Joey Yore</td>
</tr>
<tr>
<td>SRC Semiconductor Research Corporation</td>
<td>Mixed Signal Design</td>
<td>Dr. Madhavan Swaminathan</td>
<td>Abhilash Goyal</td>
<td>Seema Bhandari, Penyen Chi, Brett Ireland</td>
</tr>
<tr>
<td>Education Alliance</td>
<td>RFID Group</td>
<td>Dr. Manos Tentzeris</td>
<td>Amin Rida</td>
<td>Sam Elia, Sebastian Palacios, Lauren Vogelaar, Vernell Woods</td>
</tr>
<tr>
<td>Intel</td>
<td>Tongue Driver Group</td>
<td>Dr. Maysam Ghovanloo</td>
<td>Xueliang Huo</td>
<td>Jeremy Jones, Sandhya Rajaraman, Felipe Salazar, Jeremy Thompson</td>
</tr>
<tr>
<td></td>
<td>Wireless Power Techniques</td>
<td>Dr. Greg Durgin</td>
<td>Matt Trotter</td>
<td>Courtney Drewski, Santiago Hassig, Jayson Jenkins, Rodrigo Quinteros</td>
</tr>
</tbody>
</table>

Jill Auerbach, Program Director, Van Leer E468
jill.auerbach@ece.gatech.edu
Julie Ridings, Program Coordinator/Editor, Van Leer E470
julie.ridings@ece.gatech.edu
Vedrana Novosel, Graduate Teaching Asst., Van Leer E472
vnovosel@gatech.edu

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