IEEE Newsletter

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December

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7	8	9	10 Classes End!	11 Reading Days (No Classes)	12 Reading Days (No Classes) Deadline for Course Evaluations	13 Final Exams
14	15 Final Exams	16 Final Exams	17 Final Exams	18 Final Exams	19 Commencement Final Exams	20 Commencement Winter Break Begins!
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Time Flies

It seems like yesterday I was writing, welcome back to a new semester. It seems like it was yesterday when I was oh so scared to take my first class with Professor Schwartz. However, somehow, we are three weeks from the end of the Fall 2014 semester!

I hope you had a wonderful Thanksgiving. I hope you gave thanks for your family, friends, and the opportunity of attending a great university as UF. I also hope you had time to recharge energy to survive finals.

Motivation: after finals, winter break begins!

If you are graduating this semester, Congratulations! You have gone through a journey in which hopefully you learned about the beauty of math, physics and everything in between. I know your future is bright. Wherever you go remember to be proud to be a gator!

May you have a happy, safe winter break. Happy Holidays!

-Valentina Rendon, CE Junior

Mission Statement

This monthly newsletter will inform, entertain, and connect the students of Electrical and Computer Engineering at the University of Florida. This newsletter links students to our university and future workplace by presenting articles on our department, industry, and events hosted by the different campus organizations.

The IEEE Newsletter needs your help in making this a better newsletter. Please email your comments, events, and ideas to **ieee.uf.newsletter@gmail.com.**

What the Future Holds for Female Engineers

It's no secret that women are discriminated against in male-dominated fields. I hear my male peers complain that some of their professors are cold and refuse to help them but will warmly assist female students who run into their offices crying.

I also remember reading the blog of a female programmer with many years of experience who was a guest speaker at a tech conference abroad. She was later harassed online to the point where fake nude photos of her were posted online.

These incidents and many others like them make me wonder why there is so much resistance against women in STEM fields, and whether this will continue to affect us in the future.

One thing that I thought about was the family planning issue. In order to raise a family, women sometimes have to take time off. This may be a hassle to companies that have to find temporary replacements and guarantee the position once the woman is ready to return.

However, the Family and Medical Leave Act allows both parents to take off 12 unpaid weeks, so it is not just a woman's issue. You have also probably heard the news that large tech companies like Apple and Facebook are broadening women's family planning options by covering up to $20,000 for egg freezing procedures[1].

These companies already offer coverage for fertility treatment, childcare, and adoption support as part of their aim to attract more women into the technology industry. However, with the recent controversy concerning IBM executives not hiring women because they get "pregnant again and again,"[2] it makes me wonder if this new option will be effective at attracting, or even retaining, women at all.

Earlier this year, a female developer at GitHub quit after [2] years of dealing with harassment by GitHub's leaders, bringing into attention previous allegations of sexual harassment by other female employees.[3] Even after her departure, anonymous posts continued to spring up, calling her a liar and a spreader of vicious rumors, and threatening to rape and kill her. This incident suggests that what will really retain and attract women is a company's solid reputation as one that does not tolerate harassment and provides equal opportunities to both men and women.

Luckily for us, there is hope on the horizon. The fact that this issue has been in the media a lot lately is a sign that discrimination against STEM women is becoming less of an allegation and more of a reality, and that people are pressuring companies to be less tolerant of harassment in the workplace.

If we continue to bring this issue to the attention of fellow peers, discrimination will be less of an issue for us when we are ready to enter the workforce.

-Liz Dominguez, EE Junior

[1] Sydell, Laura. "Silicon Valley Companies Add New Benefit For Women: Egg-Freezing." Http://www.npr.org/. 17 Nov. 2014. Web. <http://www.npr.org/blogs/alltechconsidered/2014/10/17/356765423/silicon-valley-companies-add-new-benefit-for-women-egg-freezing>.

[2] Williams, Lauren C. "Woman Says She Overheard IBM Execs Say They Won't Hire Women Because They Get 'Pregnant Again And Again'."Http://thinkprogress.org/. Lauren C. Williams, 14 July 2014. Web. <http://thinkprogress.org/economy/2014/07/24/3463621/ibm-employees-wont-hire-women/>

[3] Shontel, Alyson. "A Beloved Silicon Valley Startup Is Under Fire For The Way A Female Employee Was Treated — The GitHub Fiasco, Explained." (n.d.): n. pag. Http://www.businessinsider.com/. 21 Apr. 2014. Web. <http://www.businessinsider.com/github-harassment-story-2014-4>.

Life After Career Showcase

As I reflect on my time spent at Career Showcase, I realize that it has already been a month and a half since the chaos ended. Even after the embarrassing interviews and the hours spent applying online, I would not change a thing about those crazy weeks.

When I first walked into the O'Connell Center, I had no idea what awaited me. However, that moment has turned out to be one of the most important of my life. In the following weeks, I gained in depth knowledge of companies I had never heard of, I was flown out to Dallas at no expense, and I got employment offers from great companies.

The dust of October has settled, and I have now started my first internship. I have learned that companies are not emotionless monoliths. Instead, they are goal-oriented communities, and, given the right people, they can become a very positive force. Successful companies foster healthy office culture because it helps everyone involved.

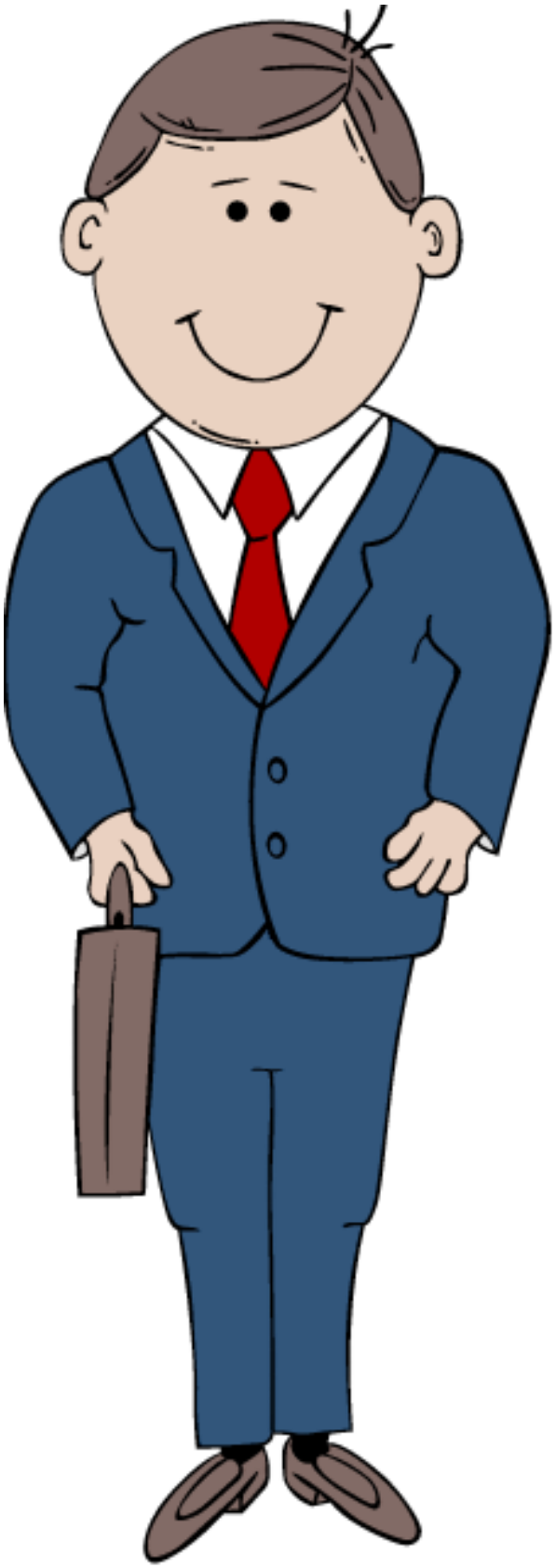
When I walk into work, it feels like I am walking into a room full of my friends. This makes it much easier to complete my projects because I am never afraid to ask for help, and this productivity drives the company's growth. It is crucial that we, as students, seek out ethical companies. How valuable can a job be if you dread the thought of it?

I have learned about more than just office life. For one thing, I am profoundly more familiar with Visual Basic 6 than I was a month ago. Yet this ancient programming language is merely the backdrop for my most valuable lessons.

In less than two weeks I have learned how to work with a large and complicated program, and how to work on a team to update software and fix bugs. I had never understood the complexity of modern software, but this position has shown me a lot. It is pretty clear that classes cannot convey what work experience can.

Although I spent most of my free time in October applying for jobs, it was certainly time well spent. This opportunity has changed the way I view my major, and it gives my studies more direction. I have gained a new perspective on life, and I have met some great people along the way. So as I buckle down for finals this month, I am going to remember that the greatest lessons are not taught in a classroom.

-Daniel Holloway, CE Sophomore



Lab of the Month: The Lightning Lab

The University of Florida Electrical and Computer Engineering Department is home to the Lightning Research Laboratory, one of the premier lighting research facilities in the world.

Founded by Professor Martin Uman in 1971, the lab is made up of three facilities: The International Center for Lighting Research and Testing (ICLRT) at Camp Blanding, the Lighting Observatory in Gainesville (LOG), and the Lightning Research Laboratory. During the stormy Florida summers, the Lightning Lab triggers approximately 30 lightning flashes to investigate this natural phenomenon at close range.

The ICLRT is located in Starke, Florida, just north-east of UF. Here, researchers study naturally occurring lightning, as well as, specially triggered bolts to gain information about the natural processes in the creation of lightning and its effects on power systems and electronics.

A specially designed rocket is shot into the thunder clouds connected to a Kevlar-reinforced copper wire. The wire triggers a lightning strike at about 300 meters and connects the strike to a designated point on the ground. Researchers from over 15 countries have performed experiments studying atmospheric electricity, lightning, and lightning protection.

The LOG is located on the roof of the New Engineering Building and provides an unobstructed 180 degree view of the horizon. In addition, many electric and magnetic antennas, an x-ray detector, and HF and VHF systems have been installed on the roof of NEB. The Lightning Research Laboratory on the fifth floor of NEB provides a location for data analysis.

For the past few years the Defense Advanced Research Projects Agency (DARPA) has funded the research of the lab. Run jointly with Florida Institute of Technology, the Lightning Research Lab aims to solve the "Ten Most Important Lighting Questions" (see sidebar).

For more information about the lab and a complete list of the journal entries regarding the Top Ten Questions in Lighting, visit: www.lightning.ece.ufl.edu. Students interested in working for the lab can contact Dr. Martin Uman, Dr. Vladimir Rakov, or Dr. Robert Moore.

-Christina Sileo, EE Sophomore

10 Important Lightning Questions

1. By what physical mechanisms is lightning initiated in the thundercloud? What is the dominant mechanism? What is the maximum cloud electric field magnitude? What, if any, high energy processes are involved in lightning initiation and how? What is the role, if any, of various forms of ice and water in lightning initiation?
2. What physical mechanisms govern the propagation of the different types of lightning leaders? Can subsequent positive leaders develop in previously-formed positive first-stroke channels?
3. What is the physical mechanism of leader attachment to elevated objects on the ground? What are the characteristics of upward connecting leaders?
4. What is the physics of compact intra-cloud discharges (CID's) (that produce a narrow bipolar wideband electric field pulse, apparently multiple-reflecting propagating waves within 1 km height, and copious HF and VHF radiation)?
5. By what physical mechanisms do lightning leaders emit x-rays? Do the x-rays play a role in lightning propagation? By what mechanism do thunderclouds generate internal x-rays? Do x-rays and other high energy radiation play a role in cloud electrification and lightning initiation?
6. By what physical mechanisms are terrestrial gamma-ray flashes (TGF's) produced? Do TGF's pose a hazard to individuals in aircraft?
7. How do cloud-to-ground and intra-cloud lightning affect the upper atmosphere and ionosphere? What is the energy input into the ionosphere/magnetosphere from lightning?
8. How exactly does rocket-and-wire triggering of lightning work? Are there other possible and practical triggering techniques such as laser triggering? Can triggering reduce or eliminate the local occurrence of natural lightning?
9. What are the power and energy of the component processes of lightning flashes and how are they distributed among electromagnetic processes (DC to light), thermal processes, mechanical (acoustic) processes, and relativistic (high energy) processes (runaway electrons, runaway positrons, x-ray, and gamma rays)?
10. What is the physics of ball lightning? Is there more than one type of ball lightning?

Sustainable Transportation Fair

On November 5, the Office of Sustainability held the Sustainable Transportation Fair, which I was lucky enough to participate in. I spent my afternoon tabling at the Solar Gators booth and learning about alternative forms of transportation. There was a diverse group of organizations, from the UF skateboard club to Tesla Motors.

At the Sustainable UF table, everyone signed a pledge to bike more, use public transportation, etc. After I signed, I got a free t shirt and took a picture in the "one less car" frame. Then I wandered over to the PedBike tent and got sized for my own bike helmet.

It wasn't just about the cool stuff I got, I also learned about living more eco-friendly and sustainably. We, as a community, don't do enough to reduce waste and use less fossil fuels, but Sustainable UF is raising awareness about ways to be greener. Anyone can do small things like taking the bus or biking to class, recycling, or even driving an electric car.

Speaking of electric cars, Tesla Motors showcased two of their sleek electric vehicles. The entire underbelly of their car is batteries and the dashboard is a huge tablet display. It gets 208 miles per charge and can go from 0-60 mph in 5.9 sec. With these amazing cars you save gas and the environment!

In the same vein, Solar Gators, displayed their solar powered vehicle, a student designed, manufactured, and built solar car. They hope to compete against other schools (like Michigan and MIT) this summer in the American Solar Challenge. The car may not be finished yet, but it is a good example of the direction that power is moving towards.

Overall, this event was very fun and really opened my eyes to the ways that I could be more eco-friendly every day. If you're interested in sustainable solar technology, join Solar Gators!

For more information about Solar Gators, visit: http://www.solargators.org/

-Elise DuTreil, ME Sophomore