IEEE Newsletter

Experience the ECE Life

In This Issue...

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.**
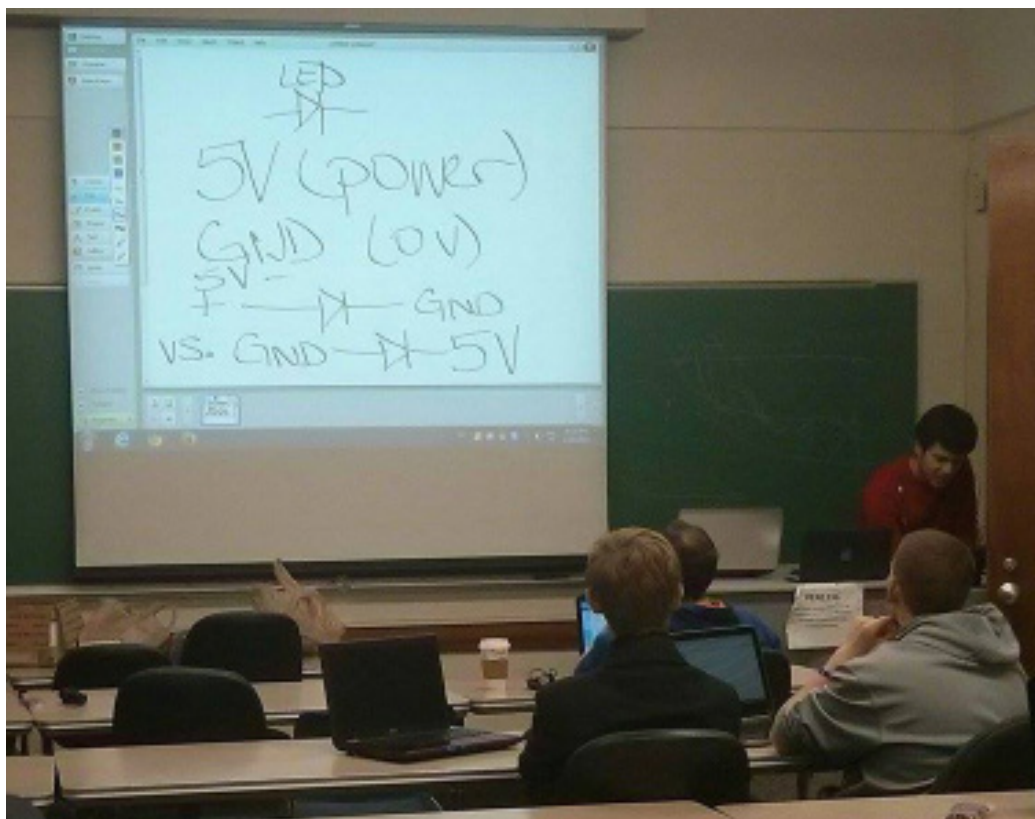
Chris Cruise lectures about LEDs and binary numbers. He taught how to wire an LED and the importance of binary numbers in Electrical and Computer Engineering.

Picking a college major and sticking with it may be difficult as a budding freshman or sophomore undergraduate. One goes through what seems like an endless list of prerequisites and general education courses that one may not even take a course applying to the principles of their major until late into their second or even third year of college.

This is especially important to engineering majors when their early coursework is filled with the challenging sequences of calculus, physics, chemistry, and biology. Too many drop the field of study and move to majors that appear less daunting without even experiencing what the field has to offer.

Luckily, for those looking to study in the ECE fields, Gator Robotics has revived a series of workshops, called Out of the Box Workshops, aimed towards early electrical or computer engineering students that allow a beginner-friendly, hands-on approach to what their major will offer later into their course work.

Founded by UF graduate, Tim Martin, Out of the Box hosted its first series of workshops in the fall semester of 2013. Here, students of all backgrounds experienced how to "hack" the LED of a jack-o-lantern toy to blink at different

Workshops for ECE beginners

**Beginner Workshops
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frequencies, how to spin a motor at a different RPM and in a different direction, and how to wire a breadboard. Now, the workshop is continued by Chris Cruise for the Spring of 2015 semester.

It is even more beginner friendly as the very basics of programming is taught and any code that is already provided is heavily commented to allow the user to learn what each function of the code does and why it is necessary for the successful completion of the workshop.

The first workshop of this semester occurred on Wednesday, January 21. Future workshops will continue every subsequent Wednesday from 6:00pm to 8:00pm until further notice. For more information, join the Facebook group "Gator Robotics" or "GR/Out of the Box Workshops 2015" as all workshop manuals, instructions, and notices are uploaded to these groups.

These courses are also a good refresher for anyone looking to polish their coding and circuitry skills, and for those who do not have the hardware to practice, as all materials are provided courtesy of Out of the Box.

So, if you are unsure whether or not the ECE path is right for you, or if you are unsure whether to bunker up and ride through the never ending storm of the science and math courses required to experience the life of an engineer, attend a workshop. Take a dip into what the future might hold for you. It may bring inspiration as to why you should follow the electrical/computer path.

-Emily Macon, CE Sophomore

Career Showcase Time: Market Your Skills

Career Showcase this semester will be taking place on February 3rd and 4th from 9 a.m. until 3 p.m. at the O'Connell Center.

If this is your first time attending the Career Showcase, here are the basics:

Career Showcase is the place where you get to interact with potential companies that would like to hire you, and you would like to intern or work for. Take a couple of resumes with you, dress business attire, sell your personality and skills. Luckily you will empathize with a recruiter who will call you back and hire you.

If you have been to Career Showcase, this is your time to shine. Go and get your dream job or internship!

On February 3rd is Non-Technical Day – Students in majors such as Accounting, Communications, Education, Sales and Retails attend this day.

On February 4th is Technical Day – Students in majors such as Computer Science, Engineering, Information Systems attend this day.

For more information and tips on Register Employers, Workshops, Information Sessions, Post-Showcase Interviews, What to Wear, Showcase Checklist, or Getting involved with Showcase, please visit: http://www.crc.ufl.edu/students/StudentCareerShowcase.html

ECE Professor Series: Dr. Aysegul Gunduz

Dr. Aysegul Gunduz is one of our newest faculty. While she has her degrees in electrical engineering, Dr. Gunduz is in the Biomedical Engineering Department. Dr. Gunduz was born and raised in Ankara, Turkey along with her sister. While her sister pursued training in classical ballet, Dr. Gunduz decided to be an engineer. At Middle East Technical University, located in Ankara, Turkey, Dr. Gunduz focused on signal processing. After receiving her bachelor's degree in electrical engineering, she came to the United States.

In the United States Dr. Gunduz chose to pursue her master's degree at North Caroline State University in Raleigh, North Carolina. While at Raleigh, Dr. Gunduz did research on image processing and compression. Her Master's thesis, "Compression and Transmission of Facial Images Over Very Narrowband Wireless Channels" sought to decrease the time it took for law enforcement officers to access mug shots.

You may wonder, how does one go from image processing and compression to biomedical engineering? It is a surprisingly small step, biomedical engineering requires a lot of signal processing. What is image processing and compression but signal processing?

After completing her master's in 2003, Dr. Gunduz came to UF to pursue her doctorate under Dr. Jose Principe. She spent her time here researching brain machine interfacing in humans. In her dissertation, "Human Motor Control Through Electrocorticographic Brain Machine Interfaces", Dr. Gunduz developed new paradigms to analyze electrocorticogram recordings to develop prosthetic devices that are controlled by brain activity.

Electrocorticography is the placement of electrodes directly on the surface brain (not in the brain) to record activity from the cerebral cortex. It was long thought that information reliable enough to build brain machine interfaces could only be extracted from invasive single neuron recordings in the brain. Dr. Gunduz's work proved otherwise. She graduated in 2008.

Dr. Gunduz was not ready to settle down yet, her last stop before becoming a professor at UF was to complete her Postdoctoral Fellowship at Albany Medical College in Albany, New York. Her research focused on receiving and processing the data from electrode nets embedded just under the skull for patients about to receive surgery. This surgery was a last resort option for patients with seizures to become surgery free.

The patients would have the electrode nets embedded a month before the surgery. The surgery would then be targeted towards the areas localized with the electrodes.

After completing her fellowship in 2011, Dr. Gunduz accepted a position here, at UF, where she is the Director of the Brain Mapping Laboratory. She continues her dissertation research with electrocorticographic (ECoG) signals and is now correlating the signals to behavior and neurological disorders.

The signals are collected via subdural electrodes placed on the surface of the cortex. For one of her projects she works with several Tourette's patients who have also receive electrodes implants deep in the brain, in the centromedian complex of the thalamus. The electrodes are part of a implantable pulse generator that are capable of stimulating the brain, as well as recording neural activity.

The implantation surgeries take about 13 hours during which the patient is kept awake, and Dr. Gunduz's team records data to verify correct placement of the electrodes. After the implantation, brain signals are extracted through telemetry once a month to track the progression of the deep brain stimulation therapy.

As one can imagine, these electrodes are subject to a lot of noise. Dr. Gunduz's team works on extracting valuable data that can teach us more about Tourette's Syndrome and developing improved and tailored treatment options for these patients. In discussing her work, Dr. Gunduz displays an incredible amount of enthusiasm, this is certainly her passion.

-Matthew Greissler, EE Junior

Recently I attended a WECE event where first and second graders would be introduced to engineering. My task was to think of a game that only used the arrow keys in my laptop's keyboard. Then my computer would be connected to a board through a USB cable. The board would use alligator clips and a conducting mass to extend the arrow keys of my laptop and offer a ground to complete the circuit. While I thought about what games used only the arrow keys I remember, Tetris! I asked if the kids would be able to figure out how to play it and the person in charge said yes. Although most kids did not figure out how not to keep gaps from happening, all of the chaperones remembered the game and even said they used to spend several hours playing the game back in its glory days. If you have never heard of Tetris or would like to know more about it keep reading.

What is Tetris?

Tetris is an intellect game that is considered the beginning of addictive games.

How Do You Play?

Using shapes made of cubes, Tetris allows you to rotate, move left and right, or drop the shapes faster as they fall from the top of the screen. The goals is to not leave gaps between shapes in order for the rows to clear. If they shapes pile up and touch the top of the screen, you lose.

Who Created Tetris?

In 1984, Alexey Pajitnov was diligently programming computer games that tested the capabilities of new equipment developed by the USSR. In his spare time, he drew inspiration from his favorite puzzle board game, Pentominos - a game in which you create a geometric figure by joining five equal squares edge to edge - and decided to create a computer game for himself. Pajitnov envisioned an electronic game that let players arrange puzzle pieces in real time as they fell from the top of the playing field. The resulting design was a game that used seven distinctive geometric playing pieces, each made up of four squares. Pajitnov called this game "Tetris," a combination of "tetra" (the Greek word meaning "four") and "tennis" (his favorite sport).

What is The Tetris Effect?

The Tetris® Effect is a catchy term that players use to describe the way they are inspired by the game and see Tetriminos in everyday situations. Because Tetris, like the real world, challenges players to make order out of chaos using a specific organization system, the game components translate easily into lifestyle interpretations. Whether you're packing the trunk of your car, loading a dishwasher, or organizing your shelves, you're likely thinking about how each object will fit together strategically with minimal empty space. This is the Tetris Effect!

For more information about Tetris or giving Tetris a try visit: http://tetris.com/

-Valentina Rendon, CE Junior
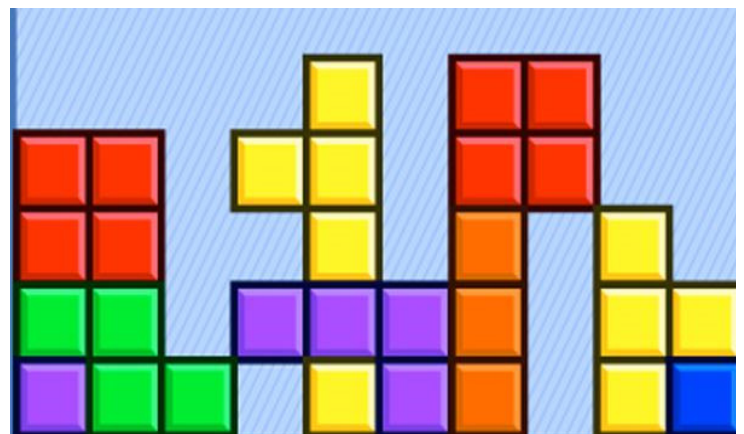
New Semester, Old Habits

It is that time of the year again. We have new classes, different routines, and great ambitions. But what will make this semester better? I think the answer lies in our habits. We spend hours on the Internet every day for nothing more than cheap amusement.

Instead, we should focus on the people in our lives and try to better ourselves. In short, it is time for all of us to cut out the distractions and live life.

When I sit down to crank out a lab or crunch some numbers, I almost always have the Internet a click away. This accessibility is dangerously convenient, often stealing swathes of time from my day. They say that time enjoyed is not time wasted, but I wonder where to draw the line between enjoyment and distraction.

I think that we owe it to ourselves to find this distinction and decide what we actually enjoy doing. If scrolling through pages of links truly makes you happy, then you should keep on browsing.

However, I think most of us use the web like a procrastination playground. This problem encompasses more than shallow entertainment; this tendency towards self-distraction detracts from our lives as a whole.

Not only do these unengaging forms of entertainment steal our time, but they also threaten our well-being. Instead of getting that extra hour of sleep or some extra time with friends, we lose it to the digital abyss.

We should seek out meaningful experiences rather than sitting in front of a screen for hours. A growing body of research suggests a correlation between sedentary lifestyles and an "increased risk of diabetes, cardiovascular disease, and cardiovascular and all-cause mortality."[1]

These findings make our country's Internet addiction that much more menacing. We need to take control of our attention and use it in ways that make us happier and healthier.

Although it is easy to decide to live life more effectively, it is far more challenging to actually do so. We all know how hard it is to turn off Netflix or ignore an unexplored link, but I think it is worth it.

Taking charge of your life is empowering, and it will bring you more opportunities. We should never expect to be perfect, but I think we can all be better. Here is to a more meaningful, less distracted semester.

-Daniel Holloway, CE Sophomore

[1] Edwardson, C., E. Wilmot, T. Yates, J. Henson, T. Gorely, M. Davies, K. Khunti, M. Nimmo, and S. Biddle. "Sedentary Time, Breaks in Sedentary Time, Moderate-to-vigorous Physical Activity and Metabolic Risk in Young Adults at High Risk." Journal of Science and Medicine in Sport 15 (2012): S162-163. Web.

Gator Gymnastics Excites Fans

Florida Gators gymnast Alex McMurtry scores a perfect 10 on the vault against the Auburn Tigers at the Stephen C. O'Connell Center on Friday, Jan. 16, 2015 in Gainesville, Fla. Florida defeated Auburn. (photo from the Gainesville Sun)

It's spring semester so that means that baseball, basketball, track, and gymnastics are back. I had the pleasure of attending the January 16th gymnastics meet against Auburn.

It was nice to take a break from my mountain of engineering homework to relax and enjoy a sports event - especially in a sport that the gators dominate! The UF gymnastics squad won with a score of 197.200 to 195.650, despite one of their top performers, Bridget Sloan, sitting out with a sprained ankle.

Other team members got to shine, like freshman Alex McMurtry. The crowd went wild as she flipped through the air on a perfect vault and managed to score a perfect 10!

Although there was a fall on the beam, the gators made a comeback in the floor routines, in which every gymnast incorporated a signature gator chomp into their routine.

It was so exciting to watch as the athletes flipped and twisted in gravity-defying tumbles to upbeat music. Engineers could also appreciate the physics behind gymnastics. The vault, for example, requires torque in order for the gymnast to rotate. To achieve this the gymnast needs immense acceleration down the runway and the correct application of force on the vault table.

It's amazing to see, and I highly recommend that everyone goes out to a gymnastics meet to support our team and see their incredible athletic skills!

For more information about UF Gymnastics events visit: http://www.gatorzone.com/schedule.php?sport=gymna

-Elise DuTreil, ME Sophomore