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Welcome from the ECE Chair

I have been chair of the Electrical and Computer Engineering Department since 2011 and, throughout this time, IEEE has been the most active student group in the college. I am very much appreciative of the IEEE students and all the work they have done for the students and the department.

Overall, it has been a great year for the department. We continued the rapid growth of our faculty numbers. Since 2014, we increased our tenure-track numbers from 41 to 49, including our University President Kent Fuchs. This is the highest number of tenured/tenure-track faculty members ever in our department.

We are also more diverse than ever with six women and two African Americans among our faculty. With these new hires, we have been able to shore up key areas in the department such as cybersecurity, power systems, neuroengineering, and machine learning. For the fiscal year that has just ended, we had record high research expenditures, totaling almost \$17M.

This is our all-time high and the largest of any department in the college. It has also been a great year of fund raising for the department and the college. We received over \$2.5M, highlighted by Sachio Semmoto's \$1.5M gift for an Endowed Professorship in the Internet of Things. This past year, Herbert Wertheim gave a landmark \$50M



gift that has placed his name on the college; it is now called the Herbert Wertheim College of Engineering.

This year concludes my first five-year term as department chair. With the support of the ECE faculty and staff, Dean Cammy Abernathy has asked me to serve a second five-year term that concludes in 2021. I am honored to continue to lead the department

and proud to serve under the strong leadership of our dean and our president.

We are currently revising our department strategic plan. Our list of goals for 2021 includes:

- Grow our faculty numbers to 60 including more diversity and more endowed chairs and professorships.
- Increase our research expenditures to \$28M
- Move CISE and ECE into a brand new IT building
- Grow undergrad EE enrollment from 500 to 1000.
- Continue to innovate in the classroom with the flipped classroom, personalized learning, and online course offerings.
- Move into top 10 ranked public ECE departments (Currently #19 on USN&WR)

Thank you for your generous support of ECE. You are helping us build a brighter future for our department. And, as always, Go Gators!

--John Harris, Professor and ECE Chair

A Tribute to Professor Haniph Latchman

This semester marks the time that the Electrical and Computer engineering department will say goodbye to Dr. Haniph Latchman who is taking an early retirement after 30 years of service to the students and faculty at UF.

Born in a St. Cathering in the Island of Jamaica, Latchman completed elementary and primary schools and received a scholarship to the University of West Indies in Trinidad and Tobago, graduating with 1st Class Honors in Electrical Engineering. He then worked for several years at the Jamaica Telephone Company, working with fiber optics and microwave communications.

After receiving the Rhodes Scholarship for Jamaica – an honor that only one scholar per year can receive – Latchman continued his education at Oxford University. In three years (from 1983 to 1986) he was able to complete his doctoral work in Systems and Control, after which he joined the Electrical Engineering Faculty at the University of Florida.

Latchman’s research interests at UF included the Analysis and Design of Multivariable Systems with Uncertainties, Robust Control Systems, Powerline Communication systems and Networks, and the Scholarship of Teaching and



Learning with applications to Engineering Education.

During his tenure at UF he has directed 25 PhD candidates and 33 Masters theses and published around 180 papers and several books. At UF Latchman has been able to explore both his research interests as well as his passion for teaching.

“I always enjoyed teaching, even when I was in Jamaica in high school,” Latchman said. “Local students, family members and community kids would come to my house for mathematics help. I had a little classroom in my car port.”

Latchman has taken his lifelong passion for teaching and transformed the college experience by focusing on teaching through

the use of asynchronous learning networks in which students can discuss the class and ask questions in more of a social media and chat room scenario.

This philosophy of teaching topics thoroughly through technology in this collaborative way earned him the 2000 IEEE Undergraduate Teaching Award for ‘Innovative and Inspirational Teaching and Advanced Use of Technology in Education’.

Interestingly, Dr.Latchman has also won almost every conceivable teaching award at the University of Florida the College of Engineering Teacher of the Year (1990 and 1998), the UF Teaching Improvement Project Award (1993 and 1998) and the University of Florida Teacher of the Year (1998). He is also a life member of the University of Florida Distinguished Teaching Scholars.

“There is a fundamental difference between teaching and lecturing.” Latchman said. “And in general in lectures, students don’t

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A Closer Look: James “The Man” Cardaman

An interview with a third year engineering student over Chipotle

Latchman Tribute
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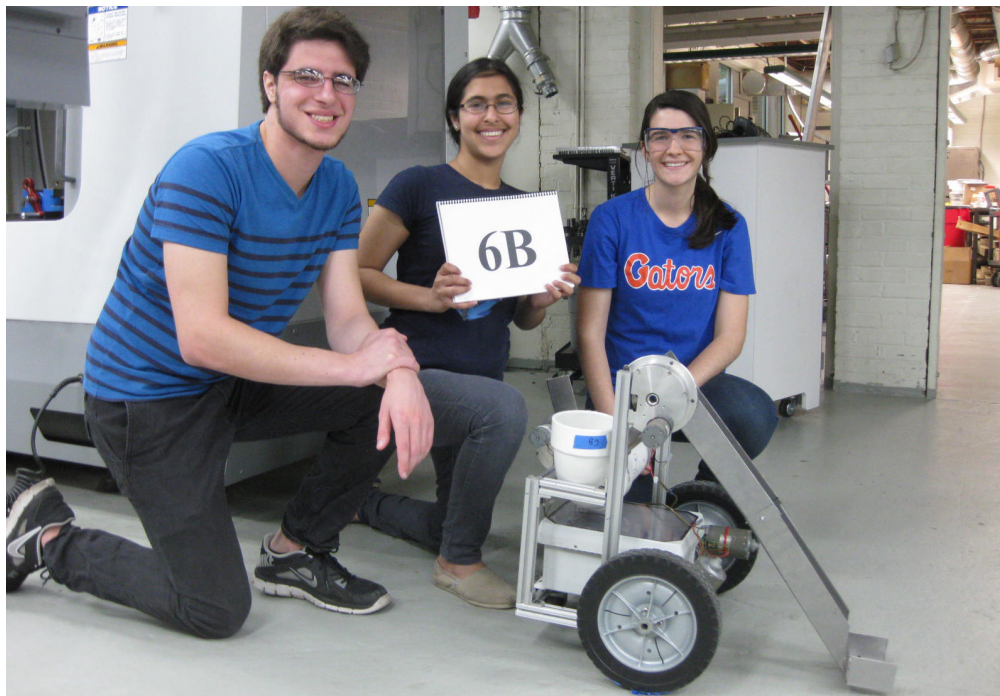
learn very effectively. In contrast, the very notion of teaching implies learning, because teaching is defined as helping someone to learn”.

In the future, Latchman intends to continue to maintain some relationship with UF, continuing his work with technology in education through the online programs, further trying to mimic the effectiveness of the interactive face-to-face learning experience.

He also plans to help his home country of Jamaica with their ongoing development of a fledgling Engineering program focusing on his subject matter expertise and his teaching philosophy. Until then he leaves students with these words of wisdom:

“Students – young people in general– have the opportunity to form a philosophy of living that is not driven by purely material goals such as making money and having large cars and bank accounts. And do strive to Learn effectively, deeply, not just to pass exams, but to actually know the material in order to be able innovate.”

-- **Christina Sileo,**
EE Senior



James Cardaman (left) poses with a robot designed to collect racket balls and deposit them into a goal.

Interview conducted by Ryan Childress

RYAN: Good morning James, thank you for taking the time to answer a few questions about your experiences.

JAMES: No problem, I always have time for you, Ryan.

RYAN: Thanks, I appreciate that. So, can you tell me about your history with Lockheed Martin?

JAMES: Of course. To start, last summer was my 4th summer, so next year will be my 5th. Working there for so many years has given me a very diverse experience. I was able to do work in both electrical and mechanical engineering, which was very influential in determining my major.

RYAN: Last summer was your fourth consecutive summer, but this is only your third year at UF. Can you explain?

JAMES: The way that I actually got this internship was through a program in high school. I went to a high school that had a math, science,

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Student Interview

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and engineering magnet and there was an alum who went on to work at Lockheed Martin and founded the internship program. A board of interviewers extensively reviewed the resume of every student in the magnet before performing interviews and eventually choosing the two best candidates for the internship. If the intern performs well, they will get invited back each summer and eventually receive a job offer.

RYAN: Can you give me an example of something major you have worked on at your internship?

JAMES: During my third summer, I was a part of a team that worked on the weight and trim of a vehicle. I had to determine a setup that adjusted the center of gravity and weight of a vehicle so that it didn't rotate, sink, or float.

RYAN: How have you learned from your experiences and applied them to your education?

JAMES: I had difficulty in previous years working in teams because it's very difficult to get everybody to do their part and work together. I learned a lot

about how to take control of a team situation and motivate everybody to contribute thanks to my experiences at Lockheed.

RYAN: How have you taken your educational experiences and applied them at Lockheed Martin?

JAMES: I would say that the classes I've taken at UF have given me the base knowledge necessary to work at Lockheed. For every task that I had at work, I would need to make use of things that I learned in a variety of classes, but I would also need to make use of my coworkers and additional industry learning material in order to build on my knowledge and effectively complete my tasks.

RYAN: Wow, that's very interesting. So, that's all I had planned, but before I go, do you have any additional advice for the University of Florida Engineering undergrads?

JAMES: Don't give up on something just because you don't think you have a shot at getting it. There were half a dozen people who were expected to get the Lockheed internship over me, but I gave it my all and it paid off.

RYAN: Thank you, James. I will definitely take that one to heart.



career opportunities

It's Fall once again, and that means it's time to start hunting for a summer job or internship! It can be stressful to keep up with class work and social life all while attempting to impress recruiters.

It's a tough juggling act that all engineers must balance, but one group that makes it easier is the Society of Women Engineers (SWE). They have great free food (not just pizza), fun events, and career development all in one group.

The night before career fair, SWE hosted a mini career fair called

Evening with Industry, which is an easy way to meet potential employers before the ridiculously large crowds at showcase.

At the event, I was able to connect with recruiters from Pepsi, P&G, GE, the Navy, Cummins, and more. It was a great way to meet them in a less formal setting before showcase. For example, I was able to talk to a manufacturing engineer from Pepsi about his experiences which helped me get an interview later on.

SWE's Evening with Industry allows companies to actively seek female engineers and gives female engineers the opportunity

to connect with companies they might not have known about before. The event is also open to all engineers, although SWE members are given preference the first half an hour.

As a four-year SWE member, I always look forward to Evening with Industry because it allows me to gain a personal connection with companies looking for female engineers.

So come and join SWE for its upcoming engineering events! For details visit <http://sweufonline.weebly.com/>

--Elise DuTreil, ME Senior

Tips for Success in ECE

It can be quite overwhelming to be a new engineering student here at the University of Florida. It can be difficult to adjust to all of the new challenges that you will inevitably encounter as an undergraduate electrical and computer engineering student. As such, I have put together some general tips for success. What I learned during nearly 6 years as a student here will hopefully prove useful.

--Daniel Kelly, UF IEEE President

Manage Your Time Wisely In electrical engineering, lab or project-intensive courses such as digital logic and microprocessor applications require that you start working on the project assignments EARLY. My personal recommendation would be to start on the project as soon as you know the requirements and do a little each day. Make extensive use of time management and to-do list tools as well, such as Google Calendar or QuickMemo, so that you can prioritize tasks. However long you think a task will take you, plan for double that amount of time.

Get to Know Your Professors If you show genuine interest in learning the material, professors in ECE will be more than happy to help you out with any questions or concerns you may have. Visit their office hours whenever you need to. If a professor is looking for a student assistant to TA one of their courses or work in their research lab, they generally look for students who they know and who have done well in their class.

Choose Courses that Interest You You may be tempted to take the courses that are easier than others in the hopes of getting an easy degree. This will hurt you in the long run. Take courses that you are interested in. You will learn better this way, and you will also remain interested in your studies.

Learn to Debug and Troubleshoot This tip is also extremely important. Learning proper debug techniques is essential. Know what the output of your system should be. From here, trace deeper into the project along the problem's path until you find where it breaks. It is also important to learn how to use laboratory equipment such as multimeters, oscilloscopes, function generators, and logic state analyzers. Students have landed great internships in their college careers based on these skills alone.

Get Involved in Student Organizations

This is one of the most important points of advice I can offer. Student organizations present great opportunities to network with upper-level students and also present opportunities to strengthen your technical and soft skills. Check out the information sessions and workshops hosted by IEEE, WECE, ACE, and AES (among others). There really is no downside to being a part of these great organizations.

Always ask "Why?" It is extremely important to understand that as engineers, we are not machines who memorize formulas or laws. We are problem solvers, and there will be many times in your career where you will be presented with problems that cannot be solved the same exact way. Thus, it is important to gain a deep understanding of all that you study. Ask why certain concepts exist, and research outside of class to obtain deeper knowledge. Once you know the fundamentals of a concept, they can be extrapolated to solve any related problem.



UF IEEE President Daniel Kelly and Secretary Ammar Nek pose with Albert and Alberta. Getting involved in a student organization gives you plenty of opportunity to meet new people and develop your technical skills.

For the love of Tango

Google releases Android app

From pipe dream to reality, revolutionary navigation and augmented reality technology will be in the hands of the average consumer sooner than most realize. Tango, formerly known as Project Tango, is Google's little known yet extremely exciting initiative into the world of augmented reality. However, this is not the same augmented reality which involves headsets or glasses.

Instead, the everyday mobile phone will contain additional sensors to give the device an accurate depth perception as well as keep track of precise translational movements of the system. Developers have already begun making unbelievably fun and useful apps for such devices. These applications range from useful tools such as a 3-Dimensional tape measurer or vision assistance for those with disabilities to fun games like a domino or virtual pet simulator.



What makes it possible

Tango developers make use of either infrared projectors or stereovision (the reason humans have depth perception). The Tango development kit includes an infrared sensor which can read the depth of 30,000 points within its field of view simultaneously. Such detail is sufficient for mapping out most 3D environments.

What makes it stand out

Compared to the Microsoft hololens, Tango will be more universal and easily accessible to the general public. While the hololens is speculated to cost several thousand dollars according to itpro.co.uk, Tango sensors will be gradually incorporated into next generation smart-phones, the first of which being the Lenovo Phab 2.

How it can be used

The Tango team's end-goal is extremely different than that of any other augmented reality startup. They hope to eventually grow Tango's network to the point where it can be used for internal navigation of large stores, offices, and shopping areas. It will be able to direct consumers directly to the eggs within Walmart. Or, if you happen to be running late for a meeting, it can show you the most optimal route through a building.

Some practical applications of Tango already under development or refinement are discussed below:

3-Dimensional tape measurer: Point at any place on your phone's camera screen to place a point, choose another and it measures the straight-line distance. Now pick a third and your phone will create a 3D box with the real length, width, and height of the chosen area.

Online furniture shopping: Place a virtual chair, carpet, desk, etc. in your room and walk around it. Through your phone screen, you can see exactly what every angle of having that piece of furniture in your house looks like.

Dominoes: Create a virtual domino course in your room in which the dominos can fall off of tables and chairs and continue the simulation realistically onto lower-height platforms.

-- Jonah Kornberg, CISE Freshman

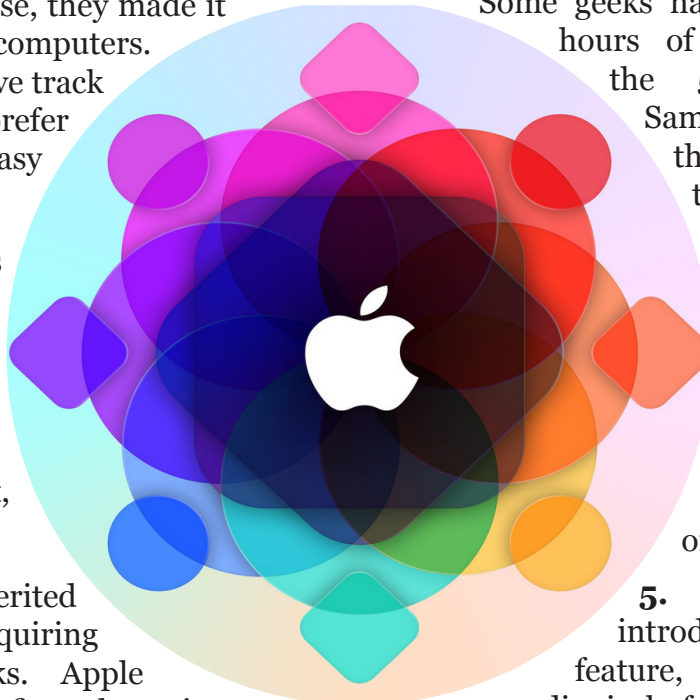
Apple: questioning the status quo

Last month the iPhone 7 was launched. Every Gadget Geek waited for this day to see what's new in Apple's announcement. Every year Apple tries to bring something new to the table. Every year it gets either a Wow! Or a Boo! from the users. But one thing is clear, the Apple always questions the status quo. While they may not be the pioneer of every technology, they are the game changers. Let's talk about few technologies of the past and present to see how Apple likes to question the status quo!

1. Mouse: During the mid-1980s, most people used their computer via a command line. Later, Apple launched Mac with revolutionary GUI and popularized its use with a mouse. Although Apple didn't invent the mouse, they made it a special feature of Apple computers. Even today, when people have track pads in their laptops, many prefer to use a wireless mouse for easy computing.

2. Trackpads: Early '90s notebooks used a bulky trackball as a substitute of mouse but the launch of Apple PowerBook 500 series launched the trackpad as an input device. The rest, as they say, is the history!

3. Multi-Touch: Apple inherited this technology by acquiring the company FingerWorks. Apple launched this feature in its first phone in 2007; at that time big screen phones with a small or sliding keypad were popular in the market. Multi touch has changed the way people used to view pictures or do web browsing. The two finger "pinch" zoom is possible through multi-touch technology. Post launch, many manufacturers adopted the capacitive multi touch rather than using resistive touch.



4. Fingerprint Unlock: Apple launched Touch ID in the iPhone 5S, using a Fingerprint sensor to unlock device and authenticate payments in Apps like iTunes and bank logins. (Fun fact! Some geeks hacked this feature within 24 hours of the phone launch). After the 5S, many OEMs like HTC, Samsung Android Nexus 6P, and the One Plus 3 incorporated this feature. Again, Apple was not the first to launch a phone with a fingerprint sensor. They followed the Motorola's Atrix which uses a finger swipe method. But Apple improved on its predecessors method, which only requires placing fingers on the sensor.

5. Wireless Earbuds: To introduce this latest iPhone 7 feature, Apple removed the 3.5mm audio jack from the phone. Apple faced criticism from users and ridicule by its competitors. Nevertheless, I see this as questioning the status quo, heading toward a future where phones will shrink and space inside the phone will be a premium. The Apple earbuds use Apple's own custom W1 chip and are optimized to deliver the best user experience, while offering longer battery life.

Before Apple's launch, I switched to a famous OEM's wireless earbuds. This offers an enhanced experience of comfort when talking, listening to music on-the-go, and in the workplace, where my hands were free with no wire attached to my phone! I predict that other manufacturers will move towards wireless earbuds, realizing that removing the 3.5mm jack increases room inside the phone; room that can be used to add a new IC for a new feature or increase the battery size to increase its mAH rating. Apple has a clear message to its competitors "Dare to question the status quo"! People (and companies) may resist change, but too few have the capacity and courage to take risks, while others sit silently and watch for the outcomes of someone else's change.

-- Nidish Vashista, EE Grad Student

Powering the Future of the Battery Market

In the dawn of the electric car industry there is becoming a large emphasis on the advancement of battery technology.

Recently, Tesla jumped into the battery market. They are working to complete Gigafactory 1. This factory will be in Nevada, and will produce Lithium-ion batteries. It is the world's second largest building.

Tesla has a projected capacity for this factory is 35 gigawatt-hours per year of cells in addition to 50 gigawatt-hours per year of battery packs. This massive influx of batteries is set to revolutionize the markets for batteries.

One major use for batteries is for stationary storage. Today, stationary storage batteries are typically used as backups. In case the power goes out at a hospital there is a stationary storage battery that will keep the power going until the backup generator kicks in.

As this battery revolution begins many people are beginning to suggest that old electric vehicle batteries could begin it's own market.

Instead of having to pay for a brand new battery these older used batter-

ies could be purchased for a much lower price, and perform just as well.

However, there seems to be a flaw in this prediction. Many of these stationary storage batteries are quite important, and can not be at risk of failing. If a hospital's stationary storage battery fails then people could die. This is a risk that some organizations can't take.

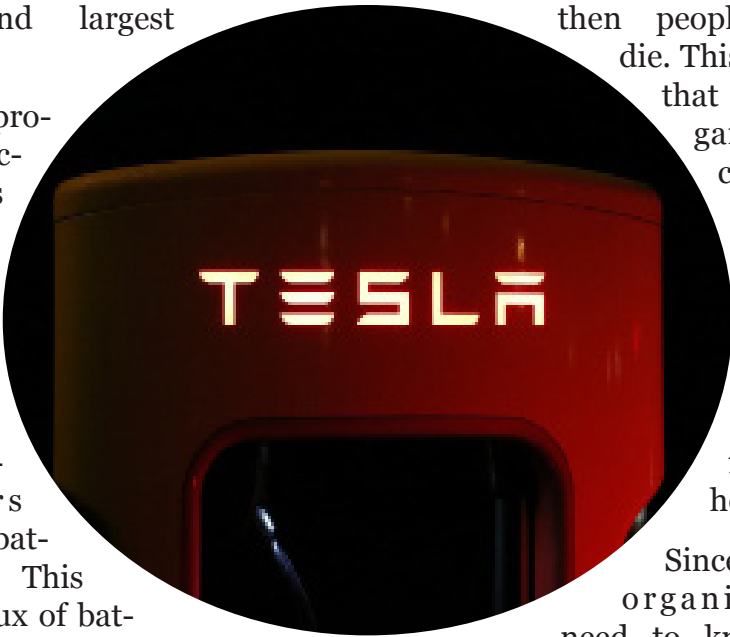
If the battery isn't fit for a car how can it be fit for a hospital?

Since some organizations need to know that these batteries will work the extra couple hundred dollars could be worth the potential loss of either money or lives.

As we come closer to this massive change in the battery market we will need to find new uses for these used batteries. They may not be used by larger organizations they could however be used by future consumers.

So as we look towards the future keep an eye on how to exploit the rise in cheap used batteries.

-- Daniel Kitts, EE Sophomore



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