Department of Engineering & Computer Science
Andrews University

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ECS NEWSLETTER

Inside the Issue

The Engineering and Computer Science Department aspires to be a place of choice for engineering and computer science education where dedicated student and faculty grow together to reach their God-given potential for service to society and the church.

Message from the Chair

Greetings! Our fall semester started with the record high enrollment and the high spirit. It is God's blessing that we thrive as an entity and grow stronger as one big family. We all together build an enduring culture of discipline and caring for one another. We had a heart-breaking semester of losing two precious students by a tragedy. I thank all of us for supporting one another, praying for families, sharing the fondest memories, participating in the memorial services, and contributing to the memorial fund. In all, we will remember our dear friends and students for a very long time. I dare to reaffirm our special culture of care for one another while seeking academic excellence and values in life. We will move forward and continue to be excellent. Students, faculty, staff, parents, alumni, and supporters, thank you for your prayer and support. Blessings to all!

Hyun J. Kwon, Ph. D
Professor & Chair of
Engineering and Computer Science

ECS Department Expansion

With the increase in students in the Engineering and Computer Science Department, more space than just the 3rd floor of Haughey Hall was needed. Although Harrigan Hall houses the Visual Arts and Design Department, the Deans offices for School of Health Sciences and Lithotech, there were a couple of rooms that were unoccupied; thus, Engineering was able to move into those spaces.

The 2016-2017 school year will find the Department of Engineering & Computer Science in two buildings - 3rd floor Haughey Hall will still house Computer Science faculty and classes as well as a few introductory Engineering courses. On the other hand, most of the Engineering faculty and classrooms will be in Harrigan Hall. The bottom of Harrigan Hall will house 4 labs, 2 faculty offices and 2 research offices. The main floor will consist of the rest of the engineering faculty offices and one classroom. Lastly, the top floor will be classes held in the auditorium and one more classroom.

Interestingly, we still need more room. We are looking forward to the STEMplex being funded and built so that Engineering will have an adequate home for all their student's needs.

Departmental Vespers

The ECS department has had a great turnout in vespers get-togethers this last semester! Dr. Kwon, Dr. Boon-Chai, and Dr. Lovhoiden have graciously opened up their homes for praise music, resounding devotionals, excellent food, and all-together wonderful company of engineers, computing majors, and other friends. I have been very pleased to hear from various students who come up to me eager about coming out to the next vespers event, saying they are looking forward to the great times we have on these special Friday nights. Be on the lookout next semester for more vespers events, and be prepared for new ice-breakers and fun group games! If you are wanting to be involved in any way, or if you have any ideas for our time together, make sure to speak to me or Ester Carrasco--we'll be around the department. Can't wait to see you all there in the Spring!

By **Andrew Gagiu**

HVA Engineering Demonstration

Earlier this semester, I had the opportunity to travel to Highland View Academy with my classmate and colleague Jonathan Penrod. Earlier in the semester I invited Jonathan to come on a recruiting trip to Highland View Academy to go their annual STEM festival, where different institutions like NASA and the DEA were there with us.

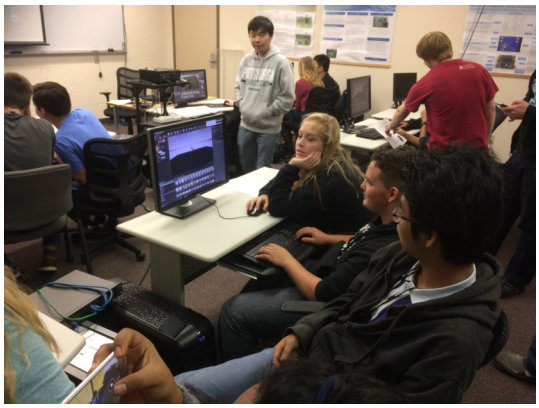
We left Friday at Noon, and we settled into taking our long eight-hour trip to Maryland. Because we stopped for food in Pennsylvania we finally arrived in Maryland at Ten later that night, I dropped Jonathan at the dorm, and I went to my dad's house.

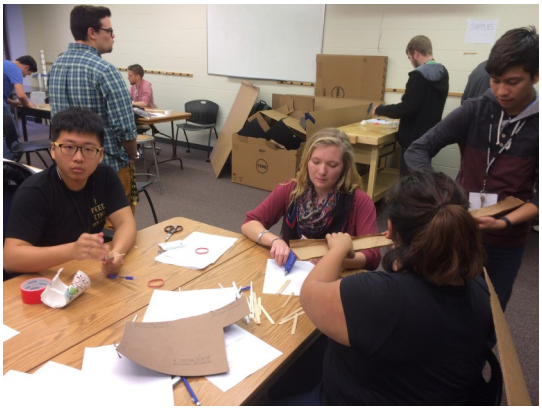
Sunday, the STEM festival began. I brought a robot that I had been programming, and Jonathan brought his RC plane to fly around the gym doing loops and tricks in the air! Where my robot was programmed using ultrasonic sensors to follow objects that were in front of it.

At Five PM we began our excursion back to Andrews, after nine long hours we made it back to Andrews and then got a couple hours of sleep.

By **TC Coleman**

SciFEST

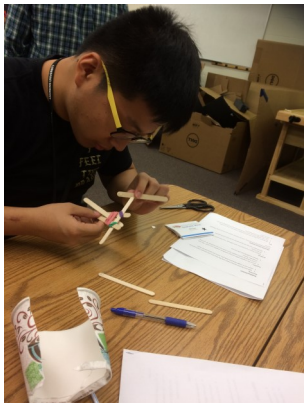




SciFEST this fall brought Adventist academy students to Andrews to explore each of the STEM programs on campus. As part of their experience, they participated in activities in Agriculture, Biology, Chemistry, Computer Science, Engineering, Mathematics and Physics.

In keeping with this year's theme, *Space*, the Computer Science activity had student teams simulate the process of exploring an alien planet with a robotic rover. To create this experience, students designed their planets in the Unreal engine. By building their planet in the engine, they were able to virtually explore their world by piloting a rover over the terrain. This activity introduced students to a professional tool for creating games, simulations and virtual reality applications.

"SciFEST is an awesome hands-on STEM experience that all high schools should plan to attend. It challenges advanced academic achievers and excites them with possibilities for further studies and career opportunities in STEM fields," said Monica Nudd, STEM Enrollment Coordinator.


Society of Women Engineers

Convention: October 26-29, 2016

Attending the Annual SWE Conference in Philadelphia was an amazing experience. This Conference was a great opportunity to learn more about the career fields in engineering, network with many companies, and expose oneself to internship opportunities and even learn more about graduate programs. Never having attended before, I was not sure what to expect. Once we registered we were given a packet of things that included an informative pocket guide. This was very useful throughout the event to find what sessions were being held as well as the time of events. The sessions covered many interesting topics within the following: Advocating for change, Career Management and Life Transitions, Career Enhancement, Women in Academia, Lightning talks and Strategic leadership. There were so many great sessions to choose from. One of my favorite sessions was presented by engineers at Cummins in which they demonstrated what to expect in an interview and key pointers on how to standout within your field of study. The career fair was the highlight of the conference where many companies were setup in booths promoting their company with great giveaways. This was an amazing opportunity to speak with multiple representatives, learn more about the company and personally submit a resume for potential jobs or internships. Going to this event was a growing experience in which has better prepared me for the future and hope that many other women in the department will also share this experience in the conferences to come.

Aspire / Advance / Achieve

By **Ester Carrasco**

Engineering Without Borders

What does this club do? I wondered. It was different from all other clubs: its sole focus was implementing engineering to "meet basic human needs abroad". I signed up for the club and moved on to the next booth, pondering this club's peculiar focus.

Service in engineering. I readily began attending all of the EWB club meetings. Here, I learned that the club's main focus was a power installation project in Ambatolampy Vohitsara, Madagascar. This project fascinated me and as club elections came around I applied and was accepted into the position of project lead on this power project. Fall semester of 2016 found the AU EWB international project team preparing for submitting the application for EWB to approve of our potential Madagascar Project (community application). Through partnering with the International Development Program - which had already traveled to this site and worked there - our team was able to successfully submit the community application and with its acceptance, our Andrews University Chapter is now in the mentor - seeking and trip planning phases.

Indeed, the Andrews University EWB chapter has allowed myself to see how engineering holds relevance not only in creating innovative technology but also and more importantly to glimpse its ability to improve the life of those less fortunate. From boundary value problem solutions in engineering to seeing that engineering really has not boundaries after all, I have come to realize via my EWB involvement that engineering at its heart is about service.

By **Greg Zdor**

Freshman Profile

Jeremy Ahn

1. Where are you from? Where did you go to high school?

I'm from Chicago (specifically Naperville, IL) where I attended Naperville North High School.

2. Why did you choose Andrews University?

I chose Andrews because it was a comparatively smaller University close to home where I could not only pursue a double major in Engineering and Music to expand my academic limits but also feel comfortable in a diverse, Adventist community.

3. What are you majors? Why did you choose them?

My majors include Mechanical Engineering and Music (Piano). I chose engineering because I have come to enjoy the math and sciences as well as their applications, and music because it has forever been one of my greatest passions.

4. What are some blessings & challenges that you came across during your first semester of college?

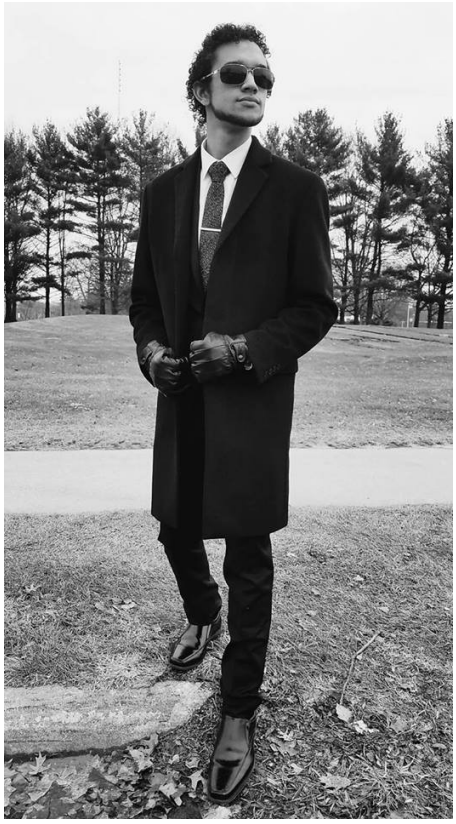
I have received a large number of blessings through the new friends I have made and the support they give me, not only in my fellow student body but also within the teachers of my classes as well. Challenges include a greater amount of responsibility and resulting stress that inherently come with new opportunities.

5. Can you tell us an Interesting/random fact about yourself?

While it is not so much of a consistent hobby, I love to go snowboarding each winter and can ski as well.

Senior Profile

Joshua Marsh



1. What is your major & emphasis?

My major is Computing and my emphasis is Software Systems.

2. Why did you choose this major?

I chose this major because I have been into computers ever since I was 3 years old. Technology has always fascinated me.

3. What are some blessings and challenges that have come with your college career?

The blessings that have come with my college career are countless. I have made several new friends and relationships that I will forever cherish even after I leave this place. I believe that all of the experiences I've faced here--whether good or bad--have made me into a better person and taught me a fair amount of lessons. My main challenges here haven't been vastly different from the average college experience. Time-management and procrastination on homework projects have been the most of my challenges here.

4. Do you have any plans after graduation (jobs, grad school, etc.)?

After I leave here, I plan on working in the software management field of well-known technology company names (Google, Microsoft, or Samsung).

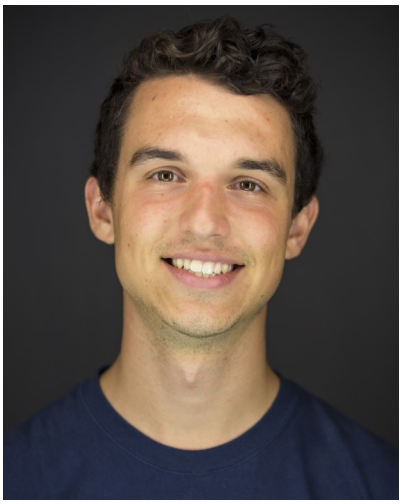
5. If you could go back in time, what would you do differently?

I can't say that I would do much differently if I went back in time. Even the not-so-good days I had were all still part of the journey for me.

6. Finally, any tips for current/incoming students?

As far as tips for incoming students, I would say to study hard, but also play hard. College is a once-in-a-lifetime experience and you should live it up to the fullest.

Internships



Jonathan Penrod

Q: Where did you intern?

A: I interned at Tekna in Kalamazoo, Michigan. Tekna is an engineering and design firm that contracts for all different kinds of companies. They handle medical tool projects, kitchen appliances, futuristic pet grooming tools, branding processes, and so much more. Other companies come to Tekna with ideas that need to be engineered and developed. Tekna quotes a price for the work and the other company decides if they want Tekna to handle the engineering and design. There are new projects coming through on a weekly basis.

Q: What did you do there? What was your day to day life?

A: I spent every single day learning! I learned how to use Solidworks move efficiently, Pro E, 3D printing software, and machining tools. I started out modeling components for prototypes and running tests on different products. In the end I actually got to design a component for a surgical drill, a gasket system for a cooking grill, and I prototyped a linkage system for a retractable wheel system. Probably the most important thing that I began learning is the general principles behind engineering practice. I learned a little bit more about how to lead a product brief, how to handle an efficient brain-storming session, and I even

Q: Did you learn skills that are going to be used in your day to day life after college

A: I learned plenty of professional etiquette and people skills that I will continue to apply. I picked up some fun engineering practice types of things that you will never learn in school, and I learned what it is like to be an active Christian in the work place. I am glad that Tekna is so empowering and balanced regarding such things.

Q: How is Tekna going to be used as stepping stone for you in the future?

A: I will be starting full time at Tekna in May as a Design Engineer. I could not be more excited! I look forward to working with the team again and continuing that learning process. Just the other day I swung by after getting out of classes at Andrews and played some cards with the guys over their lunch break. It is good to know that you have a home in the professional field.

Q: Any parting advice as a senior to coming in freshman and your other peers?

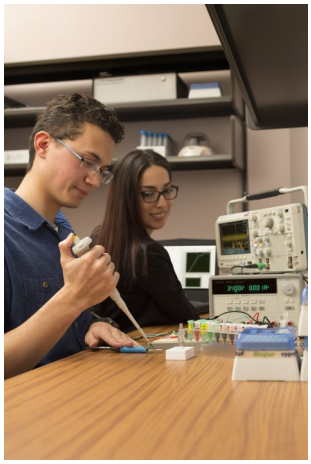
A: Don't give up! Develop a healthy sense of confidence and integrity.

Other students who did an internship:

Taylor Coleman: NAE
Tom Winnard: NIST
Troy Furst: Cook Nuclear Plant
Josh Horn: Enventek
Josh Pazvakawambwa: Enventek
Jonathan Penrod: Tekna
Nathan Verrill: NIST
Eduardo Cunha: AglowPower Electric
Daphne Duvivier: American Express

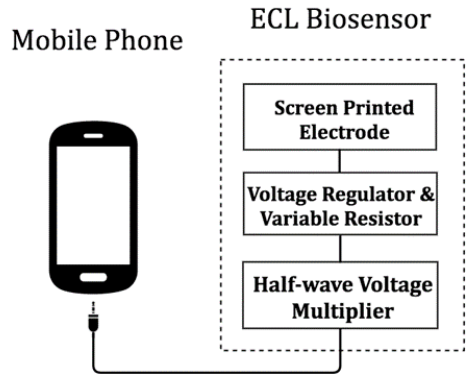
Student Research

Daniel Marsh



Under the supervision of Dr. Hyun Kwon, I am a participant of the R&D of a mobile phone-based biosensor. The biosensor uses electrochemiluminescence (ECL) to measure concentrations of particular complex molecules. Though there are many possible target substances, my research focuses on measuring biomarkers for cancer. The goal of the project is to bring the diagnosis capabilities of ECL technology found in hospitals and medical laboratories closer to end-consumers. The simplification process involves making a device that is portable, affordable, compact, and user-friendly while maintaining the accuracy and reliability of current ECL equipment. These equipments: photomultiplier tube (PMT), computer interface, and potentiostat are replaced with the camera, application interface, and audiojack of the mobile phone, respectively. The audiojack of the mobile phone provides power for both ECL initiation, and the general power needs of the device (e.g. LED indicators).

So far, a circuit has been designed that successfully alters the audiojack signal of the mobile phone to meet the voltage requirements of the biosensor. Calibration of the biosensor has begun using a PMT. A mobile application is being developed to supplement the biosensor in data capture and analysis. Upon the completion of the biosensor, the door is opened for patients to receive diagnosis without going to meet their doctor. The data collected from the mobile phone could be sent to a doctor who would respond with the diagnosis and further recommendations for the patient.

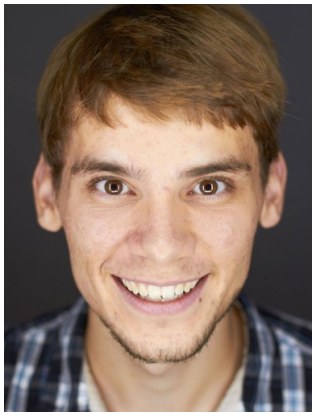


Biosensor Design Concept

Other students who are participating in research:

Ester Carrero & **Jisu Choi** (with Daniel Marsh): *Development and Configuration of Mobile-Phone based ECL Biosensor using $Ru(bpy)_3^{2+}$ and DBAE*
Darrick Horton: *The Einstein Toolkit for Gravitational Wave Research*
Steven Mann-Rojas: *A Deep Learning Approach to Identifying Outcomes*
Nathan Verrill (with Darrick Horton): *Triggering of Substorms*

Alumni Spotlight



If someone had told Jonathan Wheeler during his first year at Andrews University he would be attending Stanford University for graduate school–a school with an acceptance rate of 4.7 percent in 2016–he probably wouldn't have believed them. In fact, Jonathan remarks on the situation, "To call this feeling surreal would be a great injustice."

Jonathan began attending Andrews as a freshman in 2011. Now, just five years later, he has graduated as an honors student with degrees in engineering, physics and mathematics. On top of that, he has both a mission year in Lebanon and a study tour to Australia under his belt and will now adventure on to Stanford to pursue a master's degree in electrical engineering.

His passion? Jonathan wants to create Christ-centered technology intended to draw hearts and minds closer to the Creator who has led him to places he couldn't have imagined probable. He first felt this interest develop upon discovering the Godpod–an ingenious solar-powered audio Bible that requires no batteries and absolutely no maintenance. The Godpod was originally created for underdeveloped countries and places like North Korea and Myanmar, to allow people there to listen to the Gospel.

It may seem like a formidable journey to graduate with three demanding degrees when for most, even attaining one degree sounds stressful.

"It was actually rather easy to complete three degrees at once," Jonathan says. "There was a lot of overlap between my degrees, so it felt more like double-majoring, which is pretty common for students at Andrews."

And what changed the idea of attending Stanford from a distant dream to a tangible, possible option for his future? Jonathan credits his research in Australia (a trip that was both a result of his connections and mentors at Andrews and partly paid for by Andrews University), where he worked hands-on in a professional laboratory testing the temperature durability of various technologies.

"The work I did in Australia didn't make me realize I loved science," he says. "I already knew that. What it made me realize is that I could spend my entire life contributing to science, but I would still die wondering what impact I made on humanity. That's why I want to draw people to God through Christ-centered technology like the Godpod.

"The Godpod is the handheld embodiment of the great commission given to us by Jesus Christ put into action," Jonathan explains. "It also reflects Andrews University's core strengths: Live Wholly, Explore Intentionally, Learn Deeply, and Engage Globally. Andrews challenged me to live out these principles throughout all five years of my undergraduate experience; this is especially the case with my mentors I chose," says Jonathan.

Overall, Jonathan tried to stay as involved in the opportunities available to him as possible while studying at Andrews.

"That's what makes the difference between a fulfilling undergrad experience and a mediocre one," he says. "No matter where you go, there is no better time to fail than undergrad. Fail fast and fail forward. Get out of your comfort zone. I did not meet my wife from within my safe box while at Andrews, and that was arguably the best part of my entire undergrad education!" he says with a grin. "So branch out, find mentors and people to guide you. They will be your most valuable connections–friends even–later down the road. This is especially true if, as mine did, they help you stay connected to God."

Excerpt by **Megan Ehrhardt**

A Tribute to Austin Currie & Chandler Koerting

On Sabbath, Nov.19, 2016, tragedy took the life of two of our finest—Austin Currie, a junior engineering student from the great state of Illinois, and Chandler Koerting, a junior computer science student, also from Illinois. They were inseparable friends—inseparable in life and in death.

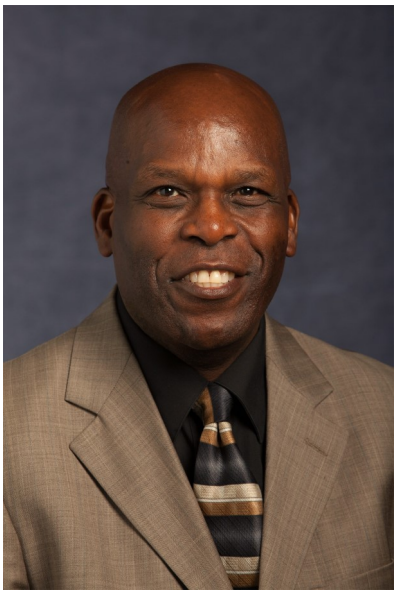
Austin was remembered as a fun-loving and deeply caring friend. He was regarded as one of our best RAs, who often routinely spent Sabbath afternoons cooking for friends. He was also known for sharing meals sent to him by his father with others. A fun fact that brought laughter to last evening's solemn occasion was that Austin wore flip-flops and shorts during all four seasons—even through the snow banks. On one occasion a young lady, whom he did not know, was stranded off-campus on a cold Michigan winter night because her car battery had died. She called one of her friends to assist her in jumpstarting her car, but that friend was unable to help and offered to send his friend instead. That friend was Austin. That act of kindness to someone whom he did not know left an indelible mark. And that act of kindness was not random—it was a mark of his character.

The fact that Chandler genuinely cared when no one else did was a sentiment that served as a common theme during last evening's sharing. He was incredibly kind and sincere. There was depth to his caring. He had a winsome smile that could put anyone at ease. Not to be undone, Chandler's friends also recounted his funny side—he could manage to take a nap in any position. One of his friends described a time when Chandler, who is much taller than her, placed his arm on the crown of her head during a casual greeting. She became curious when the weight of his arm seemed to get heavier. She looked up, and there was Chandler, taking a quick nap.

These two young men have provided us with a legacy of how to live. They have demonstrated with their own lives that our legacy has less to do with longevity and more to do with a life of fullness and quality. Our campus was reminded that Austin and Chandler lived their core values and embodied the Andrews spirit. And so, as we punctuate with this loss, we say with the throng of the faithful, "even so, come, Lord Jesus." Amen!

(Excerpt taken from **Stories of Andrews**)

Retirement of Dr. Agoki



George joined Andrews University College of Technology in fall 2001 as Director of the MSA in Engineering program. He carried it as the primary professor in this graduate program as well as teaching undergraduate engineering courses. In addition to teaching, George played a leading role in ABET accreditation, was sponsor of the Asante student club, president of the Bugema Alumni and Supporters Association in North America, and sponsor of the Andrews chapter of the National society of Black Engineers. He participated in the Jail Chaplaincy Program of Berrien County. He helped the Benton Harbor Housing Commission with computer literacy classes.

His research hinges on his ability to identify interesting research problems that would escape another eye. Current research interests include transportation safety, evacuated tube transport. Prior to coming to Andrews, George had taught in two public universities in Kenya, was Deputy Vice Chancellor of the University of Eastern Africa, Baraton; and Principal of Kamagambo Adventist College. George has 40 years of university teaching and 30 years of denominational work. He worked as Design Engineer with Norconsult A.S. for a number of years while teaching as well.

Our students and faculty will miss him but wishes him well on his future endavors and journey!

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