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LET’S GET TO WORK.
Welcome to the Fall 2018 semester – I hope that everyone back on campus had a productive and restful summer. We at Engineers’ Forum are excited to release our first quarterly magazine of the 2018 – 2019 academic year. In this issue, we focus on the human factors of pursuing an engineering degree at Virginia Tech, and walk you through some opportunities available to students in the engineering program and beyond.

Caitlin McConnell, a senior in the College of Engineering, kicks off the issue with a synopsis of the offerings of major engineering-related groups on campus. For a synopsis of happenings on campus, particularly for those looking for a handy reference for what they might pursue while an engineering student here, Caitlin’s article is a worthy read.

Jin Tian Acton writes two articles for us this month, the first an interview with recent graduate James Taylor, who majored in Computer Science in the College of Engineering and now works for Facebook. For a reflection on engineering from the perspective of someone who has made it through, check out this piece. Jin Tian’s second piece chronicles the O-Show, an opportunities event hosted by the Center for the Enhancement of Engineering Diversity (CEED) in the College of Engineering. In this article, Jin Tian describes the freshman take on their first exposure to curricular and extracurricular options offered by the College.

New writer Lily Chen is also featured in this issue, offering insight into her summer 2018 internship at Booz Allen Hamilton. For a picture of what engineering students are up to over the summer, look no further than Lily’s account of her experiences.

Freshman Alex Petsopoulos contributes a reflection on his first weeks at Virginia Tech. His candid reflection provides a good comparison for the thoughts provided by a recent senior in Jin Tian’s question-and-answer article.

We at Engineers’ Forum are looking forward to a productive year for the magazine. As always, we are seeking writers, photographers, and social media and web personnel to work for the Forum. Please don’t hesitate to contact me at akrinos@vt.edu for opportunities.

Until next issue,

Arianna Krinos
Editor-in-Chief, Engineers’ Forum at Virginia Tech
On the Cover

Atlanta skyline from
Lily Chen’s Internship Reflection

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FEATURES

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Caitlin McConnell

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Jin Tian Acton

O-Show!
Jin Tian Acton

Internship Reflection
Lily Chen

Opinion: A Freshman’s Reflection
Alexander Petsopoulos
Welcome, both new and returning Hokies!

With a new academic year beginning at Virginia Tech, various engineering organizations are eager for new members to get involved in campus life. From the Galileo and Hypatia Living Learning Communities to the Graduate Engineering Mechanics Society, there are many opportunities to get involved.

There are over 100 engineering organizations on campus. Many of these organizations have additional programs that are dedicated to outreach targeting K-12 students.

Information is provided below on just a few of the organizations at Virginia Tech.

**BIOMEDICAL ENGINEERING SOCIETY STUDENT CHAPTER**

The Biomedical Engineering Society club is a joint program that works with 30 undergraduate and 90 graduate student members. The goal of the organization is to bring together the College of Engineering at Virginia Tech, the Virginia-Maryland Regional College of Veterinary Medicine, and the Wake Forest University School of Medicine. The organization allows individuals to get involved in the scientific community, and helps apply the knowledge of biomedical engineering within the local community.
BOLT

The BOLT team at Virginia Tech works in the Joseph F. Ware Jr. Advanced Engineering Lab on campus. Using the design of high performance electric motorcycles, they are working to create a racing motorcycle that is 100 percent electric. The team competes in events like the all-electric TTXGP North American Series and the AHRMA eSupersport class. The group strives to make motorsports better for the environment by evolving current automobile technology to have cleaner emissions.

CHEM-E-CAR

This organization applies chemical engineering principles, programming, and circuitry to control a shoebox-sized vehicle with chemical reactions. The team works together to problem solve, research, and design the finished product, which is entered in competitions in both the fall and spring. The team currently consists of 10 members ranging from sophomores to seniors, but the students are looking to expand to 12 members in order to create two separate teams and increase their chances in the competition.

CONCRETE CANOE TEAM

This engineering design organization fundraises, designs, tests, and constructs a concrete canoe form. Once the canoe is removed from the mold, it is sanded, coated, and presented at the Regional Concrete Canoe Competition.

Many steps in the process, including mixing the concrete, managing the construction of the canoe, and analyzing its strength, require advanced civil engineering knowledge. Ocean engineering skills are also required to design the hull. The team consists of fifty undergraduate student members, and is always looking for more!
ENGINEERS WITHOUT BORDERS

Engineers without Borders (EWB) works with disadvantaged communities—both locally and internationally—to improve quality of life. They develop and deliver engineering projects that make life more environmentally and economically maintainable for these areas.

EWB's Uganda Project required the assessment, operation, and monitoring of photovoltaic systems. In a region with spontaneous electricity blackouts, this kind of technology is crucial. The group completed projects in Guatemala and Nigeria as well.

There so much to be gained from the experiences this organization offers, from hands-on experience around the world to improving teamwork skills. EWB at Virginia Tech welcomes all majors.

HYPERLOOP

This organization’s mission is to create an environmentally friendly transportation system that uses batteries to power hyperloop propulsion. The goal is to develop a levitating pod that travels through a vacuum tube powered by solar panels.

Hyperloop is a student-led organization comprised of aerospace, electrical, computer, and mechanical engineers, as well as engineering science, computer science, and mechanics majors. The completed design is entered in competitions across the US.

ORBITAL LAUNCH

VEHICLE TEAM

Students in this organization are designing a two-stage rocket that can break the Karman line and enter into low earth orbit. If successful, the project will provide low-cost access to space. The team gains great hands-on engineering experience and the opportunity to impact the space industry.
SOCIETY OF WOMEN ENGINEERS

SWE is a professional, social, and service network that helps empower women in Science, Technology, Engineering, and Mathematics (STEM) at a national level. There are many service projects completed each year within this organization on our campus that promote females in engineering and encourage young women to pursue a career in a male-dominated field. Members at Virginia Tech help the environment in the New River Valley by participating in the Big Event and many other opportunities.

The society promotes community outreach through events such as Brownie Day, where Girl Scouts participate in activities to spark their interest in STEM. The team also hosts Women's Preview Weekend, where incoming female freshmen visit Virginia Tech’s campus and explore the possibility of becoming engineers.

SWE is an international community, and professional memberships are only $50! Members at Virginia Tech can attend a national conference to network with representatives and learn about the organization’s history.
WIND TURBINE TEAM

This team strives to design and build a functioning, small-scale wind turbine that will be used to compete in the Collegiate Wind Competition. The competition, which is hosted by the Department of Energy, requires a team to build, market, and choose a simulated location for a wind turbine.

The Virginia Tech team consists of 45 undergraduate engineering students that are separated into five sub-teams to allow individuals to gain hands-on experience and leadership skills.

There are clearly plenty of ways to get involved in an engineering organization at Virginia Tech! A complete list of the different clubs can be found at:

https://gobblerconnect.vt.edu/organizations?query=engineering

or

https://www.sec.vt.edu/Organizations.html
ADVICE FROM A RECENT GRAD

INTERVIEW WITH JAMES TAYLOR

Graduated in 2018 with a B.S. in Computer Science with a minor in Mathematics and Cybersecurity.

Currently employed at Facebook.
1. What was your freshman year like?
Freshman year was a bit intimidating but went pretty well. There’s a lot to adjust to — meeting new people, time management, and finding your way around. A lot of time was spent getting used to living in a dorm and acclimating to college life.

2. What is the biggest piece of advice you would give to an incoming freshman?
My biggest advice to freshmen would be to get involved early. Be willing to reach out to your professors, seek out undergraduate research opportunities, and try to participate in a lot of clubs. It will be these experiential learning opportunities that stay with you after college and help you professionally. I would have never predicted or planned out the path that I took in college. Be willing to experiment and look out for opportunities.

3. How did you decide on Computer Science as your major?
From an early age I developed a passion for programming and creating things. I was always the kid who always was curious about how things worked and loved the challenge of figuring things out, making CS a great fit.

4. What is something you would have done differently during your 4 years?
I would probably get involved with undergraduate research sooner. I really connected with my professors in my junior and senior level computer science courses and I wish I would have been able to work with them sooner.

5. In what ways have you changed and grown during your time here?
I’ve definitely learned to manage my time better. I feel like college helps you find your strengths and learn to be a more

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independent thinker. College will make you better at juggling lots of different responsibilities.

6 What sorts of things outside of classes would you recommend getting involved in?

There’s a ton of options: (in-major and extracurricular) clubs, undergraduate research, teaching assistant positions, and other community / academic groups. If you’re short on ideas, attend Gobblerfest and/or reach out to your professors and academic advisor for suggestions. During my junior and senior years I split my time between academic research, CS-related clubs (like ACM and VTHacks), mentoring students (as a TA and as a part of more formalized mentorship programs), and responsibilities as a department ambassador.

7 What was your favorite class?

My favorite class was CS3214: Computer Systems I took with Professor McQuain. It’s a foundational computer science course covering a variety of Unix / OS topics. I was a teaching assistant (TA) for the class for three semesters after I took it. I loved the programming projects and helping other students in the course. As a freshman, I think it’s important to realize just how many support resources Virginia Tech offers; TAs / office hours are a great example. My job as a TA is one of the most rewarding experiences I had at Virginia Tech.

8 Did you have any free time outside of work?

Throughout all four years, I liked to stay busy. I think the goal should not be having more free time, but rather seeing the value in your own work and enjoying it. Despite having a crazy schedule, I always made time to go out on weekends with friends.

9 What is it like working at Facebook?

It feels strange to hear about the academic year starting and not to be back in Blacksburg, but I’m definitely enjoying my time so far at Facebook. Even as a freshman, it is never too early to start thinking about post-college career aspirations, building your resume, and checking out all the great career fairs Virginia Tech hosts every fall semester.
Virginia Tech’s annual O-show offers freshmen majoring in engineering a chance to get a better feel of what they’re interested in within the engineering curriculum. Booths are lined up in Goodwin Hall filling the hallways with different clubs, organizations, and companies hoping to attract interest. Not only does this give the freshmen a way to network and get involved in extracurriculars, but it also shows them exactly how many different opportunities VT offers.

There were many different tables, all featuring very different companies looking to recruit. According to Huy Nguyen, the Society of Asian Scientists and Engineers (SACE) are interested in “anyone who feels like they don’t know where to go is welcome, because SACE is about giving people a sense of community!”

Marybeth Ramey, graduating 2019 spoke on behalf of the International Society of Automation (ISE): they are interested in “whoever has an interest in automation and would like to pursue an education that they might not get in a classroom.”

Despite the craze of everything, everyone seemed to enjoy the show. Sophie Bosse, graduating 2022), described it as, “really informative and cool to look around and see all of the different things”
Another freshman, William Zaccaria, said, “I like how they stressed the large variety of groups here. Even if you’re not particularly knowledgeable about the group and what they do exactly, they still have a need for you.”

Since freshmen engineers are not allowed to specialize, these booths give them a better idea of what they might want to major in in the future. While the freshmen can’t join every club, it seemed that most of them found a few they were interested in.

Freshman Aidan Messick found one club particularly interesting. “I was really interested in the tech robotics because I did FTC (First Technology Challenge) in high school. I loved the competition.”

While some freshmen came on their own, many were accompanied by mentors from the Engineering Mentorship program, the Center for Enhancement of Engineering Diversity (CEED). Not only do the CEED groups help the engineers meet other freshman and make connections at such a large school, but they also helped them meet upperclassmen who offer advice and help them out on campus. While the individual reasons for joining the program varied, mentee Assudosh Tiwari said, “I’m the new guy here, so I just want to explore

Molly Swanson (2021), Willi Urban (2022), Kyle Carskadden (2022), Aidan Messick (2022) & Elise Burr (2021)

CEED Mentors take their mentee groups to the O-show to look at different organizations and get involved.

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Joshua Zuidema - 2006
Justin Rogers - 2019

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what’s best for me. With CEED, I’m going to be introduced to a lot of seniors who can help mentor me and achieve academic as well as individual personal excellence.”

The event was a success. Everyone seemed eager to participate and learn about different types of engineering and their possible applications. At a school with 30,000 other students, the first year can seem overwhelming, and it can be hard to find things to get involved in. The O-show did a great job of showing engineers different organizations that would not only help them decide what type of engineering they wanted to pursue, but also help them meet others who are in the same boat.

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WE’RE STRONGER TOGETHER

The International Society of Automation (ISA) is a new club that hoped to find engineers interested in learning outside of the classroom.
Doers. Dreamers. Drivers.
Change. Empowered by you.

These are the Booz Allen Hamilton catchphrases that resonated through my ears and mind all throughout this past summer. While many of my fellow peers spent time exploring Asia and Europe, I relocated to Atlanta, GA to intern for Booz Allen Hamilton. BAH is a management and information technology consulting firm headquartered in McLean, VA. The BAH Summer Games program consists of a 10-week period where interns from all across the country are assigned to teams to work on set problems or challenges under a specific FSO or functional service offering. The experience concludes with a three day conference at the headquarters in Washington, D.C. where all groups come together for final presentations with one group proceeding to win the ultimate Challenge Cup. Throughout the duration, interns all around the country also participated in what was called the Passionate Service Project, specific to each interns’ location. For my team, we volunteered at the Atlanta Food Bank and UrbanFarm. While we may not have won the Challenge Cup, my 10-week internship was unparalleled and nothing short of incredible. Not only was our team able to develop a user-friendly web-application/dashboard for Centers for Disease Control and Prevention.
(CDC) with both scalability and extensibility, we also took away extremely important interpersonal skills for potential careers in consulting.

On the back-end, I worked using SSMS to connect and query data in Azure SQL database. In setting up the back-end, we seamlessly were able to streamline all data being collected in CDC laboratories. What few people know, is that data collection methodologies at the CDC are fairly antiquated - paper and pencil being the most common form of collection. As a result, efficiency of laboratories is hindered and time is being wasted.

In order to create a dashboard accessible both on mobile devices, tablets, and desktop computers, we opted for a web-application developed extensively in Visual Studio. Through Visual Studio, as with any other integrated development environment (IDE), we were able to utilize the creative launching pad to debug, build code, and publish our application. Finally, we used HTML and JavaScript to create a minimum viable product (MVP) hosted on Microsoft Azure to present to the judges in Washington, D.C. The web application, which we named Digital Lab Assistant or DLA, was met with much approval from senior leadership and will continue to be developed although all the interns, myself included, have now

Lily Chen and fellow intern Anna JC mulching during the Passionate Service Project 2018 at the Atlanta Food Bank and UrbanFarm.

Four of the five members on the Atlanta intern team, along with our Challenge Leaders, pictured after a morning of community service.
departed our office spaces and settled back into our college lives. The future of DLA is exciting and revolutionary.

Digital Lab Assistant (DLA) is now being piloted with the first phase, using Dell Venue 11 Pro tablets, in the National Center for Immunization and Respiratory Diseases (NCIRD) and Office of Infectious Diseases (OID) at the Roybal campus in Atlanta, GA where CDC is headquartered.
I’ve been fascinated by spacecraft and exploration for the greater part of my life, from space shuttles to Mars rovers. These momentous feats of human achievement left me forever inspired, since I was a six-year-old watching my dad take pictures of Mars through his telescope, I knew I wanted to be an engineer. I decided to make Blacksburg my home for these next four years for reasons that extend far past Tech’s numerous top rankings in academics, research, and incredible campus food. Virginia Tech’s College of Engineering (CoE) is so much more than a number and a ranking: it’s a community and a way of life. However, I’d be remiss not to address our unparalleled academics here at the CoE.

Ethan White, one of my suitemates, and a sophomore majoring in Chemical Engineering, has similar thoughts on Hokie Engineering. He describes that what ultimately made him choose VT was “the 80% post-graduation employment/continuation to grad school rate, coupled with the affordable in-state tuition, making Virginia Tech the obvious choice in terms of being the most economically sound school on [his] list.”[1] White continued that, “Hokies get jobs. VT Engineering was obviously going to provide the highest return on my investment, but ultimately, it was the unparalleled sense of community that I experienced throughout my childhood that made me choose Tech.”

As an engineer and a lover of numbers, I fully understand the value of the statistical data that defines the financial worth of a VT education. But as a writer and a musician, I know that numbers can’t explain everything. One of the most important aspects of Virginia Tech’s College of Engineering is the community that supports and cares for all its members. From my first campus visit at Engineering Open House, to my second week of college, I can say with perfect certainty that Virginia Tech engineering is nothing less than a family.

Hokie engineers take care of each other, and they take care of their community. The Ut Prosim lifestyle at Virginia Tech is the most prominent aspect of the engineering program I’ve noticed this past week. We students help each other in the little ways, like pointing the lost freshman through the identical hallways of McBryde Hall. Ut Prosim isn’t just a student motto. The faculty at Virginia Tech are always willing to lend a hand and go out of their way for students.

During my first two days of classes, I went to meet with my academic advisor in Goodwin no less than three times. Each time I came back to his office, I was greeted with a welcoming smile and genuine helpfulness as we addressed my ever-changing schedule. The professors here also go the extra mile to ensure student success. I’d like to mention that my
chemistry professor personally reassured me during her office hours that I could make the five-minute blitz between her class, which ends at 9:55 AM, and my 10:00 AM chemistry lab; she even drew out a map of the fastest route for me! The students and professors I’ve met through the college of engineering this past week have been phenomenal students and professors, but more importantly, they’ve been kind, caring, and compassionate people.

Besides the academics, community, and excellent value of a Hokie education, one of the primary reasons I picked VT Engineering was Tech’s authentic “Hands-On, Minds-On” approach to learning. The first-year General Engineering program was of significant interest to me, especially the Foundations of Engineering classes. I liked the idea of two separate classes taken in the first year that not just teach the differences between each of the CoE’s 14 undergraduate degree-granting majors, but let the student make an informed decision about what they want to study through hands-on learning. The stories my friends who had already gone through ENGE 1215 and 1216 told me about building drones and windmills in class excited me further about STEM, and helped make VT Engineering an easy first choice. Virginia Tech also has many spaces available to all engineering students that allow us to conduct independent research and design personal
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My experience at orientation this summer further cemented my confidence in my decision to attend Virginia Tech. From jumping with my classmates for the first time to Enter Sandman at introduction in the Moss Arts Center, to the welcoming smiles and leadership of the upperclassmen volunteers who led my group, I learned that the Hokie Nation is strong; we work together to make incredible things happen. I came to Blacksburg because I want to be on the team that puts a person on Mars, and I know that Virginia Tech’s College of Engineering has the community, resources, and facilities to help me make that dream a reality.
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