SPRING UPDATE

A remarkable year for Fowler Engineering

As we reflect upon our first year, we all knew the challenges and opportunities we faced in faculty and student recruiting; academic programs development; space design; and the building of new partnerships. None of us could have anticipated, however, that the COVID-19 pandemic would force us to finish the year teaching and learning remotely, and would have us saying "see you at commencement in the fall" to our first graduating class. With that as a backdrop, I want to say how proud I am to work with a remarkable team of students, staff, and faculty who accomplished the things you will read about in these pages despite, and in some cases, because of these unforeseen challenges. The Fowler Engineering family brings to life the compelling stories that make serving as Fowler's dean my greatest privilege and honor. I hope that this report finds you safe and healthy - thank you for taking the time to learn about what is only a small subset of our year's accomplishments.

L. Andrew Lyon, Ph.D.
Founding Dean
Fowler School of Engineering

Rendering of the first floor entryway to the Keck Center's Engineering Wing. The new home of Fowler Engineering will begin construction this June, with occupancy in the summer of 2021.

Fowler Engineering's response to COVID-19

This year has been an unprecedented one for higher education, but despite the challenges of remote work, online education, and a rapidly shifting public health crisis, Fowler Engineering has endeavored to make positive contributions beyond the traditional classroom setting.

Remote learning/service at a distance/distributed manufacturing. Since its inception in 2019, Fowler Engineering has invested wisely in additive manufacturing via low-cost, high-performance 3D printers that provide students with the ability to work on their 3D modeling and manufacturing projects on campus, at home, or in the dorms. With the transition to online learning, Fowler faculty member Jon Humphreys was able to leverage the fact that all of his students had a printer at their disposal regardless of whether they remained on campus, or moved home thousands of miles away. Using an open-source model for 3D-printable face shield frames, Jon and his students manufactured thousands of face shields and delivered them to healthcare workers at hospitals across the country, providing essential access to PPE supplies that continue to be in short supply. In parallel, a number of

Healthcare workers from St. Joseph's Orange and CHOC show off their deliveries of assembled face shields produced by students in Jon Humphreys' 3D printing class.

other grass roots efforts sprung up, with Fowler Associate Dean Erik Linstead printing shields in his garage, Grand Challenges Initiative Director Greg Goldsmith manufacturing out of a spare bedroom, Schmid/GCI student Alex Drivas starting a GoFundMe that helped support the printing activities of his classmates, and a number of other Fowler and Schmid College undergrads using their own small, portable printers to join in the effort from their homes. Much of the effort was also connected with and supported by our community partner, Matterhackers, who have led the way in building a community around the manufacture and delivery of PPE to front line healthcare workers. Together, we are providing PPE to local pharmacists and Chapman's own physician assistant students, while building up an internal stockpile should they be needed by other members of the Chapman community as we move back to in-person instruction. Moving forward, we expect that these experiences in delivering hands-on learning in a distributed fashion, and coupling that learning with service activities, will provide new opportunities for Fowler Engineering to lead the way in transforming engineering education.

Filling the computer science learning gap. The transition from high school to college can be incredibly stressful, and for students entering highly technical areas such as computer science and engineering, feeling unprepared for that technical rigor can lead to even higher levels of stress. This

sense of under-preparation became exacerbated for many students as their high schools moved online without the resources necessary to manage that transition. Given that the foundations of computer science and coding are vital for all disciplines within Fowler Engineering, Associate Dean Erik Linstead and Professor Elizabeth Stevens launched a 5-week, free, online course in computer science foundations and programming in Python. The course eventually enrolled more than 130 admitted Fowler students who enthusiastically engaged in college-level computer science curriculum, with the course materials being offered free through our partnership with zyBooks. Again, this effort points the way towards future programs that will allow Fowler Engineering to expand its reach and innovate around the ways we engage a broader set of learners.

Congrats to the class of 2020 – Fowler's first graduating class!

Chapman is dedicated to providing a proper, in-person, commencement celebration for the entire class of 2020, which has led to postponement of commencement until after September 1. However, the campus still managed to create a celebratory atmosphere for our students on May 22nd. Seniors received 'mystery boxes' at their homes, and upon opening them on the 22nd they found all sorts of Chapman memorabilia that helped them celebrate a virtual degree conferral and toast with President Struppa, the Deans, a number of other campus leaders, and some special surprise guests. Following that celebration, Fowler staff, faculty, and administrators held their own "Senior Celebration Cocktail Hour" via Zoom, where our inaugural graduating class was able to receive well wishes and congratulations from all of us in the School of Engineering. This technologically-enabled celebration even included a virtual "photo booth" so that our students could memorialize the event with snapshots of their favorite faculty and staff members. We look forward to seeing all of our graduates back on campus in the fall when we do it all again in person!

Fowler staff members Adena Hamlin and Kate Gutierrez handed out graduation stoles to our seniors - more than half of the students from our first graduating class were able to stop by the Keck Center for curbside pickup of their commencement swag.

Welcome to the newest Chapman engineers

While we sent off one group of students to bigger and better things, we welcomed a new group of students into Fowler School of Engineering. Working closely with the Office of Admissions and Strategic Marketing & Communications, we worked diligently to ensure prospective students were fully aware of all Fowler Engineering had to offer. Hosting a virtual Preview Day, offering a number of online Q&As, engaging our student ambassadors for outreach, and even doing old-school things

like getting on the phone with prospective students and their families, we endeavored to create a range of avenues for interaction despite the lack of physical access to campus. Through internal Chapman funds and the generosity of our support network, including Masimo, HireRight, and a number of individual donors, we awarded nearly $500,000 in engineering-specific scholarships to first year and transfer students. These funds allowed us to attract a remarkable group of engaged and energetic students, many of whom would not typically be able to access a high-end engineering education due to financial limitations. Additionally, we will be providing free MacBook Pro computers to approximately 25% of our incoming class, thereby ensuring that all of our students have access to the computing-intensive resources required by our programs. As a result of these efforts, we recruited our largest ever incoming class, reaching nearly 120 deposits across computer engineering, computer science, data analytics, and software engineering. Increasing student enrollment and program selectivity while simultaneously broadening representation and access suggests that students are excited about our creative approaches to engineering education, and that we are reaching groups who might not typically consider Chapman an option. Moving forward, we seek to expand our financial flexibility and capacity in offering Engineering scholarships, and also to increase our outreach and marketing activities to ensure we are seen as an outstanding place for the best and brightest students to become engineers and innovators.

Our newest cohort of students can look forward to working on their projects in the new Keck Center electronics labs.

Meet Fowler Engineering's newest faculty

Our ambitious enrollment goals are matched by our targets for faculty growth. Profs. Stevens and Linstead worked with a large search committee to solicit a remarkably strong applicant pool, narrow that pool, and interview a fantastic group of finalists for our numerous faculty positions. Thanks to an enthusiastic group of staff, students, and faculty, our top candidates clearly saw the unique vision of Fowler Engineering, and most importantly, saw themselves starting their careers here. In August, we will welcome the following new faculty to Fowler Engineering.

Maryam Etezad – Maryam is an experienced educator and engineer who brings a strong background in experiential, hands-on learning to Fowler Engineering. An electrical engineer by training, Maryam will work with all of
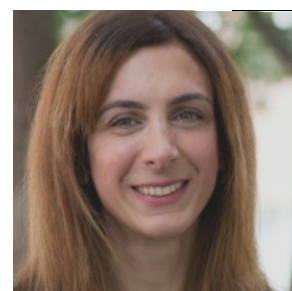
us to grow EE from the ground up into a program that provides deep technical training and immersive educational experiences to our students.

Franceli Cibrian – Franceli has established a strong track record as a researcher in the field of assistive technologies, and brings deep experience as an engineer to the faculty. Dr. Cibrian will contribute broadly to our educational mission across a number of courses, from introductory programming/computer science to human-computer interaction, to just name a few.

Nasim Estakhri – Nasim has an excellent reputation for her research in nano-photonics, metamaterials, plasmonics, and applied electromagnetics and will leverage her past contributions to build a new program in photonics for communications, medicine, computing, and energy harvesting. An electrical engineer by training, Dr. Estakhri has ambitious plans for how to contribute to our educational mission and expansion of our engineering offerings at Chapman.

Jon Humphreys – Jon has already demonstrated himself to be an outstanding educator who is passionate about developing truly immersive experiences for our students. As a part-time member of the faculty, he spearheaded the development and implementation of our highly successful 3D Modeling and Manufacturing course. Now that he will be joining us in a full-time capacity, we look forward to working with him to continue to develop creative approaches to engineering education.

Chelsea Parlett-Pelleriti – Chelsea is already a strong contributor to our faculty on a part-time basis, while also completing her PhD work. Now, as a full-time faculty member, Chelsea will help us grow Fowler Engineering by giving us greater strength in Data Science and Statistics – areas that will be vital aspects of our programs moving forward. She has some fantastic ideas around how to broaden the reach of Fowler through online dissemination of data science tools and curricula.

Yuxin Wen – Yuxin plans on launching a research program focused on machine learning as applied to challenges in healthcare. Dr. Wen is also excited to contribute broadly to our educational mission across a number of courses across our data analytics, computer science, and electrical engineering programs.

This talented group of researchers and educators promise to raise the level of everything we do in Fowler Engineering, and I am absolutely thrilled to work with them to support our students, educate outstanding engineers, and create tomorrow's innovative solutions to the global issues we face today.

# Moving forward with the Keck Center's Engineering Wing

Despite our current challenges, planning for Fowler Engineering's new home in the Keck Center is proceeding on schedule. Contractor interviews took place at the end of May, and we anticipate the start of the planned 12-month construction in early June. The space we will occupy in the summer of 2021 promises to be both beautiful and highly functional, with lots of opportunities for collaboration, reconfiguration, and blurred lines between teaching and research. That blurring will be further enabled by a generous gift from the Ahmanson foundation: a $500,000 gift to outfit the electrical engineering labs with modern equipment for teaching and research. You can view a brief virtual tour through some key spaces in the wing at the following link:

https://tinyurl.com/y8ybjcb2

For a more detailed (and more computationally-demanding) view of the space, a full VR experience can be found at this link:
https://tinyurl.com/y8czro7x

The space innovations mirror those in the curriculum, which engages students in an almost "anti-disciplinary" approach to problem solving. In fact, our vision is so compelling, that we were featured in a special section on "tackling key problems in engineering education" in the American Society for Engineering Education's publication Prism –that article can be found here:
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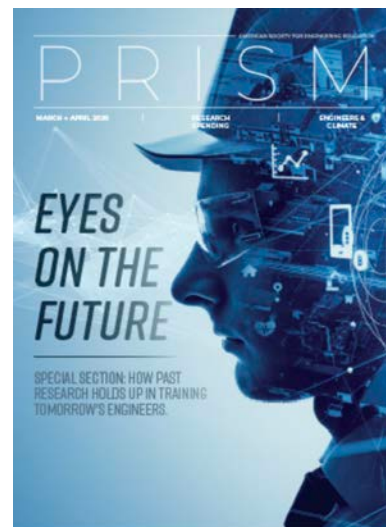
Fowler's expanded academic offerings

Our innovative approaches to "anti-disciplinary" problem solving are built upon the strong foundation of deep disciplinary programs. This coming fall, we welcome our first class in Computer Engineering - a new academic program that connects strongly to our existing strengths in Computer Science. Additionally, our degree proposal for Electrical Engineering was submitted just over a month ago and is planned for a fall 2021 launch. Like CE, the EE program will enable our students to become leaders in the ever-increasing array of technologically-enabled fields that are transforming nearly every aspect of our daily lives. Our faculty and students will continue to work together to blur the lines between "traditional" learning, research, and translational solutions, thereby producing real, impactful solutions designed around specific user needs.

Hardware prototype developed in Prof. Dhanya Nair's research group for use in a "haptic sleeve". The sleeve is an untethered wearable system capable of providing real-time haptic feedback to a user for handwriting training. Assistive handwriting training devices can not only help children with learning disabilities but could play a major role in rehabilitation of individuals affected by loss of fine motor skills due to neurological conditions.

Want to learn more? We would love to hear from you.

Visit our webpage: https://www.chapman.edu/engineering/

We are on Facebook: https://www.facebook.com/chapmanuniversityengineering/

Connect with us on LinkedIn: https://www.linkedin.com/groups/1822725/

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