EngiNews - Fall 2020

Welcome to EngiNews Fall 2020 issue. This is an update from SHU Engineering in the past summer and ongoing fall. Feel free to reach out to us for any questions, concerns, and comments at (kayat@sacredheart.edu).

Stay healthy and safe, and enjoy reading.

In This Issue

- COVID Adjustments
- Summer Internship + COVID study with Gabriel Bitencourt
- IDEA Lab News with Chelsea Coelho
- Recent Publications and Press Releases
- Student Quotes

COVID Adjustments

Over the summer Professor Tolga Kaya met with Cedric Bleimling, manager of the IDEA Lab, Professor Kevin Bowlyn, and Professor Ahmed to prepare class components in advance. He felt it was important for engineering professors to have a plan about how classes would operate if Sacred Heart moved to virtual. They worked together not only to make classes possible for students who were not returning to campus this fall, but came up with ways to incorporate social distancing in the IDEA Lab. For example, there are arrows on the floor and signs indicating that there is only one way to enter and a different way to exit. This prevents close contact between students and facility. Also, there are bleach wipes spread out throughout the space for students to wipe their desks down before and after using it. In the main space, there are red strips of tape where students should sit. This helps maintain social distancing. Furthermore, in the classrooms there are blue x's on the floor indicating where students should sit.

Summer Internship + COVID Study

It's senior year! Hope you did some internships along the way. A fellow senior and computer engineering student Gabriel Bitencourt has a lot to tell you about his internships. During his last three years at Sacred Heart, he has partaken in two internships. He stated that the second internship has stood out to him the most. Gabriel worked at an Aerospace company called Target Arm in the research and development division. He assisted in the assembly of their device that captures and deploys drones with packages on them, even when moving at 60+ mph. The size of the drone depends on how much package weight it can hold. They use quadcopters to test their device. The inside of the device is composed of tiny pieces that were 3D printed and externally is made up of metal, they call this device Tular. In theory, this device would then be put inside a special truck to operate.

His internship was this past summer, where he spent most of his time operating the 3D printers and sanding excess pieces on the 3D printed parts. It was important for him to make sure that each piece was at an acceptable quality for them to proceed in the assembly process. Eventually, he began to work on wire harnesses to control the arrays.

The cool thing about this device is all the possible opportunities this company has. This device can be used in applications from military use to drone package delivery. The company wants to be able to get into the commercial market as well.

Gabriel's big take away from this experience was the team, organization, manufacturing, and technical skills he has learned while interning at Target Arm.

Gabe also worked as the lead researcher in May 2020 for a Canadian company. This company stopped producing its product Jig-A-Clean over 10 years ago and was recently bought out by someone who has decided, in light of the pandemic, to bring back Jig-A-Clean to the market. This product is a foam that you spray on your hands and rub them together. It removes dirt, grease, germs, and oils. There is no need for a towel or running water.

Gabe was sent simulated germs that glowed under UV light. He had to code using a program called MatLab to process images in order to detect how many germs are left after applying the product to his hands. Twelve trials were conducted in total. The CEO of the company preformed four trials, and the rest were performed by Gabe. This was so they had a better data set. Together, their results were an average of 81%. This means that their product removes about 81% of the simulated germs. Gabe also discovered that a double application of the product is as good as soap and water! He stated that a minimum of 99.2% of the simulated germs removed!

Gabe's take away included improving his coding, and problem-solving skills, and being introduced into the field of image processing.

IDEA Lab News

The IDEA Lab is back in business!!! Chelsea Coelho, assistant manager of the IDEA Lab, explains the many opportunities to get involved there. For example, every Thursday night there is a different workshop held. Some of the workshops have been make your own lamps and soap, which were also part of the 50 First Days. Many of the workshops limit the number of students that can attend. This is to prevent large group gatherings. Also, if you are not available Thursday nights that is all right because you can just walk on into the IDEA Lab anytime during the day and be trained on specific equipment.

The staff is currently working on creating many more workshops throughout the year. They are pushing to get more involved on campus. They even collaborate with other departments such as GSA with the recent Graduate student night!

We hope to see you soon in the IDEA Lab with your mask!

Recent Publications and Press Releases

Recent Publications

Journal Papers:

K. Bowlyn and S. Hounsinou, "An Improved Distributed Multiplier-Less Approach for Radix-2 FFT," in *IEEE Letters of the Computer Society*, vol. 3, no. 2, pp. 54-57, 2020.

Note: Prof. Bowlyn worked with a collaborator in creating an improved multiplier-less structure for computing a radix-2 fast Fourier transform algorithm.

S. Dinc, B. Sahin, and T. Kaya, "Improved Sensing Response of Nanostructured CuO Thin Films towards Hydration Level Monitoring: Effect of Cr Doping," *Materials Science in Semiconductor Processing*, 105, 104698, 2020

Note: Prof. Kaya worked with his collaborators in Turkey to create nanoscale devices for sweat detection purposes.

Conference Papers:

M. Raval and T. Kaya, "Effect of Multinational Projects on Engineering Students through a Summer Exposure Research Program," IEEE EDUCON, Global Engineering Education Conference, Porto, Portugal, April 2020.

Note: Prof. Kaya presented a conference paper on Prof. Raval and his students' 1-month research visit from India.

Press Releases

Engineering Seniors to Work with Tech Companies

Professor Kaya wanted engineering students to do something unique and meaningful for their senior project, so he reached out to companies to see if they needed help with a project. Kubtec, Quanser and ECM PCB Stator Technology all responded anxious to begin working with Sacred Heart seniors. Kubtec worked with students to show them the current design, development and manufacturing opportunity that can assist in the treatment needs of breast cancer. Quanser worked with students to create a new standard for engineering education using drones. ECM PCB Stator Technology wanted to improve motor technology for young individuals. Sacred Heart students helped by working with regenerative motors.

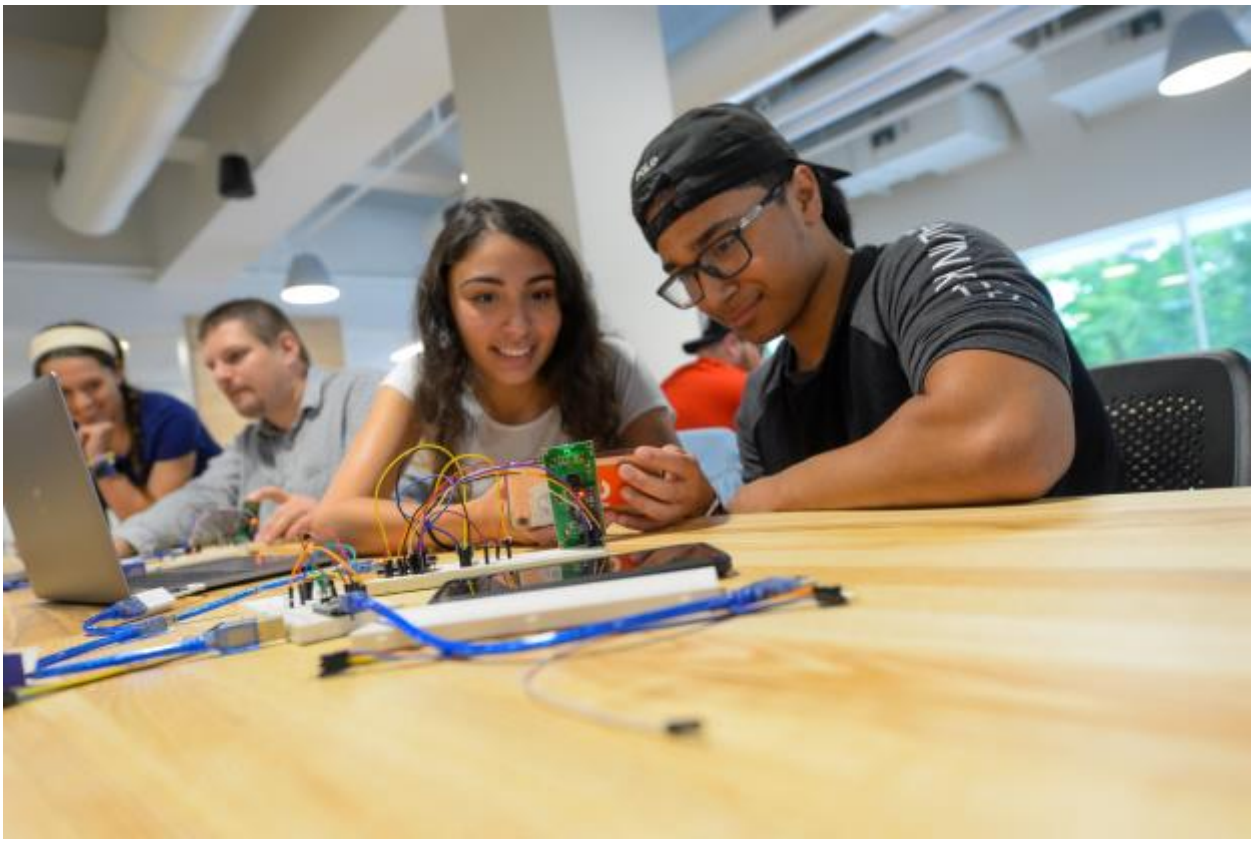
Sacred Heart Uses Its Resources to Help During Pandemic

Sacred Heart invited first responders and health-care workers to stay in residence halls. They also offered to house tents on its campus for hospitals in need of extra space for its COVID-19 patients. In doing so, they were able to provide set-ups for the hospital's tent. Furthermore, they sent medical supplies to area hospitals.

Professor Tolga Kaya and Cedric Bleimling, IDEA Lab manager, took home 3D printers from the IDEA Lab to manufacture face shields. They also took part in an initiative to create ventilators.

Furthermore, Sacred Heart donated unused computer bandwidth to help researchers find potential cures for COVID-19. The universities IT department downloaded software provided by Folding@Home on computers.

Quotes from our Students



Freshman

"Students should visit the IDEA Lab before classes begin so that they have an idea about what their next four years are going to be like. It will help them begin to understand what they are doing to be working on." - Bryan Feather

Sophomore

“Discrete Structures has definitely been my favorite class so far because it is math based. Also, the professors are always willing to meet with students for extra help.” – Benjamin Agyemang

Junior

“I remember during my first few months as an engineering student, being a part of SHU Innovate and meeting other students in a similar program to me was inspiring.” - Jillian Luciano

Senior

“Some advice I would give to a freshman would be do not give up and always ask questions. Your engineering classes won’t teach you how to be an engineer but will make you think like one.” – Jonathan Carpenter

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