

Dean's Remarks

Summary

In previous newsletters, we have reported on our tremendous success in sharing with other institutions our e-learning modules designed to develop an entrepreneurial mindset in students. To date, 55 faculty from 43

other universities and colleges have integrated our modules in their courses. In December 2017, the CTNext Higher Education Initiative and The Kern Family Foundation funded our proposal to further share our modules with Connecticut State Colleges and Universities with the goal of developing entrepreneurial talent for Connecticut. The Kern Family Foundation also funded an additional year of our successful mini-grant program, and we expect another 25 faculty at other institutions to deploy our modules in 2018-19.

Ibrahim (Abe) Baggili, associate professor of computer science and founder of the Cyber Forensics Laboratory, was named by *Connecticut Magazine* as one of 2018's 40 Under 40 in the state — people under the age of 40 who are excelling in their fields, leading and influencing others, and making a difference. Abe is a pioneer in the field of cyber forensics and is making significant contributions to advance the area.

Four students, Jillian Jacques, Matthew Sheehy, Austin Thomas and Dan Woronick, were inducted into the prestigious University Innovation Fellows (UIF) program this year. They will continue the momentum developed by our two previous UIFs and promote an entrepreneurial ecosystem at the University.

Maria-Isabel Carnasciali, associate professor of mechanical engineering, has been awarded a building, but the owner might not have any idea what it is costing them in terms of energy use due to faults, and some faults could be catastrophic and result in costly equipment failures. Commercially available fault detection and diagnosis (FDD) tools can be used to detect faults and let the owners or HVAC contractors know so they can look at the units, fix them, and achieve significant energy savings.”



Ravi Gorthala

manager, Jaykishan Ramani, and undergraduates Jesus Amado and Amanda Rimkunas. They are collaborating with two subcontractors — the United Technologies Research Center and the UTC Institute for Advanced Systems Engineering at the University of Connecticut.

“It is a sprawling, three-pronged project,” Gorthala said, “focusing on stakeholder education, outreach, and workforce development. At work since October 2017, the students have developed project management strategies, outlined tasks and milestones, and had a kickoff meeting. UConn and UTRC at the UTC Research Center,” Gorthala said.

The students are doing instrument data collection, data analysis, and research, as they explore FDD tools that exist on the market and those coming to market. They will be surveying businesses in the state why, if these products exist, they aren’t yet really commercially viable.

They’ve gathered around worktables testing dozens of sensors and constructed their own monitoring system so they can confirm the findings of the FDD tools. And they’ve been up on the rooftops of buildings working with technicians on a separate pilot FDD demonstration project funded by United Illuminating and Eversource under Energize CT to install the FDD tools and monitoring systems.

In a U.S. Department of Energy statement, David Nemetzow, director of the DOE’s Building Technologies Office, said the work aims to “improve our nation’s commercial building stock and cut energy bills for American businesses.” One of five leading-edge national projects to “improve the efficiency of the nation’s commercial buildings,” Nemetzow called the work “an excellent partnership among U.S. businesses, universities, and the Department of Energy.”

“It even stretches us beyond engineering,” Rimkunas said, noting that they are also fast becoming marketers. She was busy building the project website, and other team members are planning a major outreach event at the Energize CT Center to involve HVAC companies, the Connecticut Business and Industry Association, the Connecticut Retail Merchants Association, and the Greater New Haven Chamber of Commerce to

Sikorsky Funding Helps Support University Makerspace: A Place for Innovation and Experimentation

Four TCoE students were awarded highly competitive NASA CT Space Grant Consortium (CTSGC) fellowships to do space and aerospace related research. Jordan Rippe received the Student Project Award of \$1,000, Alexandra Goriounova received a \$5,000 research fellowship, and Leah Landsdowne and Jonathan Stanford received \$5,000 scholarships.

“This was a high point for our students who were competing for grants and scholarships among their peers from academic institutions including UConn, Yale, and the University of Hartford and others,” said Dequan Xiao, Assistant Professor of Chemistry and Chemical Engineering.

NASA CTSGC is a federally mandated grant, internship, and scholarship program that is funded as a part of NASA Education. There are Space Grant Consortia in all 50 states, Washington D.C., and Puerto Rico. Formed in 1991 by Trinity College, the University of Connecticut, and the University of New Haven with the University of Hartford as the lead institution, CTSGC encourages broader involvement in NASA research programs.

In October, the TCoE faculty, the Dean's office, and the University's American Chemical Society Student Chapter organized “Chemistry and Space Science,” a forum held at the Orange campus. It featured more than 40 student and faculty participants, including two keynote speakers from Yale, four University faculty speakers, and one Wesleyan postdoctoral fellow, an international student and

Building a Wall to Keep Hackers from Penetrating Medical Devices

On any given morning, you might decide to start the coffee maker from another room, turn the heat down in the house from three cities away, or have the GPS find a way to navigate around a sudden, snarling traffic jam, all thanks to the connected nature of the Internet of Things.

But a team of University students — Max Theokrito, Tejna Nagaraj, Jonathan Ramirez, Benjamin Miles, Benjamin Klemme, and John Bobish — who won last fall's Charger Startup Weekend Competition organized by the Entrepreneurship and Innovation Program — warn that ease can come at a cost.

"Consider all the millions of medical devices that rely on Bluetooth for connectivity," Theokrito said. "You could be sitting in Starbucks, accessing their Wi-Fi and detect all the Bluetooth devices nearby. With no authorization needed, you could connect to a device," Nagaraj said. "Some of those could be smartphones, but others could be pacemakers or another medical device," she said.

"Or you could go to a hospital and the nurse could place a pulse oximeter on your finger to check your blood oxygen level. And it's wireless," Ramirez said. "So that device is connected to many other devices in the hospital. What if someone wanted to intercept that, to hack in and use that way in to get at patient data? There is the chance people could do something malicious to people's medical devices."

So the team set out to essentially build a wall to keep hackers from penetrating medical devices.

Their solution? Apply authentication, identification, and data protection cryptography to life critical/connected medical devices to defend against hackers. "Implanted medical devices rely on Bluetooth or other connectivity standards to provide better healthcare to patients," Theokrito said. "Unfortunately, connectivity security is limited on these devices as they are small. We're working on low energy technology to drastically improve implanted medical device security."

Discovering a New Country and what it Takes to be an Entrepreneur

As the ferry floated along the Danube River, all of Budapest opened up before Kevin Rivas: the majestic Parliament building, the old world architecture in silhouette, the cobblestone streets.

So much was new last summer: that view, the parades, songs and merriment that spilled into the streets all over the capital city on St. Stephen's Day, the paprika, liberally sprinkled in so many dishes in Hungary, and the stories his fellow college students from Hungary, Russia, Serbia, Romania, and Italy told about their lives.

Over 10 days, Rivas, a mechanical engineering major, worked on idea generation and product development, collaborating with a team of students in two different business startup competitions. He took part in

Research can be thrilling and challenging **Callis**

At the same time, Aktas is developing a new course that will blend the Global Solutions for Sustainability course with the Professional Engineering Seminar course, creating "Sustainability, Ethics and Professional Issues" for engineering majors. They are discussing also keeping a sustainability course as students from all academic departments show interest. "Sustainability is an issue that many students care deeply about," he said.

Aktas is also at work on his own research, though he quips that his papers have almost been calling him lately saying, "What about us?" "I have multiple papers saved on my desktop that I am working on and that need my attention," he said.

It makes for a very busy life. But Aktas said he wouldn't have it any other way.

One of his projects takes a close look at hospitals and health care centers that are certified green, looking closely at patient health outcomes. He is studying whether a building filled with windows, ambient light, healing gardens, and green areas patients can spend time in improve a patient's health and well-being. He is comparing green hospitals with traditional hospitals.

"More natural light and access to gardens and plants are known to have positive impacts on health. But as an engineer, I want to be able to measure these outcomes," he said. "I want to see if we can prove quantitatively whether there is a benefit. If there is, then we can make a policy push that this be incorporated in hospitals, but if it doesn't, then we have to look more closely at the strategy."

When he was an undergraduate, following a traditional course of study in civil engineering at Middle East Technical University in Turkey, he was very interested in environmental issues and the resiliency of buildings and water systems. But he didn't have the opportunity to do research as an undergrad. "I would have loved it," he said.

After earning his master's in Turkey, he was planning to pursue a traditional civil engineering doctoral degree at the University of Pittsburgh when the university created a doctoral program in Sustainability and Green Design. Aktas was the first to receive a Ph.D. in the program in 2011. He taught at Robert Morris University and was drawn to the University of New Haven after speaking with then-new Dean Ron Harichandran. "He planned to embed sustainability studies and an environmental focus in engineering courses, and I knew I wanted to be a part of that," said Aktas, who coordinates the Sustainability Studies program.

LENN

Just as he did when he was younger, he spends a lot of time out in cities and in the natural world, on the shore, in parks, looking at the environmental impact of structures. When he looks at buildings, shorelines, at city sewer or water systems, at any engineering plan, he wonders first about its resiliency. Can it stand up to a changing climate, to changing rainfall patterns and battering winds?

