University of New Haven

TCoE TRENDS

Newsletter of the Tagliatela College of Engineering, University of New Haven | Spring 2014

Dean's Remarks

Momentum in the Tagliatela College of Engineering continues unabated. This newsletter features several accomplishments, and we will give more details of others in the fall. Here are some of the highlights:

- The M.S. in Big Data program that we will launch at NEU at the University of New Haven in Palo Alto, California in the fall of 2014 is a model educational partnership between a non-profit university and a for-profit company and the first of its kind pursued by a university in Connecticut. We are charting new territory with this program and intend to re-engineer engineering education.
- The cyber forensics initiatives led by Professor Ibrahim (Abe) Baggili are making a big splash – details are in the faculty spotlight article in this newsletter.
- We recently received funding from the Kern Family Foundation for the first year of a multi-year project titled "Developing Entrepreneurial Thinking in Engineering Students by Utilizing Online Modules and a Leadership Cohort." This project has the potential to brand the TCoE.
- The first cohort of engineering freshmen who participated in our study abroad program in Prato, Italy in the fall of 2013 gave the program rave reviews, as did many of their parents. We are recruiting incoming freshmen for what we hope will be a larger second cohort in the fall of 2014.
- We received approval from the State of Connecticut to offer a fully online master's degree program in environmental engineering that will launch in the fall of 2014.
- For the second summer, we will host the TEAM Summer Camp in partnership with Georgia Tech and sponsored by Sikorsky Aircraft. This year the premier Kent School will participate as a second Connecticut site.
- More of our students are engaging in research and scholarship, and several projects are highlighted on pages 2-3 of this newsletter.
- Our third Senior Design Expo, held on May 8, 2014, was the most successful to date, with many outstanding student projects and presentations and satisfied company sponsors.

These are good times at the TCoE, and I thank the faculty, staff, and students who are contributing to our success by working hard and working smart!

RSHarichandran

Ron Harichandran
Dean

Re-engineering Engineering Education

A Silicon Valley start-up is looking to create "T-shaped" engineers to meet the global need for more innovation.

In-depth knowledge in one's own discipline topped off with broad knowledge across a range of related fields – that, basically, is what a T-shaped engineer is, and it's the only type of engineer that is going to feel at home in the 21st century. It's all about collaboration and the ability to understand and interact with professionals in other areas.

Training T-shaped engineers turns traditional engineering education on its ear – which is precisely the motivating force behind New Engineering University (NEU), a start-up institution located in Palo Alto, California. Through a unique partnership with the University of New Haven, NEU aims to give birth to a new generation of T-shaped engineers by building "the most relevant, collaborative, and industry-connected engineering university on earth." NEU's program revolves around hands-on, project-based experiences that emphasize teamwork, communication, leadership, and entrepreneurship. The approach is expected to unleash a new wave of innovation and creativity to solve today's complex global challenges.

The term "industry-connected" is key. Traditional engineering programs focus on theory in a single discipline and perpetuate the disconnect between education and industry interests. NEU has embedded within its structure an enviable network of industry partnerships, which include such luminaries as Oracle, Facebook, LinkedIn, IBM, and Palantir. These industry partners play an essential role in developing competency-based curricula, in developing the course material, and in providing the real-world projects that students engage in.

They also supply the leading practitioners and industry mentors that make up NEU's faculty, thereby giving students direct access to working engineers and enabling them to forge strong ties with employers.

The first degree to be launched at NEU, in September of 2014, will be a 30-credit, one-year Master of Engineering in Big Data. In keeping with NEU's mission to marry technical training to 21st century skills, the program zeroes in on a high-demand market sector in order to give students the relevant experience they need to land jobs. Addressing the intersection

continued...

of three areas driving Big Data — technologies, analytics, and business needs — the program trains students to manage data-driven decision-making as well as use, analyze, and evaluate technologies and techniques in an enterprise setting. Graduates holding this degree will be able to design innovative solutions to Big Data challenges while taking economic and societal interests into consideration.

Although the program resides on the NEU campus in Silicon Valley, the degree will be granted by the University of New Haven.

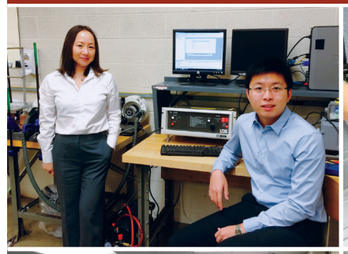
To fill its inaugural class, NEU is targeting recent engineering graduates and underemployed engineers. They are also going out of their way to try and attract more women, as the field has been overwhelmingly male-dominated. There is plenty of room for them. NEU's Provost, Lueny Morell, explains: "Last year, nearly 90 percent of U.S. companies reported difficulty hiring engineering talent, and 1.7 million cloud-related jobs went unfilled globally — in a sector that will produce 14 million jobs by 2015."

Several organizations are lending a hand in the recruiting: GoldieBlox, the female-targeted engineering toy company; the Geena Davis Institute for Gender in Media, led by the Academy Award-winning actor; Codecademy, the online coding platform; and MAKE, the drivers of the Maker Movement — the fast-growing trend of people using do-it-yourself (DIY) and do-it-with-others (DIWO) techniques to create technology products.

Because perception often makes up nine-tenths of people's reality, changing how potential students view the field of engineering is another facet of NEU's mission. Women, especially, tend to lose interest in the STEM disciplines (science, technology, engineering, and math) way back in middle school, so they never make it to the point where they can start seeing the exciting possibilities in an engineering career. NEU believes that emphasizing problem solving, design thinking, and social relevance over tools and technology can change minds, shaking up pre-conceived, outdated notions about the field.

The bigger picture in all of this is that in re-engineering engineering education, NEU says it will also help re-engineer the future. That's future spelled with a big capital T in the middle.

ON THE FRONT BURNER



STUDENT RESEARCH PROJECTS THAT ARE HOT RIGHT NOW:

RRM and QoS Provisioning for 4G Networks

Dr. Amir Esmailpour with Seydemohammad Salehi and Joswill Rodriguez. Radio Resource Management (RRM) and Quality of Service (QoS) provisioning are critically important in the next generation of wireless technologies such as 4th Generation (4G), Worldwide Interoperability for Microwave Access (WiMAX), and Long Term Evolution (LTE). This ongoing project in the UNH wireless Research Group (UNHwRG) started in 2011 and continues with one to two students working on different aspects of the project each year. Dr. Esmailpour and his students have designed, developed, implemented, and tested several solutions for packet scheduling and bandwidth allocation in LTE, WiMAX, and integrated networks and have published their findings in reputable publications worldwide, such as IEEE and ACM.

Spectrum Management and Allocation in the Next Generation of Wireless Communication Technologies

Dr. Amir Esmailpour with Gelareh Kokabian. Spectrum management is an important issue in communication technologies and, with the current speed of using up the radio frequency spectrum, it is critical that the spectrum is allocated efficiently to various technologies. The motivation for this study comes from a realization of the scarcity in the radio frequency spectrum. Due to the increasing rate of development in new radio technologies and the number of wireless devices, new wireless technologies are being developed every day, resulting in a heterogeneous mix of devices sharing a crowded range of spectrum. However, not all parts of a licensed spectrum band are currently being used efficiently. Those areas are known as white spaces.

LTE Security: Potential Vulnerability and Algorithm Enhancements

Dr. Amir Esmailpour with Gautam Siwach and Seyedmohammad Salehi. Security is a critically important area in the next generation of wireless technologies such as WiMAX and LTE. The LTE-Security subgroup of UNHwRG focuses on various encryption and authentication methods used in 4G technologies. This ongoing project in the UNHwRG started in 2011 and continues with one to two students working on different aspects of the project every year. They have discovered potential vulnerabilities in the implementation of encryption processes within the EEA2 algorithm of Long-Term Evolution (LTE) and have proposed an enhancement for the security features in LTE.

Hadoop Framework to Provide Fault Tolerance in the Cluster

Dr. Amir Esmailpour with Santoshi Kalyani. With the vast increase in the amount of information — a nearly 90% jump in the volume of data compared to previously recorded values in the past two years alone — it is essential to have proper facilities to handle big data. New database management technologies, such as those offered by the Hadoop framework, are being developed. Hadoop is an open-source software that is used for reliable, scalable, and distributed computing. Yet Hadoop has its own problems in its architecture, which results in point of failure in the job tracker. In this project, the researchers are designing a solution to handle the problems that may occur if the job tracker fails.

Xbox One Forensics

Dr. Ibrahim Baggili with Jason Moore, Andrew Marrington, and Armindo Rodrigues. Video game consoles can no longer be viewed as just gaming consoles but rather as full multimedia machines, capable of desktop computer-like performance. Game consoles have been used in criminal activities such as extortion, identity theft, and child pornography, but with their ever-increasing capabilities, the likelihood of the expansion of criminal activities conducted on or over the consoles increases. This research aimed to take the initial step of understanding the Xbox One, the most powerful Microsoft console to date, and documents the outcome of conducting a forensic examination of the Xbox One. The Xbox One was found to have increased security measures over its predecessor (Xbox 360). Various applications had different levels of security, and game traffic is encrypted. The encryption of the data and the new file types introduced made it difficult to discern potential digital evidence. Nevertheless, the team was able to find digital evidence such as times when the user initially set up the console and times when the system was restored or shut down as well as what games and applications had been downloaded, along with when the games were played. Jason Moore presented this work at the 2014 UNH Graduate Student Showcase and received the Best Presentation Award.

Exploring Android Banking Application Permissions

Dr. Ibrahim Baggili with Brett Ferris and Jay Stahle. Every application installed on a mobile device asks for permissions to access other features, such as the camera and phone book directory. Dr. Baggili and his students are exploring what information banking applications are requesting from iPhone users — such as the ability to listen to the user's surroundings — and the issue of privacy invasion those permissions entail.

Network Forensics of Instant Messaging Applications

Dr. Ibrahim Baggili with Jason Moore and Mohammed Al Saif. Smartphone ownership is on the rise worldwide and has already surpassed the ownership level of personal computers. Most people are using smartphones to communicate with others, many through instant messaging applications. This makes smartphones and, more specifically, chatting applications of the utmost importance in investigations today. In this research, the team examined what information can be ascertained by capturing the network traffic for eight popular chatting applications. While user-related data could not be recovered in five out of the eight applications, in three applications, namely, WhatsApp, Viber, and Tango, they identified substantial information that could be of great use in a variety of investigations.

Android Malware Forensic Toolkit

Dr. Ibrahim Baggili with ZhaoHeng Yang. Using a data set obtained from North Carolina State University, Dr. Baggili and his student are working on developing a machine-learning algorithm that is capable of looking at an Android application and deciding whether or not the application is malicious, based on its permission characteristics. The goal is to come up with a toolkit for investigators that categorizes malware and shows in what part of its code the malware could be doing something malicious.

Increasing the Power Output of Wind Turbines While Decreasing the Size of their Blades.

Working with **Dr. Maria-Isabel Carnasciali,** for his honor's thesis, **undergraduate student John Hamilla** carried out a performance analysis of the small-scale SunForcer® 600W wind turbine mounted on Buckman Hall. **Graduate student, Rahmat Roudi,** for his master's thesis, is modeling the wind interaction between the building and surrounding structures and the placement of the wind turbine. **Graduate student Barath Reddy** is beginning work on modeling the placement of the funnels or shrouds surrounding the small turbines, following the lead from Ogin Energy, which is applying the technology to utility-sized wind turbines.

Energy Harvesting and Vibration Suppression Using a Piezoelectric Transducer.

Piezoelectric-based energy harvesting devices can convert ambient vibration energy into useful electrical energy. The circuitry used for piezoelectric energy harvesting sensors is conceptually similar to piezoelectric vibration dampers. Working with **Dr. Cheryl Li,** for his master's thesis, **Zhepeng Liu** explored a dual purpose shunted circuit that can facilitate simultaneous energy harvesting and vibration control. They developed a fuzzy logic-based algorithm to select the circuitry elements for balanced optimization between energy harvesting and vibration control.

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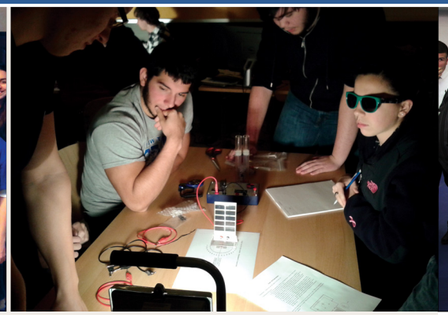

Study Abroad for Engineering Students? We Have a Campus for That.

Study abroad is an experience that most students dream of. And, most students have the opportunity to fulfill that dream. Unfortunately, engineering students are the exception. While students in arts and sciences, business, and other colleges excitedly pack their bags, jet off for a semester, and return with a broader world view and a certain "je ne sais quoi," students in engineering programs — whose courses are planned according to a critical sequence — have had to stay home. A missed or delayed course would definitely cause a glitch in the system.

UNH wanted to change that. Our new campus in Prato, Italy beckoned, our engineering students could practically feel the warmth of the Tuscan sun on their faces — and so our faculty went to work, figuring out how to incorporate study abroad into the curricula.

First-semester, freshman year. That was the answer. All first-year engineering students take the same fundamental engineering courses, so it was not a problem to simply teach those courses in Italy.

That's all 17 first-year students from every engineering discipline needed to hear. They were off. Last fall, led by Professor William Adams — who teaches the courses — they landed in Prato, a medieval town with a rich and tumultuous history, just minutes by train from Florence, Siena, Pisa, and Lucca.

There's a certain rightness about engineering students studying in the cradle of the Renaissance, surrounded by breathtaking works of art. As Adams told his group, "The artists were the engineers of that time, thanks to their understanding of dimension and linear perspective. They were the ones responsible for the rebirth of engineering."

The students found the Duomo in Florence — also known as the cathedral of Santa Maria del Fiore — particularly fascinating. Begun in 1296, the cathedral was, by 1418, ready for its roof. But a dome of the size needed hadn't been built since antiquity, and the secrets of engineering such a structure without it collapsing under its own weight during construction had been lost. It took Filippo Brunelleschi, a former master goldsmith, to design and engineer the solution. His four-million-brick dome is a testament to his mathematical genius and a revelation to all students of engineering.

But whether they were gazing awestruck at the Duomo or at the actual telescope used by Galileo, these future engineers were also picking up a critically important lesson during their explorations. They were learning that there are other ways of thinking, designing, and doing. For today's engineer, living in a global neighborhood, that lesson needs to hit home hard. Fortunately, there's scarcely a place on Earth more ideally suited to learning that lesson than Italy, thanks to its political history. The country was once made up of a collection of independent city-states, which were in perennial competition with one other. Each one had its own way of doing things and its own standards — even for measurement.

In addition to their engineering courses, the students were required to take an Italian language class so that they could immerse themselves more fully in the day-to-day Italian lifestyle. The local cafés bore witness to the fact that they did exactly that — "con molto entusiasmo."

According to Adams, the benefits of studying abroad are apparent as soon as the students return to the U.S. "They come back with a level of maturity and leadership ability that you don't see in many first-year students."

Michael Tracz, an electrical engineering student who was a member of the group, had his own reason for going: "The main reason I wanted to take part in this opportunity was to make lifelong friendships before I stepped onto campus." He did.

Although some parents believe their child should get used to college life first and then study abroad (not possible for engineering students anyway), Adams believes that first-semester, freshman study abroad actually helps in the transition to college life. "Think about it," he says. "You yank a kid out of high school where he's comfortable in a small group and land him on a college campus with 5,000 other students. That can be traumatic. With study abroad you don't have to get to know the whole world. You're part of a small group, and you'll have that group as support when you get back."

What do the parents of his students say about the whole experience? "Amazing," "My son is more focused on his studies," and "I'm so glad my daughter went" are typical of the feedback Adams receives.

And then there's this, from one shocked mother: "They come back, and they're cleaning their rooms!"

It doesn't get much better than that.

To see past issues of TCoE Trends, go to
www.newhaven.edu/engineering/TCoE-trends

3rd Annual Engineering and Science Career Fair.

The Employment Numbers Are In.

- Consigli Construction is interviewing four students for a project management internship position.
- BRASH Engines is interviewing three to four students for internship positions.
- Encon is considering three to four applicants for full-time positions.
- Northeast Utilities accepted four to five students into their internship program.
- Perkin Elmer is interviewing two students for full-time positions.
- Stanley Engineered Fastenings has conducted three phone interviews with students.

It was fertile ground for student job hunters at the 3rd annual Engineering and Science Career Fair, which was held, for the first time, in the Beckerman Recreation Center on February 20th. It had to be held at Beckerman. It was the only venue on campus large enough to accommodate the spectacular turnout. The event drew thirty-three companies and 175 students from UNH's engineering and science majors. Armed with their résumés and a little courage, the students took this golden opportunity to practice their skills in the art of networking and some subtle (or not-so-subtle) self-promotion.

The event was intentionally planned to coincide with National Engineers Week, which takes place the third full week in February. This year, UNH's Career Development Center took the lead in planning, logistics, and employer recruitment for the Career Fair and expanded the event to include science majors as well as engineering majors, another first. Thanks to the Center's efforts, twice the number of companies as last year attended, with the whole event taking on a new professional sheen.

Meanwhile, "The TCoE faculty and Dean Harichandran's office did a great job in getting students to attend the event," said Matt Caporale, Executive Director of Career Development.

At the end of the day, the students were extremely glad they listened to them.

The participating companies were:

- APS Technology
- Ashcroft,Inc
- ASR Corp
- BRASH Engines
- ClarkDietrich Building Systems
- Connecticut Dept of Energy and Environmental Protection (DEEP)
- Consigli Construction Company
- Dealertrack Technologies Registration & Titling Services
- Diversified Technology Consultants
- Emerson Process Management
- Encon Inc.
- Enthone
- FM Global
- Gems Sensors
- General Dynamics Electric Boat
- Glenwood Systems LLC
- GoECart
- Kitchen Brains
- MacDermid
- Noble Consulting Group
- Northeast Utilities
- PerkinElmer Inc.
- Professional Women in Construction
- Proton OnSite
- Stanley Engineered Fastening
- State of Connecticut Department of Transportation
- Thule
- U.S. Navy
- UNAPEN Inc.
- UNITED STATES MARINE CORPS RECRUITING
- Virtusa
- Whiting-Turner
- Yale New Haven Health

Hard Work Has Its Awards

TCoE Trends' Fall 2013 issue took home a Silver Award in the Twenty-Ninth Annual Educational Advertising Awards, a national competition sponsored by the Higher Education Marketing Report.

Writer: Susan Dowd, Graphic Designer: Alicia Post

Ibrahim Baggili has a message for cyber criminals: We're helping your computer cooperate with investigators.

"You're always tracking a person. At the end of the day, you're dealing with a human being who wants to commit a crime, not a computer that wants to commit a crime." That, in a nutshell, is the passion that drives Dr. Ibrahim (Abe) Baggili, one of the leading cyber forensics researchers in the world and an exciting new addition to the faculty in the Tagliatela College of Engineering. To him, it's all about the quest for the human being behind the computer.

The short definition of cyber forensics is scientifically finding digital evidence on computer systems that can be used as legal evidence in court. It is a field that Dr. Baggili gravitated to after earning a bachelor's in network engineering technology and a master's in programming and mobile development at Purdue University. Fascinated by the psychological aspects of cyber forensics after years on the purely technical side of things, he stayed on at Purdue for his doctorate, writing his dissertation on the psychological profiling of cyber criminals and working as a researcher at The Center of Education and Research in Information Assurance and Security (CERIAS) as well as in Purdue's Cyber Forensics Laboratory.

"Today, you profile people by profiling their devices," he explains. Within two months of joining the faculty at UNH, he established a research group here whose mission includes doing exactly that, using the same state-of the-art laboratory equipment and software currently used by industry and government agencies.

Known as the UNH Cyber Forensics Research & Education Group (UNHcFREG), their work focuses on several key areas. Interestingly, job #1 is validating cyber forensics as a science. "A lot of computer scientists believe it's not a science, that we're just applying techniques that already exist," Baggili observes. "But it is a science. We're very methodological in what we do, and we're published in high-impact, peer-reviewed journals. We're solving real-world problems with existing knowledge, but we're still using the scientific method to do that."

The group will be getting first-rate experience with those real-world problems when they start working with the U.S. Department of Defense. Thanks to a partnership agreement with the department's Defense Cyber Crime Center, Air Force Office of Special Investigations — a coup pulled off by Baggili as Director of UNHcFREG — students will be able to engage in remote internships with the agency. The partnership also will allow the College, through its programs in Computer Science and IT, to focus on becoming designated as a National Center of Digital Forensic Academic Excellence by the agency.

Small-scale digital devices is another area of intense interest to Baggili and his group. "Mobile phones intrigue me because they change so frequently," he says. Before coming to UNH, Baggili had done groundbreaking work during a stint on the faculty at Zayed University in Abu Dhabi, where he started the first cyber forensics research lab in the Arab world. There, he and his students were one of the first groups to publish how to analyze an iPhone through iTunes, which backs up the iPhone.

Recently, Baggili and students Jason Moore, Mohammed Al Saif, and Aatefeh Masihzadeh wrote a stunning new chapter in the continuing saga of privacy breaches when they discovered security vulnerabilities in two popular mobile device messaging apps — Viber and WhatsApp. They discovered the security bugs through "white hat hacking" — hacking for the good, as Baggili describes it. The bugs showed that certain data sent using the applications could be easily intercepted, allowing anyone who knew what to do to eavesdrop on a user's communications. In the case of Viber, not only was data being sent in an unencrypted way, but it was also being stored on the server in an unencrypted format. The WhatsApp and Viber stories were reported globally in 20 languages as the bugs may have affected 600 million users. Thanks to Baggili and his students, who notified both WhatsApp and Viber immediately about the bugs, the issue was quickly resolved. In recognition of his past and ongoing work, Baggili was named a 2014 UNH University Research Scholar.

The cyber forensics scenario that the layperson most often reads about, though, is when investigators seize a suspected criminal's home computer and remove the hard-drive for analysis. Most people don't realize how time consuming the process of data retrieval and analysis is. "Analyzing a hard-drive is like going into a house with thousands of rooms because a hard-drive has thousands of gigabytes of data," Baggili explains. "First, we have to make a copy of what's on the hard-drive, but it can take up to 11 hours to copy one terabyte (1000 gigabytes) of data. We can't even begin to sift through and analyze the data until that's done." Analysis can then take months.

That's a challenge that UNHcFREG is meeting head-on. "Can we detect things in real time, even at the scene of a crime? We're developing techniques that will enable us to analyze data while we're copying it off the hard-drive, such as an agent that can be installed on a computer or computer system to collect forensically important digital evidence," he says.

Exactly what types of data can investigators uncover? Web browsing history is what immediately comes to mind for most people, but that's just a small part of an area known as forensic artifacts. "Applications, software, systems… they all leave things behind," Baggili notes. "If you install SKYPE, does it leave your chat log behind? Or Facebook — what data does it leave that can be used for evidentiary purposes?

"Beyond that, can we profile you as a person from your hard drive?" Using Natural Language Processing techniques, we can look at the text on your computer — that is, text in Word documents, in applications, and web history. We then take those words and try to figure out what kind of person you are from them.

Although, cyber crimes include cyber bullying, cyber stalking, identify theft via websites, hacking, sexual predation or sexual exploitation using the Internet, Phishing, Spamming, Spyware, and Malware, Baggili stresses that cyber forensics applies to non-computer-related crimes as well. If a criminal simply uses a computer, a whole profile of the person can be put together by analyzing what's on it.

For criminals — cyber or otherwise — there's a simple, one-word translation for that: Busted.

CONFERENCE

Dr. Baggili will chair the 6th International Conference on Digital Forensics & Cyber Crime, which will run jointly with Systematic Approaches to Digital Forensic Engineering, on September 18, 19, and 20 in New Haven, Connecticut at the Omni Hotel.

This will be a gathering of the top cyber forensic scientists from around the world, with only the most innovative ideas in the cyber forensics domain accepted. To submit a paper or to register, visit: d-forensics.org

Mega-Merger: The Coming Together of Engineering and the Entrepreneurial Mindset

A new internship program at UNH's Orange Campus has engineering students thinking of start-up companies and market forces.

Trend Spotting. Market Analysis. Entrepreneurship. Those are just some of the terms commonly associated with business majors that have now taken up residence in the minds of electrical engineering and computer science interns engaged in an innovative new program at the University's stunning new campus in Orange, Connecticut.

The program — called Engineer-Entrepreneur-in-Residence (E^2iR) — is a collaborative effort between the University of New Haven and a rapidly growing start-up in Avon, Connecticut called iDevices, which creates sophisticated applications for mobile devices. Lending an assist is a grant from Connecticut Innovation's CTNext initiative. Connecticut Innovations was formed by the Connecticut State Legislature and provides financing and ongoing support for start-ups and entrepreneurs. "There continues to be a strong demand for engineering talent in the state," said Claire Leonardi, CEO of Connecticut Innovations. "We set out to develop and nurture that talent, create jobs, and provide students with a real-world experience that shows them the excitement that is generated in an entrepreneurial setting."

The CTNext proposal was conceived and authored by Christopher Martinez, assistant professor of electrical and computer engineering, Dean Ron Harichandran, and Chris Allen, CEO of iDevices.

Fully invested in the new approach to engineering education, which asserts that a strong technical education alone is not enough to succeed in 21st century engineering careers, the E^2iR program aims to teach the types of skills not usually related to engineering — in this case, how to think like an entrepreneur. The students will get exceptional exposure to that mindset at iDevices. Dr. Martinez, who is coordinating the UNH interns, enthused, "Working with iDevices is a good opportunity for these students. And, since the area of mobile device apps is up and coming, it's also a way for them to get their foot in the door."

Looks matter

Once a week, an engineer-entrepreneur from iDevices heads to campus after work to open the minds of these future engineers to the issues that matter beyond the technical aspects of a mobile device app — in other words, beyond just getting the thing to work. What about its appearance, for instance? Is it going to be attractive to the user? Does the way the screen switches from one menu to the next look well thought-out? It has been something of a revelation to the students, since physical attractiveness is traditionally not top-of-mind for engineers — or even bottom.

"They're getting an education in how a user uses these devices," said Martinez. "When they go to a job interview, they'll be able to bring that up

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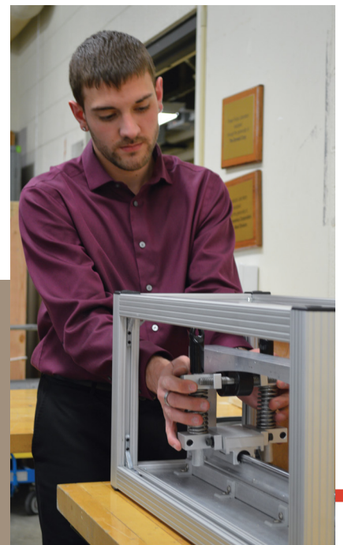

A More Power-Packed Internship Program with Sikorsky

The Sikorsky Engineer-in-Residence program has evolved into an exciting new model, redesigned to give students a greater jumpstart in launching a career. The program, which formerly resided in Room B101 in Buckman Hall, has become the UNH-Sikorsky Aircraft Engineering Internship Program and is now on-site at the Sikorsky campus in Stratford.

These are no ordinary internships, though, which typically span a summer or a semester. They are intensive, year-long relationships — a company partnership, in effect.

The goal of the former Engineer-in-Residence program had been to give students practical experience to complement their technical education by learning first-hand from professionals. In that way, they would be better able to make immediate contributions when they entered the workforce.

The redesigned internships with Sikorsky will ramp up that experiential learning, giving students a depth and breadth of real-world knowledge and experience in aircraft engineering that is rare. Graduates will hit the job market with a decided and enviable edge — in the job search itself and from their first day at work.

University of New Haven

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The Tagliatela College of Engineering has been ranked in the top-tier of undergraduate engineering programs nationwide by **U.S. NEWS & WORLD REPORT**.

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SAVE THE DATE — 2nd Annual TCoE Alumni Dinner

October 17, 2014

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and show that they're thinking beyond their small area of programming. It's something that will distinguish them from students graduating from other universities."

Meanwhile, in month-long workshops, the students are learning how to program tablets and iPhones. In the fall, the entrepreneurial aspect is slated to start in earnest and will give the students insight into a more exciting career scenario than they might have envisioned. CEO Chris Allen commented, "We're aiming to provide students with a direct bridge from higher education to the professional world. We believe this program will help them start careers for which they have a real passion and desire."

A packed house

Humming along beside the internship program — which involves 3 juniors and a sophomore — is a senior design project in full swing, with iDevices providing the technological support. Unlike most senior design projects, which typically are determined by the sponsoring company, the students came up with the idea for the project themselves. They are collaborating with the Athletics Department on this one, which involves designing and developing a mobile app that will allow UNH alumni to attend football games virtually.

Sikorsky blazed the engineer-in-residence trail at UNH

iDevices is following in the footsteps of a giant when it comes to engineers-in-residence at UNH. Sikorsky, the Stratford, Connecticut-based helicopter manufacturer, opened its Engineer-in-Residence program on the UNH campus in 2009. Students worked on actual projects underway at Sikorsky and received a salary as part-time employees. Although the Sikorsky Engineer-in-Residence program has closed on campus, the UNH partnership with the company is as strong as ever — students are now working directly with engineers at the Sikorsky plant itself in year-long internships through the UNH-Sikorsky Aircraft Engineering Internship program.

The Extended Forecast

One thing is certain about the collaboration with iDevices — it's giving these interns not only a depth and range of experience far beyond the norm, but it's also putting them on the leading edge of the next generation of Connecticut entrepreneurs. "You can see a spark in the students," said Martinez. "This is something they know is different from what they've done in class. Something they know they are going to be able to use."

Prediction? Look for a fresh wave of engineering start-ups in a few years.

Want to join us?

The Tagliatela College of Engineering is seeking other industry partners to participate in the E²iR program. UNH's new Orange Campus provides an ideal — as well as idyllic — setting for corporate partners to work with students. Interested companies should contact Dean Ron Harichandran at rharichandran@newhaven.edu