

SCHOOL OF ENGINEERING UPDATE

FAIRFIELD UNIVERSITY | SPRING 2020



Message from the Dean



“I am proud of the work we have accomplished to lay the foundation and define the path for our future.”

Since this is my final *Message From the Dean*, I thought I would take a moment to share some of the major accomplishments of the Fairfield University School of Engineering over the last 20 months. I am proud of the work we have accomplished to lay the foundation and define the path for our future. To begin with:

- The School of Engineering was chosen by the University as one of four strategic priorities for growth over the next five to eight years; as such, we created and set in motion a six-year strategic vision for its growth.
- We hired new faculty with applied research interests to support the School's strategic vision and to grow our industry-aligned collaborations.
- We acquired additional space that will become the SOE Innovation Center and will house advanced research labs, industry-aligned collaboration space, and a makerspace for students.
- The *US News & World Report* ranking of national master's degree-granting institutions moved the School of Engineering up to No. 75 (out of 210) in 2020, a 28-place jump from 2018.
- Our undergraduate enrollment is steadily growing; the incoming freshman class for fall 2018 was 88, for fall 2019 it was 114, and our goal for fall of 2020 is 130 new and transfer students.
- At the graduate level, we will launch our new MS in Cybersecurity program in fall 2020, in response to the exploding regional and national need for cyber-specialists. Our new cybersecurity laboratory will provide an opportunity to offer cybersecurity certification programs for professionals from business, education, and industry sectors.
- We celebrated our 25th Anniversary at Fairfield University with events including a cybersecurity panel discussion, the first-ever *TEDxFairfieldUniversity* program, and a lecture by MIT Professor Robert Langer.
- We celebrated National Engineers Week with a theme “Industry 4.0: The Fourth Industrial Revolution,” featuring a keynote address by Dr. Mark Maybury, Chief Technology Officer, Stanley, Black and Decker.

I could easily add more, but I think you get the idea that we are on the move and will become a significant presence at the University as our academic reputation continues to grow. It has been a pleasure and a privilege serving as dean, and I look forward to learning of the School's continued successes in the future.

Sincerely,

RICHARD H. HEIST, PhD
Dean

ON THE COVER:

Bioengineering major Lilliana Delmonico '20 presents at *TEDxFairfieldUniversity*.

Photo by Andrew Henderson

INSET: The *TEDxFairfieldUniversity* stage was set with a theme of “Innovation and Inspiration.”

Photo by Jeannine (Carolan) Graf '87

SCHOOL OF ENGINEERING UPDATE

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UNDERGRADUATE PROGRAMS

B.S. in Bioengineering
B.S. in Computer Science
B.S. in Electrical Engineering
B.S. in Mechanical Engineering

STUDENT ORGANIZATIONS AND SOCIETIES

3D Printing Club
American Society of Mechanical Engineers (ASME)
Biomedical Engineering Society (BMES)
Engineers Without Borders (EWB)
Engineering Student Society (ESS)
Institute of Electrical and Electronics Engineers (IEEE)
National Society of Black Engineers (NSBE)
Society of Automotive Engineers (SAE)
Society of Women Engineers (SWE)
Tau Beta Phi (Engineering Honor Society)



STUDENT ACCOMPLISHMENTS

2019-20 Inductees to Tau Beta Phi, Fairfield's Engineering Honor Society

CLASS OF 2020

Ronald Chasse (CE)
Eric Connolly (SE)
Lilliana Delmonico (BE)
Connor Hehn (BE)
Joshua Heilweil (EE)
Harold Corey Loke (ME)
Jennifer McCann (ME)
Jacob Musto (EE)
Prathna Pel (CS)
Daniel Valli (CE)
Han Bin Yoo (ME)

CLASS OF 2021

Nicolas Black (ME)
Kevin Bodell (ME)
Cesar Gavilano (ME)
Hemant Maheshwari (CS)
Anne Nebbia (ME)
Phuc Nguyen (ME)
Meghan Stevens (BE)
Kathryn Stringer (BE)
Ryan Toner (CS)

NASA CT Space Grant Awardees, Fall 2019

Mitchell Owen
Keith McHugh

2019-20 BEI Scholarship

Thomas Botelho
Colin Bradley
Stephanie Brij-Raj
Amy Caplan
Ronald Chasse
Lilliana Delmonico
Jimmy Diaz
Kylie Duncan
Matthew Flores
Trevor Gasperatti
Cesar Gavilano
Konstantinos Georgiadis
Emmett Godfrey
Stephen Gosselin
Brian Gozzo
Connor Hehn
Eric Jiang
Spencer Letizia
Harold Corey Loke
Dean Martel
Jennifer McCann
Keith McHugh
Phuc Nguyen
Mitchell Owen
Prathna Pel
Todd Richards
Hailey Spinella
Sebastian Useche Rosania
Daniel Valli
Peter Wihbey
Matthew Willins
Han Bin Yoo

2019-20 Bernadette and John Porter Scholarship

Allison Beesley
Julian Cano Angel
Anthony Chiapetta
Albert Cortina
Rosanna Corvino-Rosa
Nimesh Das
Alex DiMaio
Michael DiMasi
Nicholas Festa
Michael Foster
Charles Golden
Benjamin Gonzalez
Naga Vydehi Gurram
Uyen Thy Ho
Christopher Holtzman
Zachary Kaplan
Thuy Le
Danial Liashek
Serena Lo
Thomas Marrinan
Sakshi Mathur
Mayara Miranda
Mark Mozdzer
Samuel Nguyen
Mohanapriya Nithiyanthan
Sukumar
Srinivasan Obla Jawaharlal
Emre Ozbalta
Sai Teja Paladugu
Esai Varuni Rajapandi
Masruk Siddique
Hung Il Davi Squizzato

Reginald St. Juste
Matthew Trusch
Howard Wells
Aaron White
Yanbei Xie
Kaci Zamoum

Martha Rogers BEI Scholarship

Justin Chi
Samantha Fortune
Alexander Freedman
Varshith Guthikonda
Sailesh Kumar
Nicholas Jensen
Kyle Klashka
Tristin O'Connor

Alexis Zaveruha BEI Scholarship

Sarah Bowman
John Callanan
Ashley Halmans
John Moriarty

Society of American Military Engineers (SAME) Scholarship

Amy L. Caplan

GRADUATE PROGRAMS

Master of Science programs at Fairfield University's School of Engineering provide the educational foundation engineers need to build a dream career. Skilled faculty teaches how to better understand complex engineering issues within a global context, offering students the knowledge and confidence needed to solve the world's engineering problems.

Applied Data Science

Electrical and Computer Engineering

Management of Technology

Mechanical Engineering

Software Engineering

CERTIFICATE PROGRAMS

Cybersecurity

Data Science and Big Data Technology

Network Technology

Web and Mobile Application Development

LEFT: Top (l-r), Dean Martel '21, Samuel Santos '22, Phuc Nguyen '21, and Andrew Jobson '20 demonstrated 3-D printer capabilities during National Engineers Week.

Photo by Nicolette Massaro

Bottom, Fairfield Students enjoy an autumn walk to class.

Photo by University Media Center



“The Techstars Startup event was a wonderful experience. We got to learn a lot about how to build a startup, and we met many mentors and advisors.”

Pawan Pillai

SOFTWARE ENGINEERING GRAD STUDENTS TAKE TOP PRIZE AT TECHSTARS STARTUP WEEKEND

Four Fairfield University graduate students in the Software Engineering program won first place for their Plant Wiki app during September’s Techstars Startup Weekend in Stamford.

Techstars Startup Weekends, in partnership with Google for Startups, are run by local organizers in more than 700 cities and 150 countries around the world. The event that took place in Stamford, Conn. last September immersed a group of graduate students from Fairfield’s Software Engineering program in a startup environment that felt more like a 54-hour crash course in how to create a product, launch a business, and connect with experienced mentors and potential investors.

The weekend began for Fairfield grad students Pawan Pillai, Serena Lo, Thuy Le, and Yanbei Xie with Friday night idea pitches, during which they met and joined forces with three additional weekend participants, Theodoros Koutsoukis, Kofi Osei, and Brahma Sen.

Together, the group spent the next two days creating their Plant Wiki app, testing it, and developing a business model. The weekend culminated on Sunday night with a demonstration before a panel of judges comprised of potential investors and local entrepreneurs.

If it’s true, as the Techstars website claims, that “the hardest part of starting up is starting out,” the co-creators of the Plant Wiki App did not just slog through the hard part – they sailed to a first-place finish and \$300 cash prize.

The group’s prizewinning product, Plant Wiki, is a smartphone app that targets urban populations to assist with their gardening needs. The innovative app focuses on three

primary areas: (1) plant identification and gardening tips, (2) a discussion board, and (3) an in-app marketplace.

According to team member Pawan Pillai, “There are many plant and gardening apps in various app stores, but most of them are either not good or are paid or subscription-based,” which is not conducive to long-term use.

What sets Plant Wiki apart is that the app combines the best features of all competitors’ apps, and offers them at no charge. Said Pillai, “By keeping the app free to use for the end consumer, we hope to gain a large user base. At the same time, we plan to build a marketplace within the app where small and big-box sellers can sell their products directly to app users.” Revenue generated from a small commission on each sale within the app will help to keep the app free for users.

The Plant Wiki app will initially rely on 3rd party sources for plant and soil information, but the developers hope to eventually build a large dataset that can be mined for knowledge and marketplace recommendations. “The end goal,” explained Pillai, “is to build a community of plant lovers who may learn new things about gardening, share their gardening knowledge with each other, and make use of Plant Wiki’s in-app marketplace for all their gardening needs.”

Energized by his fellow entrepreneurs and ready to grow Plant Wiki to the next level, Pillai said, “The Techstars Startup event was a wonderful experience. We got to learn a lot about how to build a startup, and we met many mentors and advisors.”



ABOVE: (l-r) Plant Wiki team members: Yanbei Xie, Pawan Pillai, Serena Lo, and Thuy Le.

Photo contributed by Pawan Pillai



FAIRFIELD MARKS NATIONAL ENGINEERS WEEK WITH THEME OF

INDUSTRY 4.0: THE FOURTH INDUSTRIAL REVOLUTION

Thanks to rapid advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, and other technologies, the world is in midst of a revolution that is causing both material and ideological changes to the way we live, work, and relate to one another. In his 2016 book, *The Fourth Industrial Revolution*, Klaus Schwab, founder and executive chairman of the World Economic Forum, described this era of progress (also known as 4IR or Industry 4.0) as one that is “blurring the lines between the physical, digital, and biological spheres.”

With a theme of “Industry 4.0: The Fourth Industrial Revolution,” Fairfield’s student engineering clubs recognized and celebrated the dizzying pace of today’s technological advances with a schedule of demonstrations, professional development forums, and service activities from February 16 to 21, during National Engineers Week 2020.

The week kicked off with a keynote address by Mark Maybury, PhD, chief technology officer of Stanley Black & Decker. Dr. Maybury’s presentation focused on the opportunities and challenges of deploying artificial intelligence at scale at Stanley Black & Decker, a \$14 billion diversified industrial company with a 176-year legacy of industrial excellence founded on socially responsible innovation.

With more than 60,000 employees worldwide, Stanley Black & Decker manufactures a half million products in 60 countries. Dr. Maybury shared examples of how the company’s products increasingly leverage artificial intelligence, for example,

to anticipate falls from gait analysis, perform audio event understanding to enhance security, or to provide intelligent health care companionship to enable aging in place.

He also described how the deployment of artificial intelligence at Stanley Black & Decker’s 100+ global facilities enhances the effectiveness of supply chains, and the manufacturing and distribution of its world-first products.

Other Engineers Week highlights included student-run club activities such as the National Society of Black Engineers’ tribute to engineers of color who have paved the way for and contributed to Industry 4.0, a DIY event sponsored by members of the Institute of Electrical and Electronics Engineers, and an exploration of South American culture with Engineers Without Borders.

Students in the Society of Women Engineers club used an interactive LEGO display to demonstrate to a group of visiting high school students how soft skills – teamwork, communication, adaptability, and problem-solving – interplay with engineering and Industry 4.0 processes.

The Biomedical Engineering Society also invited the high schoolers to check out a fully engineered, interactive “Frankenstein” body, complete with detailed models of body parts and internal organs. They even invited the up-and-coming engineers to design their own body parts.

By the end of Engineers Week, the School of Engineering had successfully started a campuswide conversation on how Industry 4.0 is reshaping our culture, our social interactions, our work – and how it is challenging our notions about what it means to be human. **6**



Innovation & Inspiration

at TEDxFairfieldUniversity

If you've ever watched a great TED or TEDx talk online, you're probably familiar with that "aha" feeling of suddenly seeing a topic or idea in a fresh new, interesting way. That's what it felt like to be a part of the first-ever live TEDxFairfieldUniversity event, held this past fall in the Regina A. Quick Center for the Arts.

The acronym TED stands for Technology, Entertainment, and Design – the three topics that combined in 1984 to form the first TED Talk in Monterey, Calif. Today, the nonprofit TED organization shares "ideas worth spreading," not only through the renowned annual TED Talk conference, but also through TEDx – a program launched in 2009 as a smaller, more intimate venue for local communities to share big, TED-worthy ideas. Last year, there were more than 3,600 TEDx events around the world.

Among the nine speakers selected were alumna Dawne Ware '89, CEO of Ware Consulting LLC and a finance and operations executive in the property casualty and reinsurance industries, who had a message about doing the right thing – even when no one is looking; David Banks, president and CEO of The Eagle Academy Foundation,

Inc., whose visionary approach to the education of young men of color has been featured on CBS This Morning; and Cindi Bigelow H'16, third-generation CEO of U.S. market leader Bigelow Tea, whose parents had a front-row seat as she passed along important life lessons learned from her predecessor and father.

The wife and children of Mark Unger, author and owner of another family business, Unger Global Companies, also had front-row seats for his moving TEDx talk, "First Survivor," about confronting – and rejecting – the prognosis of "zero chance of survival" when his son was diagnosed with childhood cancer.

Having served three U.S. Army tours as a trauma surgeon in Afghanistan and Iraq, Dr. T. Sloane Guy, MD, MBA, brought a unique perspective to his TEDx talk, "Innovation Inspired by Adversity: Robotic Surgery's Third Wave."

Dr. Guy, who today works as a surgeon, professor, and director of Minimally Invasive & Robotic Cardiac Surgery at Sidney Kimmel Medical College of Thomas Jefferson University Hospital in Philadelphia, described how the established medical profession first renounced the young doctors pioneering minimally invasive surgical


techniques in 1989. Today, their innovation is now widely considered to be "the most revolutionary medical procedure in 100 years." Summing up his vocation to teach, perform, and advance the science of minimally invasive robotic surgery, Dr. Guy shared a quote from Elon Musk: "I could either watch it happen or be a part of it."

Cybersecurity expert Aidan Kehoe, co-founder and CEO of Skout Cybersecurity challenged young leaders in business and the community to "change the world by caring about it more every day," in his TEDx talk, titled "Feeling Safe in Scary Times." To the great interest of the engineering students in the audience, he estimated that there are currently 3 million open jobs in cybersecurity worldwide – almost a half million of them in the U.S.

From a wide range of vocations and backgrounds, all of the invited speakers shared one important asset: an idea that would inspire debate and spark conversation. For bioengineering major Lilliana Delmonico '20, it was a thought-provoking twist on how to handle the expectations of others when asked, "What do you want to do with the rest of your life?"

For Donna Coletti, MD, MS, FACOG, scholar-in-residence at the Kanarek Center for Palliative Care in Fairfield's Marion Peckham Egan School of Nursing and Health Sciences, it was the personal story behind her unlikely professional career path from obstetrics and gynecology to palliative and hospice care.

For Stephen Badylak, DVM, PhD, MD, deputy director of the McGowan Institute for Regenerative Medicine at the University of Pittsburgh, it was the idea that innovation and inspiration are "typically borne out of an unmet need."

In the field of regenerative medicine, which Dr. Badylak defined as "trying to replace missing or injured body parts with functional tissue," he noted that every innovative step forward comes with mistakes and identified limitations that then supply the next unmet need. "The way we're going to continue forward," he said, "is by continuing to be inspired by our limitations." 



Watch and share the TEDxFairfieldUniversity talks at: fairfield.edu/tedxfairfielduniversity

ABOVE: Seven of the nine presenters (l-r): Lilliana DelMonico '20; Stephen Badylak, DVM, PhD, MD; Dawne Ware '89; Mark Unger; Aidan Kehoe; Donna Coletti, MD, MS, FACOG; and Cindi Bigelow H'16.

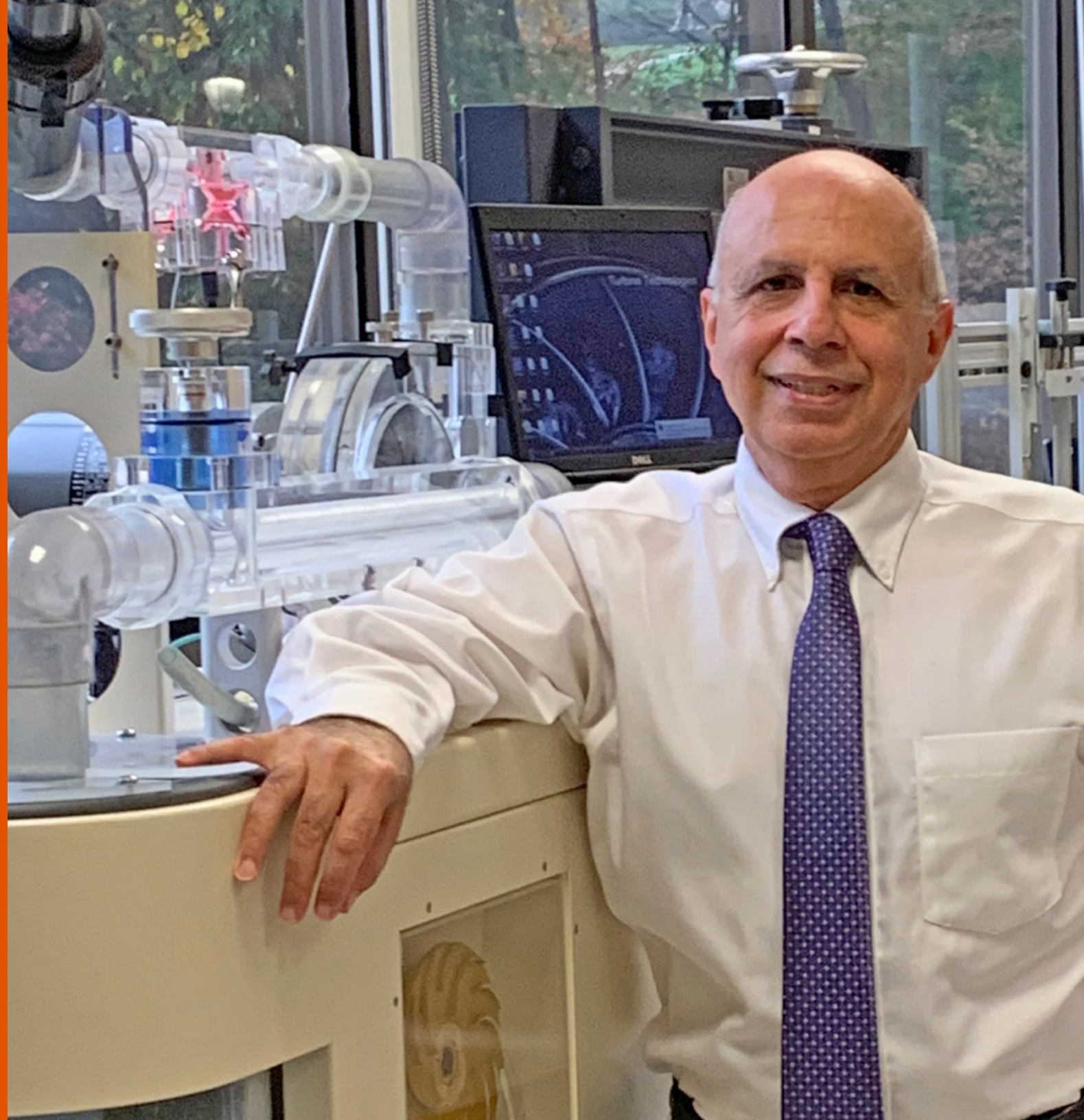
LEFT: Top, Skout Cybersecurity CEO Aidan Kehoe discusses "Feeling Safe in Scary Times." Bottom, Cindi Bigelow H'16 shares her "Lessons Learned From My Father."

Photos by Andrew Henderson

SHAHROKH ETEMAD, PHD, CELEBRATES A DECADE AT FAIRFIELD WITH A PAIR OF NATIONAL RECOGNITIONS

“I am a believer in life-long learning. I hope these awards will set an example for junior faculty that a PhD degree should not be their last milestone.”

Shahrokh Etemad, PhD
Chair of Mechanical Engineering



As he celebrates a decade of service to Fairfield University, Professor Shahrokh Etemad, PhD, is on a roll. For starters, he was named a fellow of the American Society of Mechanical Engineers (ASME) in October. “Being a fellow of ASME is a unique and prestigious honor,” said School of Engineering Dean Richard Heist, PhD, “since fellows comprise only about 3.5% of the ASME membership.”

Dr. Etemad has been an ASME member since 1995, and said the Society has been a valuable resource for learning about leading-edge technology and for exchanging information with colleagues from other institutions and research centers. “The field of mechanical engineering was already big,” he said, “and is now getting bigger. Renewable energies such as solar and wind are now on our roof and in our backyard. New fields of advanced manufacturing and industrial automation are part of the fabrication process; robotics have penetrated into the medical and advanced electronics field. Composite materials and nano-materials are replacing the traditional materials on vehicle, aerospace, and household equipment. New autonomous vehicles are taking off.”

The following month, Dr. Etemad was inducted into Tau Beta Pi, the nation’s second-oldest honor society (established in 1885) and the only one to represent the entire engineering profession. In addition to distinguished scholarship, field achievements, and exemplary character, Dean Heist noted that Tau Beta Pi seeks members who “foster a spirit of liberal culture in engineering colleges.”

Dr. Etemad is a big proponent of student and faculty involvement in honor societies and technical societies like ASME, as a way to enrich classroom learning, gain leadership experience, and stay on top of fast-changing engineering fields. “I am a believer in life-long learning,”

he said. “I hope these awards will set an example for junior faculty that a PhD degree should not be their last milestone.”

Prior to becoming a full-time School of Engineering faculty member in 2010, Dr. Etemad worked at research divisions of Honeywell-Textron, Carrier-United Technologies, and Precision Combustion, Inc. He has published 40 technical articles and has been awarded 29 patents.

When asked to compare today’s field of mechanical engineering to the one he studied as an undergraduate, Dr. Etemad pointed out that the equations haven’t changed since his days as a student engineer, but technology has made the learning process and execution “an order of magnitude quicker.”

“As a result,” he said, “I expect our students today to be more productive and deliver a faster turnaround.”

Beyond the classroom, Dr. Etemad’s expectations for School of Engineering graduates remain high. “I anticipate our students moving up the organizational ladder quickly when they leave Fairfield University. I always tell them if they pursue higher education, they should target a master’s degree within a year to a year and a half, and a PhD within four years. For those pursuing industrial careers, I encourage them to set their sights on the title of Senior Engineer within five years.”

LEFT: Professor Shahrokh Etemad, PhD, chair of Mechanical Engineering, is celebrating his 10th anniversary at Fairfield University.

Photo by Jeannine (Carolyn) Graf '87

ENTREPRENEURIAL ENGINEERS

Lynders' idea for the AutoDolly sprang from witnessing the time-consuming challenges that filmmakers encounter when setting up equipment between scenes. The product uses technology that replaces the need to physically move equipment between shots, which he hopes will save independent filmmakers both time and money.

RIGHT: Mentor Jeffrey Hendrickson With Team AutoDolly: Mike Lynders '19, Parth Bhavsar, Kacper Laska '18, and Matt Fanelli '20.

Photos by Mike Budny.

At Fairfield's School of Engineering, students learn that to become competent engineers, they need to be willing to take risks, solve complex problems, and navigate around difficult situations when they arise. Judging from their success at the Charles F. Dolan School of Business's annual Fairfield StartUp Showcase, student engineers are also finding out that these skills translate well in the competitive world of business entrepreneurship.

Now entering its ninth year, the Fairfield StartUp Showcase is the University's entrepreneurship competition where teams of students present their ideas, make business pitches to a panel of investors, and compete for seed money in front of a live audience.

Before making it into the *Shark Tank*-style competition, selected StartUp teams go through a year-long sequence of educational, networking, and mentoring events designed to help them ideate and articulate their business models in order to attract partners to help them launch their businesses.

With an idea to use his engineering and robotics background to create a more accessible platform for delivering camera movements on movie and television sets, electrical engineering major Michael Lynders '19 teamed up with partners Matt Fanelli '20 and graduate students Parth Bhavsar M'19 and Kacper Laska '18, M'19 to enter last spring's competition. Using a grant from the

CT Innovation organization, they built a prototype of Lynders' concept, the AutoDolly.

The AutoDolly is a mobile camera tripod with tilting and vertical axes that applies collaborative robotics to enable operators to provide smooth cinematic motions. Its groundbreaking technology uses three specially designed wheel modules and sensors that allow it to glide in any direction and turn on a dime.

Lynders' idea for the AutoDolly sprang from witnessing the time-consuming challenges that filmmakers encounter when setting up equipment between scenes. The product uses technology that replaces the need to physically move equipment between shots, which he hopes will save independent filmmakers both time and money. Said Lynders, "On stage, time is money. Production value increases with more shots per day. With fewer hours spent on stage, money can be saved on set wages and other expenses."

At the end of the StartUp Showcase competition, the AutoDolly team was awarded first place and \$10,000 in seed money, plus an additional \$1,000 after being voted the audience favorite. They plan to put the funding toward building a fully-functioning device and expanding their marketing team. Their StartUp Showcase experience has taught them that in both engineering and entrepreneurship, it pays to wisely assess risks and challenges, and – like the AutoDolly itself – pivot when necessary. [S](#)



SENIOR DESIGN PROJECTS SPRING 2020

TEAM 1 Proprietary Time-Shift Genetic Algorithm Framework Replacement

Advisors: Dr. Adrian Rusu and James Ritchie (FAA)

Prathna Pel (S), Mitchell Owen (MS), Andrew Jobson (C) Alexandru Rusu-Sprincenatu (S)

Team 1 is working with the FAA on new paradigms to increase air traffic safety by aiding in the process of simulating conflicts with recorded flight data using Jenetics, an open source Java-based genetic algorithm framework.

TEAM 2 Reticle Handler Simulation Package

Advisor: Dr. Adrian Rusu and Steve Lindeberg (ASML)

Matthew Flores (S), Spencer Letizia (S), Daniel Valli (C), Alexander Freedman (S)

Team 2 is working with ASML to create a Reticle Simulation program for inside a lithography system. The simulator projects an animated reticle flow as it moves between stations, to detect errors and reduce human time consumption.

TEAM 3 Articulating Mount for Portable Ultrasound Probe

Advisor: Dr. Susan Freudzon

Amy Caplan (B), Connor Hehn (B), Natalia Velasquez Jurado (B), Brian Gozzo (M), Peter Wihbey (M)

Team 3 will design an articulating mount to secure a mobile device to a portable ultrasound probe so clinicians can use both hands to perform procedures while simultaneously viewing images from a wide range of angles and positions.

(B)=Bioengineering, (C)=Computer Engineering, (E)=Electrical Engineering, (M)=Mechanical Engineering, (S)=Software Engineering or Computer Science

TEAM 4 Electric Motorcycle

Advisor: Dr. Jeffrey Denenberg

Bach Nguyen (M,S), Nicholas Jensen (C), Alex Baker (C), Liam Seymour (E)

Using renewable and clean energy, Team 4 will build an electric motorcycle with a more efficient and reliable lithium phosphate battery system, complete with a charger and battery management system (BMS) and a cooling system.

TEAM 5 Needle Protection Device

Advisor: Dr. Medhi Safari

Samantha Fortune (M), Jennifer McCann (M), Sarah Bowman (M), Jimmy Diaz (M)

Team 5 is working with Achaemenid LLC (a medical device startup) to design a working prototype of a needle protection device that will provide a safe and effective way to remove dental hypodermic needles from the syringe assembly.

TEAM 6 Smart Plug for Air-Conditioning Appliances

Advisor: Dr. Uma Balaji

Jacob Musto (E), Richard Dalton (E), Stephen Gosselin (E), Colin Krug (E)

Team 6 will combat energy overconsumption and enable consumers to make more mindful decisions regarding their energy usage, by placing a device between an outlet and an appliance to provide real-time energy consumption data.

TEAM 7 Integration of an Automated Jewelry Unpacking Method in Production

Advisors: Dr. Michael Zabinski and Karim Kharbouch (Biometrics NLE)

Trevor Gasperetti (M), Matthew Willins (M),

Bradley Colin (M), Sebastian Useche Rosania (M)

Team 7 will design and construct a system that unpacks small charms from individual bags and separates them from all of the plastic debris without any harm to the charms.

TEAM 8 Develop Educational Heat Transfer Experiment for Integration Into the BSME

Advisor: Dr. Shahrokh Etamad

Justin Chi (M), Nicholas Junquet (M), Quinn Rozanitis (M), Lorenzo Giordani (M)

The project being undertaken by Team 8 will develop an educational convective heat-transfer experiment to integrate into the undergraduate mechanical engineering lab curriculum.

TEAM 9 Device to Convert Plastic Bottles Into Household Objects

Advisor: Dr. Sriharsha Sundarram

Tristin O'Connor (M), Shawn Hall (M), Eric Jiang (M), Keith McHugh (M)

The focus of Team 9's project is to build a system that will enable users to recycle and re-manufacture plastic water bottles into objects for household use. The system will be a benchtop device and will run off battery power.

TEAM 10 Pellicle Uniformity Corrector

Advisor: Dr. Andrew Judge (ASML)

Thomas Botelho (M), Han Bin Yoo (M), Konstantinos Georgiadis (M), Carlos Murcia (M)

After researching pellicle materials and thicknesses, Team 10 will innovate a new

concept for sag reduction, develop "first order" equations, analyze predicted behavior, and build a prototype system on which to perform testing analytics.

TEAM 11 Passive Damping Multiplier

Advisor: Dr. Andrew Judge (ASML)

Robert Gonfiantini (M), John Callanan (M), Emmett Godfrey (M), Turutana Teakaata (M)

Team 11 will create a device to oppose and damp a wide range of unwanted vibratory movement using Eddy Currents to help dissipate energy within a system, combined with a travel multiplier for added efficiency.

TEAM 12 Temporally and Spatially Encoded Optical Imaging

Advisors: Dr. Ryan Munden and Dr. Michal Pawlowski (ASML)

Lilliana Delmonico (B), John Moriarty (S), Ronald Chasse (C), Harold Loke (M)

Team 12's project enables imaging of 3-dimensional objects on varied surfaces, to determine position and height of objects through Fourier analysis of the resulting image.

TEAM 13 Fabrication of a MALDI Matrix Sprayer

Advisors: Dr. Isaac Macwan and Dr. Jillian Smith-Carpenter (Department of Chemistry and Biochemistry)

Ashley Halmans (M,B), Kylie Duncan (B), Kyle Klaschka (B), Yen Linh Le (B), Dean Martel (B)

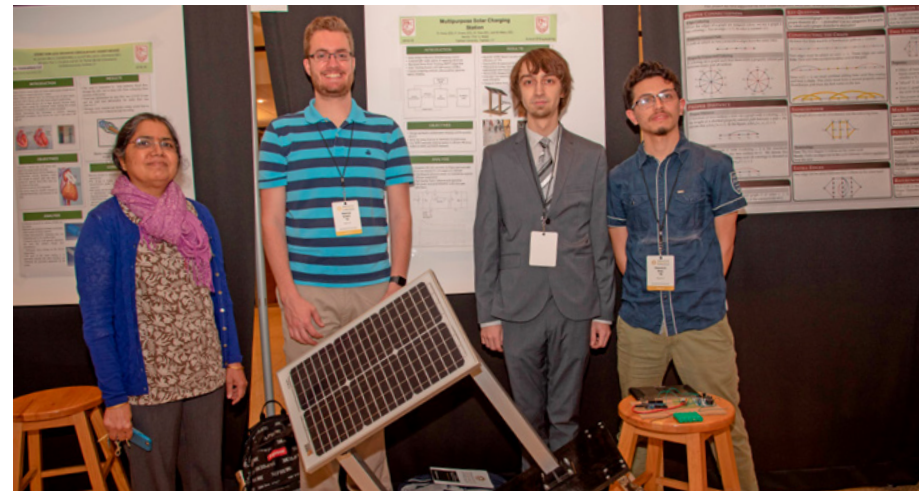
Team 13 is building a sublimation chamber to have smooth matrix deposition for Matrix-Assisted Laser Desorption/Ionization - Time of Flight (MALDI - TOF) equipment, to enable gathering of molecular tissue images.

SCHOOL OF ENGINEERING FAST FACTS

<p>12:1</p> <p>Undergraduate student-to-professor ratio</p>	<p>100%</p> <p>Engineering students with at least one internship*</p>	<p>37%</p> <p>Engineering students with two or more internships*</p>
<p>100%</p> <p>Placement Rate</p> <p>six months after graduation</p>	<p>82% employed</p> <p>+</p> <p>16% full-time graduate program enrollment</p> <p>+</p> <p>2% full-time service program</p>	<p>\$67,499</p> <p>Median starting salary for Fairfield University SOE graduates</p>

*Based on respondents to Class of 2019 survey

A SAMPLING OF COMPANIES THAT HIRE FAIRFIELD SOE GRADUATES



(l-r) Associate Professor Uma Balaji, PhD, and her advisees Patrick Evans '19, Max Malcy '19, and Maverick Ruiz '19 presented their multipurpose solar charging station at the 2019 Research Symposium.

Photo by Kate Eisemann

FACULTY DEDICATED TO RESEARCH AND INNOVATION

Uma Balaji

Associate Professor and Chair of Electrical Engineering and Bioengineering

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- RF Power Amplifier
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TOP RIGHT: (l-r) Professor Adrian Rusu, PhD, advises Kristen Olinger '22; students at work in the Bannow Science Center's Materials Lab; Nyomi Holmes '22 in class.

Photos by University Media Center

BACK COVER: Scenes from the School of Engineering's seventh annual Walk on Water competition, in which teams of first-year students design and race hand-made devices across Fairfield's indoor swimming pool, testing the skills they've learned in their "Fundamentals of Engineering" class.

Photo by Giles Ruck '21



VISION

The School of Engineering will be a recognized leader in modern, experiential-based engineering education and known for innovative, applied research that, together, fosters a student-centered and research-focused educational experience that prepares graduates for successful and rewarding careers in service to others.

MISSION

The School of Engineering is dedicated to: (1) Providing transformative educational experiences that prepare our graduates for successful careers; (2) advancing engineering knowledge through applied research; and, (3) supporting the University's mission of whole-person development (cura personalis) by inculcating into our students the service-to-humanity character of the engineering profession.

PURPOSE

We believe a strong, experientially based curriculum, supported by faculty with an applied research focus will lead to:

- Enhanced academic reputation.
- Increased scholarship (i.e., scholarship of application; scholarship of teaching and learning)
- Students, imbued with the service-to-humanity character of the engineering profession, prepared to meet the future challenges of a rapidly evolving, technology-based society.

VALUES

"Our Ethics in Action"

- **Excellence** in all we do
- **Engagement** at every level
- **Innovation** across all disciplines
- **Character** as a foundation of **Leadership**
- **Diversity** and **Inclusion** in all things
- **Service to Humanity** as a lifelong goal



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