



CALIFORNIA STATE UNIVERSITY  
**FULLERTON**<sup>TM</sup>



Pushing the Boundaries  
of Teaching and Research

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In Supporting Promising  
Scholars, an Inspiring  
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Receive Transportation  
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Dr. Nina Robson works with a student to develop technology that assists people with neurological disorders.

# CONNECTION

NEWS FROM THE COLLEGE  
OF ENGINEERING &  
COMPUTER SCIENCE

Issue Fourteen // Summer 2018

## Nina Robson: Pushing the Boundaries of Teaching and Research

**With three master's degrees, a Ph.D. in mechanical and aerospace engineering, a history of cutting-edge research, and several years' experience as an engineering professor under her belt, Nina Robson could have gone just about anywhere. She chose to come to Cal State Fullerton in 2012, and became a valuable addition to an already stellar faculty.**

Now, Robson's groundbreaking work designing the next generation of robotic hands has helped her earn the National Science Foundation's CAREER award – making her the fifth faculty member to receive the prestigious \$500,000 grant.

“CSUF is the largest and most diverse school in the Cal State system, and plays a major

role in the economic, social, and educational development of the region. And California has a broad range of world-class mechanical and biomedical engineering and robotics companies,” says Robson, explaining why she chose CSUF. “These factors were very important to me, but what excited me the most was that the mechanical engineering

department at CSUF was growing and seeking new ideas to push the boundaries of teaching and research.”

Robson also notes how instrumental support from CSUF was in helping her secure the CAREER grant. Through the CSUF Office of Research and Sponsored Projects and the Health Promotion Research Institute, she was able to attend workshops on grant preparation, secure release time for proposal development, and gain insight from dedicated mentors.

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**Susan Barua**  
Dean, College  
of Engineering &  
Computer Science

## A Message from the Dean

From the moment I arrived on campus 30 years ago, I knew the College of Engineering & Computer Science was brimming with innovative potential. From its inspiring, forward-looking faculty and leadership to its scientifically talented and innately entrepreneurial students, the college was an incubator for people and ideas poised to change the world.

That spirit of constant discovery and unceasing commitment to broadening opportunities for future engineers and computer scientists is what drew me here. It's also what has kept me here in my various roles, including my long tenure as associate dean and my past two years as interim dean.

Now, as I eagerly take on the role of dean, I am grateful and excited to have the ability to both look back over all we've accomplished and look forward as our campus strives to build each student's and faculty member's innovative capacity. We want them to see their unique ideas through to fruition and forge the foundations for positive change right here. I am, and have always been, very proud to share news of the remarkable achievements of our students, faculty, and alumni. It is an honor to lead the college they all call home.

Together, we'll keep working to transform the college, so we continue to meet the needs of our students and faculty – and exceed expectations – as technology and our society evolve. Our quest has always been to give future engineers and computer scientists their best start. With a continued focus on creating opportunities for student success and intercollegiate, industry, and community partnerships; promoting high-level faculty research and experiential learning; and investing in innovation, we'll meet any challenge that comes our way. 🌟

“Dr. Robson’s teaching style allowed us to be very autonomous, but she always made sure we were headed in the right direction. She really went above and beyond, helping us problem-solve and troubleshoot, and even using her network of outside resources to assist us. She always pushed us and made sure we never got complacent.”

**MICHAEL MASHNI, ENGINEERING STUDENT**

## Building the Next Generation of Multi-Fingered Robotic Hands

Robson’s work in developing robust mechanical design principles for multi-fingered robotic hands could have a major impact on a wide range of industries, including manufacturing, health care, and biomedical engineering.

“In the future, robotic hands could play a major role in everything from picking produce to assisting the elderly and disabled,” says Robson. “But there are still many challenges that need to be solved first, like mimicking complex movements, accounting for the size and shape of objects being grasped and changes to and uncertainty in the external environment. The CAREER award grant will help develop the conceptual design tools to create more robust designs that significantly increase performance, adaptability, efficiency, and effectiveness.”

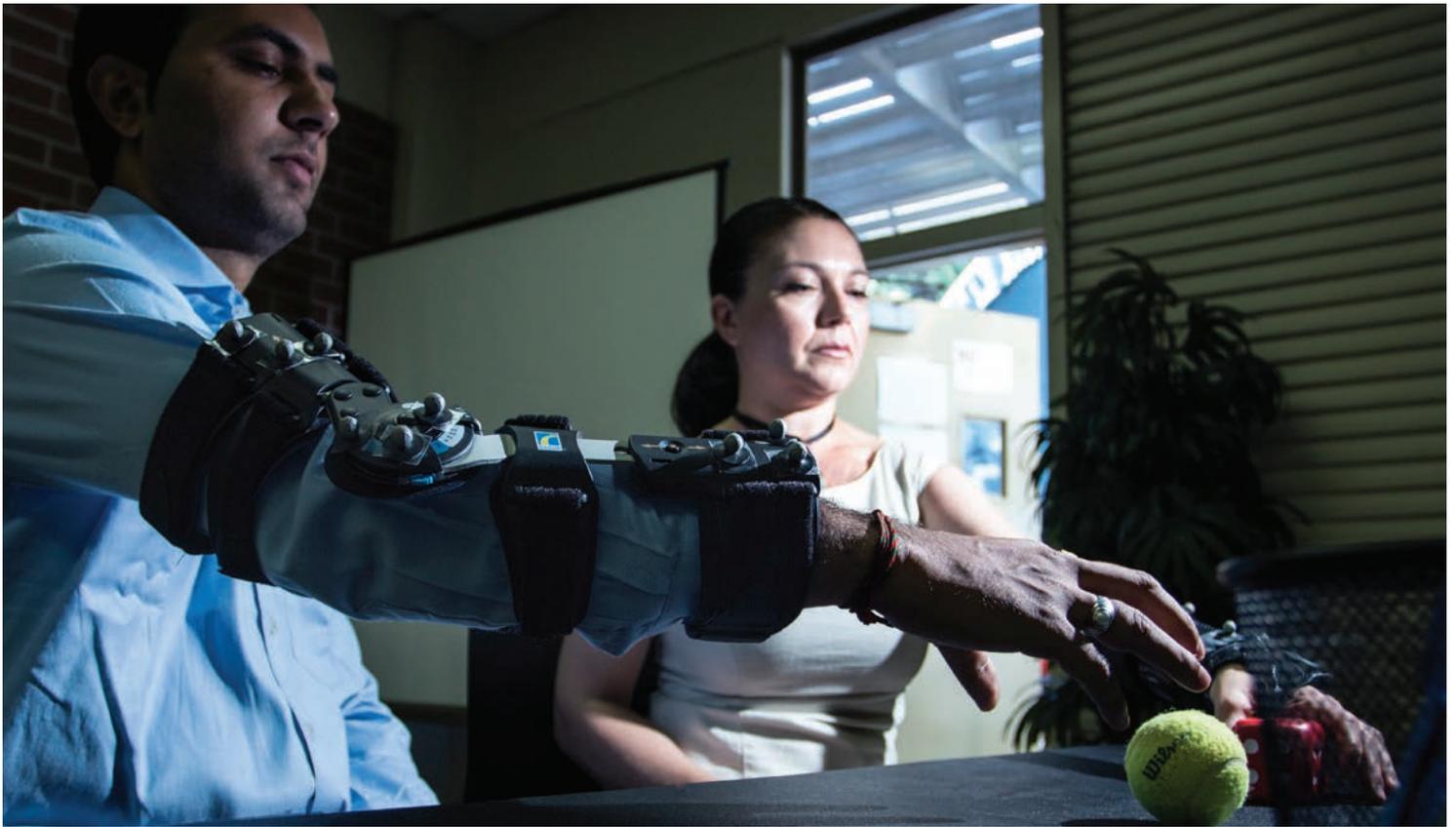
While the primary focus will be on the development of multi-fingered robotic hands, these conceptual design tools are expected to have broader implications for designing systems with the ability to accommodate uncertainties, such as modeling and construction of proteins, design of nanorobots, and virtual reality applications.

And, Robson notes, the grant will also enable her to integrate these concepts into her teaching, and prepare the next generation of CSUF engineers for a broad range of careers by exposing them to cutting-edge research.

## Hands-On, Collaborative Projects Prepare Students for Success

In addition to her own research, Robson is a faculty advisor on the Mars Rover Challenge, and mentors engineering students working on collaborative projects with a variety of corporate partners, including Disney, Bristol Industries, and Edwards Lifesciences.

“Dr. Robson’s teaching style allowed us to be very autonomous, but she always made sure we were headed in the right direction,” says Michael Mashni, an engineering student who headed a team that worked with Edwards Lifesciences to create an automatic device that would speed up their manufacturing processes. “She really went above and beyond, helping us problem-solve and troubleshoot, and even using her network of outside resources to assist us. She always pushed us and made sure we never got complacent.”



The efforts of CSUF engineering students on these projects have produced some impressive results. In the case of Edwards Lifesciences, the collaboration with the CSUF Automated Sewing of Artificial Heart Valve team resulted in the company filing a provisional patent in the beginning of 2018.

Other notable projects include the Articulated Robotic Hand team that assisted Bristol Industries in helping initiate the automation of some of its labor-intensive processes, and

three Disney teams that worked on research for integration of 3D manufactured parts, as well as enhancing some of the technology within the Big Thunder Mountain and Indiana Jones rides.

And when it comes to the Mars Rover Project, Robson notes that her time working with NASA's Ames Research Center on the development of novel failure recovery strategies for the Mars Rover robotic arm has made the team's success very exciting not just for the students, but for her as well.

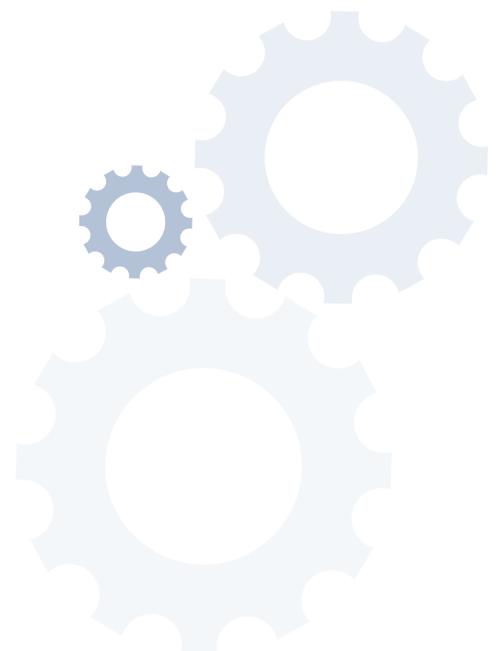
"Anytime industry partners and CSUF students collaborate on a project, it is a reciprocal learning process," says Robson. "Students get to participate in meaningful real-world industry problems, while our industry partners receive fresh, creative, innovative ideas that enhance their technologies."

"This experience is invaluable for preparing students for careers in engineering," adds Robson. ⚙️

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"When students deal with the development of complex systems, they learn to work in a multidisciplinary environment, and apply not only the necessary broad technical and science skills, but also soft skills, such as planning, communication, critical thinking, creativity, teamwork, and leadership."

**NINA ROBSON**





“To promote innovation, it must be woven throughout a course of study from the start. Students must brainstorm, create, and implement projects or strategies at the same time they’re learning the theory, technological mechanics, and mathematical or scientific formulas that underlie their creations.”



**SANG JUNE OH,  
INTERIM ASSOCIATE DEAN**



## Creating an Integrated Innovation Initiative

Smart buildings that conserve energy and streamline everyday operations. Nanotechnology filtration systems to expand access to sustainable, clean water around the globe. Internet of Things (IoT) technology connecting a huge amount of mineable data that can point to social trends, disease development, and economic direction. These are just a few examples of innovation that have already begun to revolutionize the way people work, live, communicate, make decisions, and support societies.

Innovation is coming up with a new idea, concept, or product with the potential to solve a problem or meet a pressing need – and then applying it to create value or inspire positive change at an institutional, field, societal, or even global level.

“That action component, that translation of idea to solution, is a natural fit for engineers and computer scientists,” says Susan Barua, dean for the College of Engineering & Computer Science. “When we send our graduates out into the real world, they’re equipped with a wide range of skills in their respective fields, fresh perspectives, and an innate drive to change their world for the better. They have a natural inclination to innovate, but we feel we can better build their capacity to see their ideas through to fruition through the foundations they forge here.”

What does that entail? While students already engage with distinguished faculty in hands-on labs, projects, and field experiences; build industry-applicable skills and professional networks through internships and mentoring relationships; and master a rigorous curriculum through active classroom participation – preparing tomorrow’s innovators requires an even greater investment.

“To promote innovation, it must be woven throughout a course of study from the start,” says Sang June Oh, interim associate dean. “Students must brainstorm, create, and implement projects or strategies at the same time they’re learning the theory, technological mechanics, and mathematical or scientific formulas that underlie their creations.” Oh says he is impressed with ECS students’ resiliency and drive. “Whatever path they take to get to the College of ECS, it’s our duty to provide them the best education we can and prepare them for successful careers,” he says.

The college will explore cross-disciplinary collaborations with other colleges on campus, increase transformative public/private partnerships – including the Corporate Partners program, and expand an agile curriculum that complements technical rigor with the soft skills needed to excel in the workforce.

Such a foundational change in the educational process will require an investment of time and funds from a variety of sources – namely the industries, business leaders, and institutions that stand to benefit most from adding newly minted innovators to their team who have the potential to take their mission to new heights and solve the greatest engineering challenges of our time. 🌟



## In Supporting Promising Scholars, an Inspiring Alumnus Lives On

“It will bring us immeasurable joy to hear of the future recipients of the scholarship – to hear their stories, their paths taken, and how the trajectory of their lives was shaped, in part, by Julian’s legacy.”

**KAREN TOGASHI**

When future computer science students are chosen to receive the Julian Togashi Living Legacy Scholarship, it will mean they embody the wisdom, wit, curiosity, and compassion of a 2012 Cal State Fullerton alumnus whose life was short but full of meaning.

The scholarship – funded by Larry Jia, CEO of Zymo Research, Julian’s employer, and created in partnership with his parents, Karen and Jiro Togashi – is an endowment designed to perpetuate Julian’s ideals and to give students in his field opportunities to achieve their educational and professional dreams.

Always a hardworking and insightful person, Julian’s enthusiasm, intelligence, and diligence were rewarded with a job offer from Zymo Research in Irvine while he was still a student at Cal State Fullerton. What had started as an internship became an opportunity for him to rise from intern to web developer/IT specialist to IT manager in just five years.

And, as a born mentor, he was pleased to be offered a part-time computer science teaching position in the College of Engineering & Computer Science. After his passing, Julian’s mother found letters to his students offering advice for success in the course, the field, and their futures, as well as a thank-you message from one student who praised his fairness, practicality, and deep understanding of the course topic.

“His special qualities in life need to continue forward, for him, for us, for everyone he touched and might yet have touched,” says Karen Togashi. “It will bring us immeasurable joy to hear of the future recipients of the scholarship – to hear their stories, their paths taken, and how the trajectory of their lives was shaped, in part, by Julian’s legacy.”

The scholarship is open to new or continuing full-time computer science majors who show scholarly merit, a collaborative spirit, and a commitment to mentorship, and who have elevated their own opportunities by elevating the opportunities of others. Undergraduate students Titus Sudarno and Ryan Teoh proudly serve as the inaugural recipients of the scholarship. 🌟

# Student Spotlight

## Students' Climate App Takes Second Place in GE Digital CSU Challenge

A team of Cal State Fullerton computer science, computer engineering, and business students developed Airis – a climate app that uses a cloud-based, “internet of things” software platform to address air quality and algae bloom issues in San Diego – which won second place and a \$5,000 cash prize at the third annual GE Digital CSU Challenge on April 29. The competition challenges students from eight CSU campuses to develop sustainability solutions using GE's Predix internet of things technologies. Computer science major **Austin Suarez** led the team, which also included **Nara Dashdondog**, **Maygan Hooper**, **Jonathan Moubayed**, **Jonathan Schinowsky**, and **Shripal Mithun Rawal**.



## Civil Engineering Students Receive Transportation Fellowships

Three Cal State Fullerton civil engineering students have been awarded fellowships from the Dwight David Eisenhower Transportation Fellowship Program for Hispanic-Serving Institutions. Undergraduate **Yuliana Carrillo** received a \$10,000 fellowship, and graduate students **Shelley Rodriguez** and **Rosalie Chavez** received \$7,500 and \$5,000, respectively. As fellows, the students also attended the January meeting of the Transportation Research Board in Washington, D.C.

- Carrillo's research focuses on rainfall-induced slope failures and how they relate to transportation issues.
- Rodriguez analyzes strength loss in clay soil during an earthquake.
- Chavez's research project focuses on slope instability to better understand factors that trigger landslides and how instability affects nearby transportation infrastructure.



- Civil engineering student Carlos Garcia has been awarded the Earthquake Engineering Research Institute's 2018 “Outstanding Undergraduate Student Paper Award.”
- Civil engineering students Brian Yamashiro and Quoc-Hung Phan co-authored a paper with their faculty supervisors, Dr. Beena Ajmera and Dr. Binod Tiwari, that received the “Best Paper Award” at the GeoShanghai 2018 International Conference.
- Civil engineering student teams won first place in the Geotechnical competition at the 2018 ASCE Pacific Southwest Conference and second place in the 2018 annual national GeoWall competition.
- The student chapter of the Association for Computing Machinery – Women (ACM-W), won the 2018 CSUF Tuffy Award for organizing the STEM Expo for Orange County Girl Scouts.
- Computer science student Phillip Ly won the Best Graduate Student Award at Student Creative Activities and Research Day 2018.
- Mechanical engineering student Vivek Menon won second place at the 32nd Annual CSU Research Competition, May 2018.

# ECS News



## Online Graduate Programs Rise in the Rankings

Cal State Fullerton's online graduate programs in engineering rose to a number 16 ranking – up from 26th in 2017 – in *U.S. News & World Report's* 2018 Best Online Graduate Engineering Programs list.

## Campus Celebrates ECS Week

Bringing industry professionals and students together, ECS hosted a variety of events in February supporting career exploration and networking among students, alumni, and professionals. ECS Week demonstrates how students' education translates into real-world application in the workforce. Events included an ECS Career Fair, Industry Talk, Spring Welcome & Club Fair, and our annual Professor for a Day event.



## ECS Student Project Showcase

On May 7, more than 80 student teams from across the college showcased their student projects at the ECS Student Project Showcase. The College Leadership Council, ECS Corporate Partners, industry leaders, and faculty all celebrated the students' accomplishments. We had a record number of applicants for the competition.

### The winners were:

- Best in Showcase – Titan Aero
- Best in Showcase Runner Up – Titan Rover
- Honorable Mention – SAE Baja
- Legacy Award – Formula SAE
- Best Software – Titan Park
- Most Innovative – Hybrid System for Removal of Carbamazepine from Water
- Capstone Award – Edwards Lifesciences IntraClude Balloon

Thank you to all the students, attendees and Corporate Partners who make this event possible!

## Cal State Fullerton Is Developing an Internet of Things Elective Track

Supported by a nearly \$300,000 grant from Cisco Systems Inc., Cal State Fullerton is at the forefront of developing an interdisciplinary undergraduate "internet of things" elective track that will provide students with technical skills for the emerging field of connecting smart devices to the internet. This new foundational curriculum will fall under CSUF's computer science and computer engineering programs. Anand Panangadan, assistant professor of computer science, is co-leading the effort with Kiran George, professor of computer engineering, and the new curriculum is being developed in partnership with representatives from Orange County technical industries.

# Faculty Focus

Congratulations to these faculty in the College of Engineering & Computer Science who have been named **"Faculty Advisors of Distinction"**:

**Doina Bein,**  
assistant professor  
of computer science



**Sagil James,**  
assistant professor of  
mechanical engineering

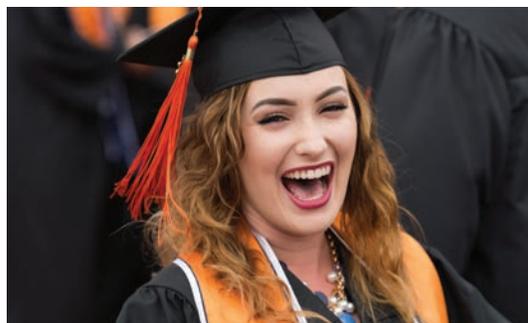
**Michael Turi,**  
assistant professor of  
computer engineering



**Haowei Wang,**  
associate professor of  
mechanical engineering

**Kevin Wortman,**  
associate professor  
of computer science





**Congrats to Our Grads**

The College of Engineering & Computer Science celebrates our newest class of graduates, and looks forward to watching as you take on the world!



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**Support the College of Engineering & Computer Science.**

Your gifts, your service, and your talent are fundamental to our goal of preparing graduates to solve 21st-century problems. *Here's how you can get involved with the college:*

**PLANNED GIVING AND DEFERRED GIFTS**  
Planned gifts can provide significant benefits to you and your family, now and in the future, while supporting generations of Titans to come. Consider including a bequest provision in your will or naming the College of Engineering & Computer Science at Cal State Fullerton as a beneficiary of your life insurance policy or retirement plan. Regardless of its size, your gift will make a difference in the lives of our students.

**DONATE NOW**  
at [giving.fullerton.edu](http://giving.fullerton.edu)

**DONATE LATER**  
at [csufplannedgift.org](http://csufplannedgift.org)

**VOLUNTEER OPPORTUNITIES**  
Share your career development experiences in the classroom, mentor an aspiring professional, or serve a department or program in an advisory capacity.

**INDUSTRY PARTNERSHIPS**  
Connect the college with your company – we're continually seeking partnerships that provide student project support, internship, and employment positions for our graduates, targeted research opportunities for faculty, and industry links that help facilitate curricular currency.

**CALL FOR GUEST PROFESSORS**  
Interested in sharing your professional experience with ECS students? Sign up to be a "Professor for a Day." Contact Michael Karg, senior director of development, at [mkarg@fullerton.edu](mailto:mkarg@fullerton.edu) today.

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- INTERIM ASSOCIATE DEAN**  
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- ASSISTANT DEAN**  
**Student Affairs**  
Carlos Santana
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- Computer Engineering**  
Kiran George, *Program Coordinator*
- Computer Science**  
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- Electrical Engineering**  
Jidong Huang, *Acting Chair*
- Mechanical Engineering**  
Chean Chin Ngo, *Acting Chair*
- Software Engineering**  
James Choi, *MSE Program Coordinator*

**For more information about getting involved with the college and gift planning, please contact:**  
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