UC San Diego
JACOBS SCHOOL OF ENGINEERING

NEWS
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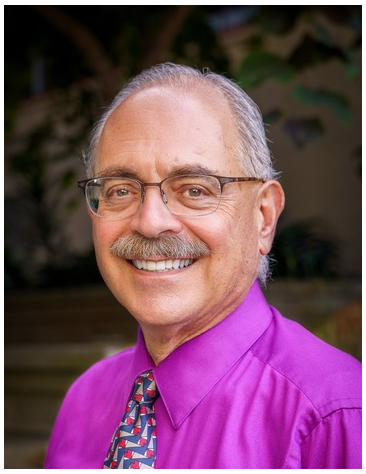
How fast could I re-do my PhD thesis?



Early on as a newly-minted PhD, something startling occurred to me. I realized that with the benefit of everything I'd learned in graduate school, I could have gone back and repeated my PhD thesis work quite quickly. My back of the envelope calculation: about five months. That's what it would have taken to build the testing platforms, do just the exact right experiments, analyze the data, and write it all up. If you subtract out all the time exploring blind alleys, you can express-run to the finish line.

Why do I bring this up now? Because I feel that it is our responsibility to make sure today's graduate students recognize just how much they are learning and growing when they are exploring the blind alleys of research. We must encourage graduate students to take the inevitable and necessary frustrations in stride – and even to take pleasure in the challenges of the search and research.

Engaging in this search can be daunting for a lone individual, which is one reason that thoughtful mentoring of graduate students is so important. It's one of the most powerful ways we can transmit our hard-won insights on the nature of engineering and computer science research. In fact, we launched an effort here at the Jacobs School of Engineering to recognize faculty in each of our six academic departments who are stand-out graduate student mentors.

Student-to-student mentorship is another critical activity. I'm proud to share that a chemical engineering graduate student here at the Jacobs School created a program called GradAMP that connects UC San Diego undergraduate students interested in graduate school with graduate students who are in the same area of research specialization. The team that created the program recently published a paper that explains how other schools can replicate it.

At the Jacobs School, we are dedicated to finding new and better ways to help our students ride the ups and downs of the search that is integral to research. We owe it to them – and we owe it to our larger society which benefits from their inspired innovations. Together, we must empower tomorrow's innovation workforce to embrace the inevitable research setbacks and frustrations.

As always, I can be reached at DeanPisano@ucsd.edu.

Sincerely,

Al

Albert ("Al") P. Pisano, Dean

UC San Diego Jacobs School of Engineering



$12.5 Million from DOE for matter under extreme conditions

The Center for Matter Under Extreme Conditions at UC San Diego received $12.5 million in funding from the U.S. Department of Energy (DOE). Farhat Beg, professor of mechanical and aerospace engineering at UC San Diego leads the center, which works in partnership with three other University of California campuses — Berkeley, Davis and Los Angeles as well as the University of Rochester and General Atomics. Launched with DOE funding in 2017, the program trains graduate students and postdocs who often go on to work at NNSA National Laboratories (Los Alamos National Laboratory, Lawrence Livermore National Laboratory and Sandia National Laboratories) or General Atomics.

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Grassroots graduate school mentorship

A UC San Diego chemical engineering graduate student created a mentoring program to help undergraduate students with the graduate school application process. The program is called GradAMP. It connects UC San Diego undergraduate students considering graduate school with graduate student mentors from the very same research area. In a new paper, the team outlines how the program works and encourages schools around the country to copy it. “We set up GradAMP so that the undergraduate mentee is paired with a graduate-student mentor in their specific research specialization. This way, the mentors can provide highly specific advice – what is exciting in their field, which groups or schools you might want to apply to, what funding opportunities are available, etc,” said Alex Chen, the program creator who just completed his chemical engineering PhD at UC San Diego.

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Pesticide microdosing

A UC San Diego nanoengineering research project aims to turn harmless plant viruses into eco-friendly carriers for small doses of pesticides. The big idea is to create less wasteful agricultural pesticide delivery systems. UC San Diego MRSEC postdoc Ivonne Gonzalez-Gamboa recently won first place in the national Nanotechnology Entrepreneurship Challenge for her efforts to move this project to market. Her entrepreneurship work builds on research from the lab of nanoengineering professor Nicole Steinmetz. Gonzalez-Gamboa was empowered via mentors from UC San Diego's Qualcomm Institute and Jacobs School of Engineering. She plans to use some of her winnings to fund time on high-powered microscopes at UC San Diego's Nano3 facility, in order to study the defanged virus' interactions with soil samples at the nanoscale.

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From race cars to exciting careers

A team of Jacobs School undergraduates overcame serious obstacles and clocked all-time best performances in this year's Formula Society of Automotive Engineers Competition at Michigan International Speedway. Their experiences provide a thrilling example of what a real-world engineering education can look like. The team is Triton Racing. Overall, they placed fourth out of 121 teams and third for fuel efficiency. Triton Racing is a student-led engineering team which designs and manufactures a formula-style car in one year. "I knew that being a part of this would help shape me into a well-rounded engineer," said Joseph Pallan, the president of Triton Racing and a student in mechanical engineering at UC San Diego. Graduating team members have landed jobs at Honda Performance Development, Hyundai Technical Center, Mercedes-AMG F1, Rivian Automotive, Tesla Motors and more.

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Robots are getting more agile. Here’s how.

Researchers led by UC San Diego electrical engineers have developed a new model that trains four-legged robots to see more clearly in 3D. The advance enabled a robot to autonomously cross challenging terrain with ease—including stairs, rocky ground and gap-filled paths—while clearing obstacles in its way. “Our approach allows the robot to build a short-term memory of its 3D surroundings,” said electrical engineering professor Xiaolong Wang. This new work builds on the team’s previous research, where researchers developed algorithms that combine computer vision with proprioception. The researchers presented their work at the 2023 Conference on Computer Vision and Pattern Recognition (CVPR).

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Earthquake simulator spotlight

Go under the shake table and inside a 10-story mass timber building with UC San Diego structural engineering professor Joel Conte. In this campus video, professor Conte shows us around UC San Diego's component of the world-class NSF Natural Hazards Engineering Research Infrastructure. Thanks to a major NSF-funded upgrade to the facility last year, the upgraded shake table allows researchers to test structures with unprecedented accuracy when compared to real earthquake ground motions.

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Structural engineering students host national bridge competition

Student teams from more than 40 universities descended on UC San Diego to compete in the nationwide finals of the Student Steel Bridge Competition. The goal of the competition is to

allow students to apply what they learned in the classroom to a practical hands-on project. “Our students made a tremendous effort–they both planned the competition and played significant roles on our team,” said structural engineering professor Machel Morrison. The UC San Diego student team won second place in several categories including bridge stiffness and efficiency. Watch video from the event.

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Standout Jacobs School undergraduates

The Jacobs School’s six engineering departments each selected an outstanding graduating senior this year. Reading through their experiences provides a tour of the opportunities available to Jacobs School undergraduates as researchers, tutors, student leaders, engineering-team members and so much more. “UC San Diego offered me an opportunity to not only take courses in my major of study, computer science, but also to undertake academic tutoring and undergraduate research to expand on my skill set and give back to students and the community,” said graduating computer science student Yash Shah. “I was able to pick up a minor in Humanities and learn to question why we do things the way we do and what impact they have on us as humans.” A few more standout students graduating from the Jacobs School are featured here.

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