UC San Diego
JACOBS SCHOOL OF ENGINEERING

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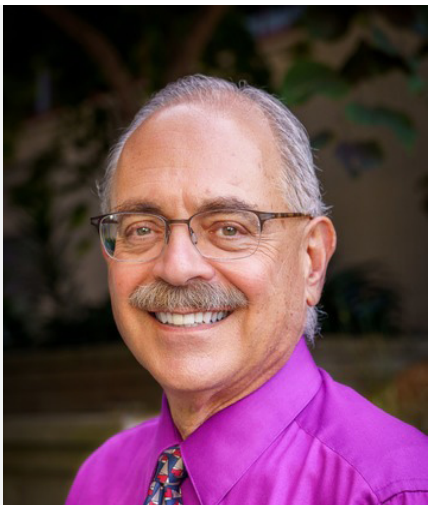
We should practice what we teach



As an engineering dean, I feel the weight of the future of our U.S. innovation economy on my shoulders. (I sense an even greater weight on the collective shoulders of the Jacobs School of Engineering here at UC San Diego.) Talented graduates in engineering and computer science are critical for building and sustaining innovation-driven industrial ecosystems in this country. These ecosystems, in turn, are critical for U.S. innovators and companies to emerge and remain competitive in the global marketplace. The tools I think we need, in order to make this happen, are Innovation Centers for the Practice of Platform Technologies.

Many people reading an email from an engineering dean know, as I do, that critical talent and technology come from all across campus. While I'm focused on engineering and computer science today, this argument can extend to many other parts of a university.

I don't think we spend enough time discussing how engineering schools can work within and across universities, and with government and industry, to help strengthen the future of the U.S. innovation economy. I believe that practice is a useful entry point to these conversations.

Graduate students need more opportunities to practice using what they are learning. They need this practice in relevant contexts, and this context goes beyond the boundaries of their thesis work. Undergraduate students at every school across the country need these inspiring and exciting opportunities too. It helps reinforce their grasp of the subject matter and improves problem solving. I'm particularly proud of our efforts in this area for undergraduates, including Project in a Box, the Experience Engineering Initiative, our Team Internship Program, and Global Ties, to name just a few of our many hands-on programs. But I would offer the time is now for new platforms that scale nationwide and reach well beyond project-based undergraduate learning. These platforms should engage in technologies that are strategically important and can be pivoted for use in emerging applications. That's how we'll inspire more young people. That's how we'll move the needle on equity, diversity, and inclusion and on global competitiveness.

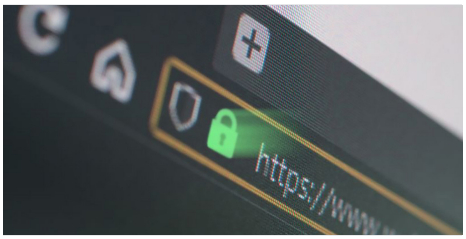
As I would have it, we need to create rich, dynamic ecosystems in which students of all levels, as well as seasoned researchers in industry, government and academia, can interact with a networked, virtualized research infrastructure that is specifically designed to encourage learning and engagement through practice. If we build these Innovation Centers for the Practice of Platform Technologies right, our colleagues in U.S. industries and government sectors will have compelling ways to interact with diverse pools of new talent.

I'm currently working on a more detailed blueprint for these practice-focused innovation centers. And I am hoping this vision resonates with people inside and outside the Jacobs School of Engineering. I'll be communicating more about this soon. I'm hoping to get buy-in from a broad sector of colleagues because, in the end, this will never work unless we are all pulling in the same direction.

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

-Albert P. Pisano, Dean

UC San Diego Jacobs School of Engineering



Making web browsers safer

Computer scientists at UC San Diego are working with colleagues at UT Austin and Stanford to make web browsers safer. Last year, the team developed a framework, called the RLBox framework, that was integrated into Firefox to complement Firefox's other security-hardening efforts. RLBox increases browser security by separating third-party libraries that are vulnerable to attacks from the rest of the browser to contain potential damage. With a new NSF grant, the team is expanding their focus to the other huge attack vector: the browser's JavaScript just-in-time (JIT) compiler.

Learn more: bit.ly/SaferWebBrowsers

Optimal pressure for battery performance

A team of materials scientists and chemists has determined the proper stack pressure that lithium metal batteries need to be subjected to during battery operation in order to produce optimal performance. The team, which includes researchers from UC San Diego, Michigan State University, Idaho National Laboratory and the General Motors Research and Development Center, presented their findings in Nature Energy. This could help lithium metal batteries become a viable option for powering electric vehicles or electronics.

Learn more: bit.ly/LMBoptimumpressure

$11.7 million NIH grant will advance genomic medicine

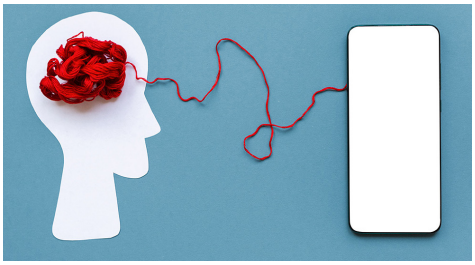
Researchers at UC San Diego landed an $11.7 million NIH grant to identify genomic and socioeconomic factors contributing to health and disease in admixed individuals, whose DNA reflects multiple ancestries. Housed at the UC San Diego School of Medicine, the Genetic & Social Determinants of Health: Center for Admixture Science and Technology (CAST) is co-directed by Melissa Gymrek, a professor of computer science and medicine. "We want to bring the genomic revolution to everyone," said Gymrek.

Learn more: bit.ly/GeneticCAST

Making space inclusive for all

In a weightless, microgravity environment like space, what do ability and disability look like? How can someone with partial sight or impaired mobility navigate in a confined area like the space station? UC San Diego researchers were part of the Mission: AstroAccess team that aimed to answer these questions by launching a group of 12 disabled scientists, veterans, students, athletes and artists into a zero-gravity environment as a first step toward understanding what is needed to make space inclusive for all.

Learn more: bit.ly/UCSDAstroAccess



Smartphone-based Alzheimer's screening

Electrical engineers at UC San Diego are collaborating with UC San Diego's Center for Mental Health Technology (MHTech) to develop a smartphone app that can screen for early signs of cognitive decline indicative of Alzheimer's Disease. The engineers, in collaboration with researchers from the Design Lab at UC San Diego, aim to leverage camera systems found in smartphones to capture pupillary responses to cognitive tests as an indicator of the integrity of a specific part of the brain that has been shown to be one of the first sites affected by Alzheimer-related processes. The project just received a boost from an exploratory grant from NIH.

Learn more: bit.ly/AlzheimersScreening