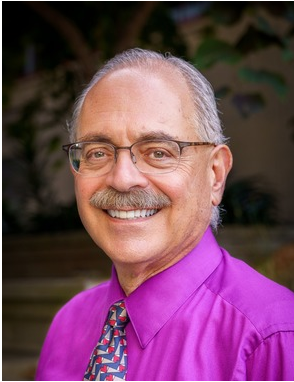


Creating Opportunities



Our most recent Dean's Council of Advisors meeting energized me greatly. Why? Because I could feel new opportunities being created at the intersection of engineering and the actual practice of healthcare.

My excitement stems from moments of direct dialogue between our Jacobs School of Engineering faculty and physicians from the [Joan & Irwin Jacobs Center for Health Innovation](#) (JCHI) at UC San Diego Health. One of this Center's early successes is the roll out of an artificial intelligence (AI) model in the emergency departments at UC San Diego Health in order to quickly [identify patients at risk for sepsis infection](#). The system provides physicians with actionable information ahead of obvious clinical manifestations.

This term actionable information returned again and again throughout the Dean's Council meeting. We identified many opportunities to collaborate in order to arrive at actionable information that could be leveraged to save lives, while also improving the practice of healthcare.

Identifying actionable information and then integrating it into electronic health records is the important work of physicians in centers like JCHI. And to get to this actionable information, the most forward-looking doctors and centers must partner with engineers and computer scientists.

World-class engineering and computer science faculty are essential for creating the private and secure hardware, software, communication and sensor systems – and the requisite AI/ML, data and compute innovations – that are needed to generate streams of raw data and then turn them into actionable information.

[Faculty at the Jacobs School are, in fact, partnering with JCHI](#) already in these areas. A bed sensor project incorporating AI for chronic disease monitoring is one example. A hypertension and diabetes monitoring project with continuous glucose sensing and AI applications is another. But we can create so many more opportunities.

At one point during the Dean's Council meeting, the conversation turned specifically to what kinds of wearable health monitoring systems could be game changers for improving how patients interact with their healthcare provider.

The consensus was that non-traditional research collaborations are required to get engineering faculty at the same table as the teams with influence on what flows into electronic health records.

At that moment, I felt something. The engineers, the physicians and Dean's Council members – many with hard-won wisdom from industrial R&D experiences – all clicked onto the same wavelength.

There are huge opportunities to be created here.

In the coming months, we will stand up an institute for healthcare engineering here at the Jacobs School of Engineering. This institute will help to empower our Jacobs School faculty to partner with JCHI and others on projects aimed at delivering actionable information in healthcare contexts.

If you are inspired to learn more or get involved, please reach out. Behind-the-scenes work has begun, and I look forward to sharing much more next year.

I am confident about the prospects of success of this institute because I can see it building on research and educational strengths across every academic department in the Jacobs School, as well as many centers, including our [Center for Wearable Sensors](#); [Center for Nano-ImmunoEngineering](#); [Center for Machine-Intelligence, Computing and Security](#); and [Center for Wireless Communications](#).

Looking across campus, it's clear that this institute will be complementary to, and relevant for, the many efforts that bring medicine, health, engineering and computer science together, including the [UC San Diego Center for Healthcare Cybersecurity](#), the [Center for Microbiome Innovation](#), and the [Institute of Engineering in Medicine](#), with some of its focus on [understanding and enhancing human performance](#).

From my vantage point, grand challenges are almost never solved via one institute or another. It's part of the UC San Diego magic that impactful efforts, and the people and ideas behind them, self assemble as a community of innovators.

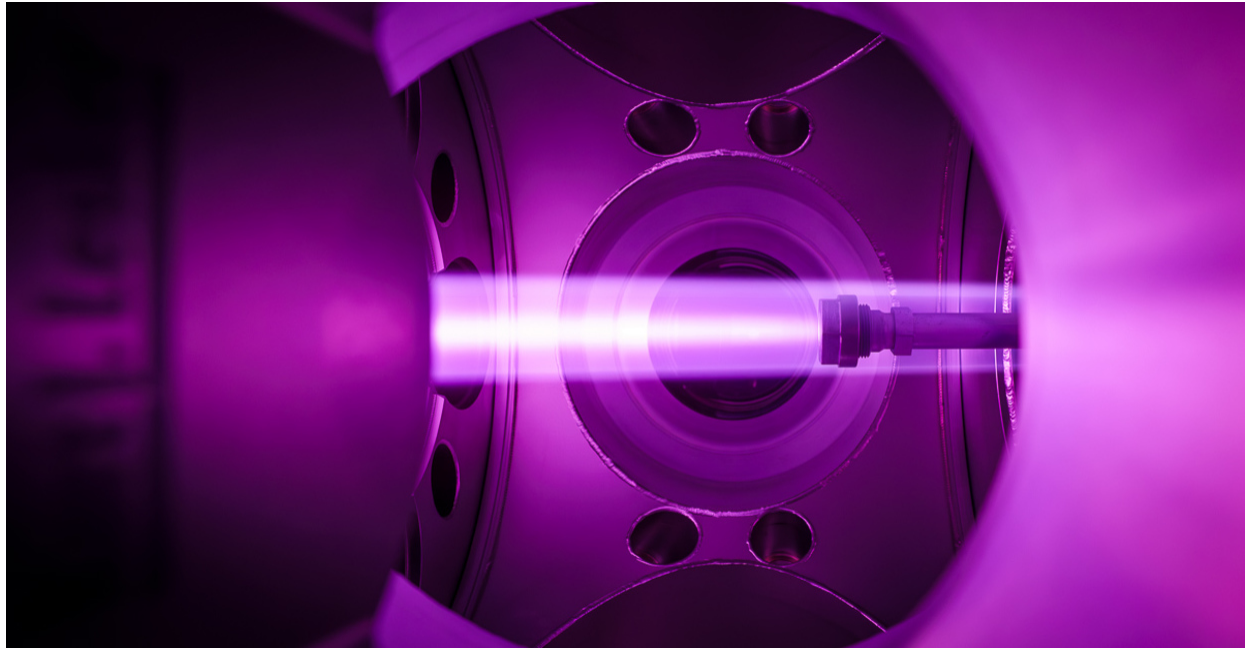
If you are interested in getting involved in our efforts to bring academic engineering and computer science more directly into efforts to improve the practice of healthcare, please get in touch. Working together like this is how we make **bold** possible.

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

Sincerely,

AI

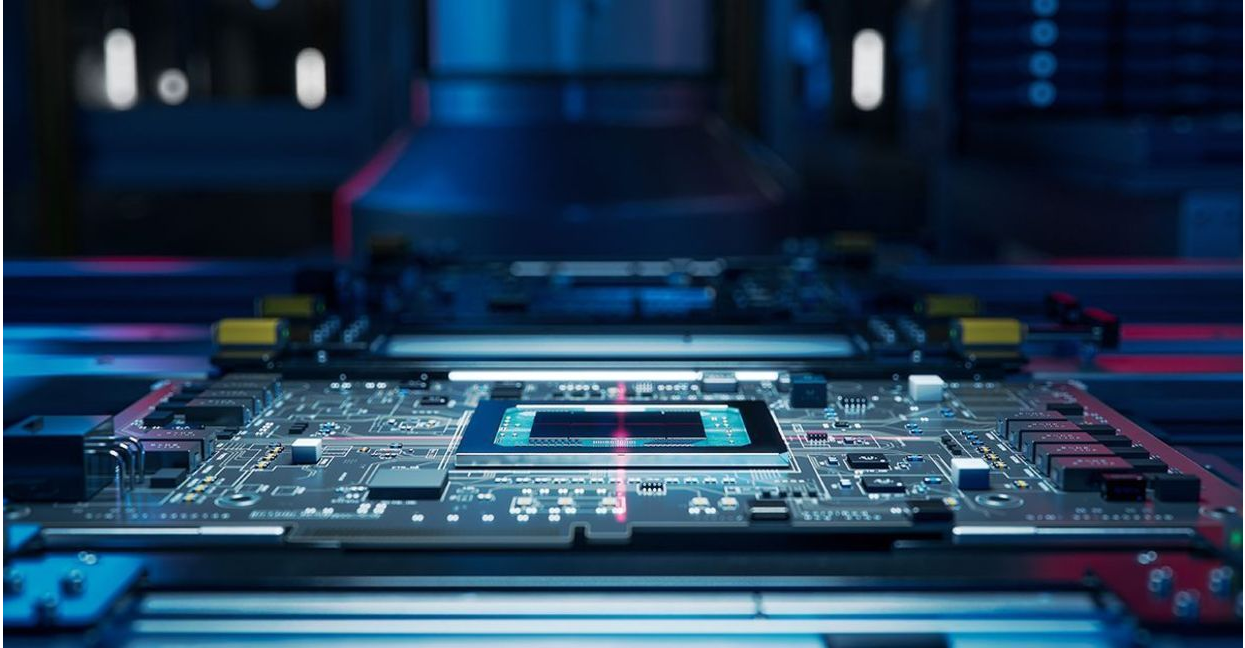
Albert ("AI") P. Pisano



Fusion Facility Wins Funds to Expand Positive Impact

Fusion researchers at the Jacobs School were recently awarded funding to open an important fusion research facility, known as PISCES, on campus to external teams. The facility mimics the conditions that occur at the wall of a fusion reactor when it is running. The DOE ARPA-E program funding this \$1.35M project is called CHADWICK, which stands for Creating Hardened And Durable fusion first Wall Incorporating Centralized Knowledge. In October, the Jacobs School launched the [UC San Diego Fusion Engineering Institute](#).

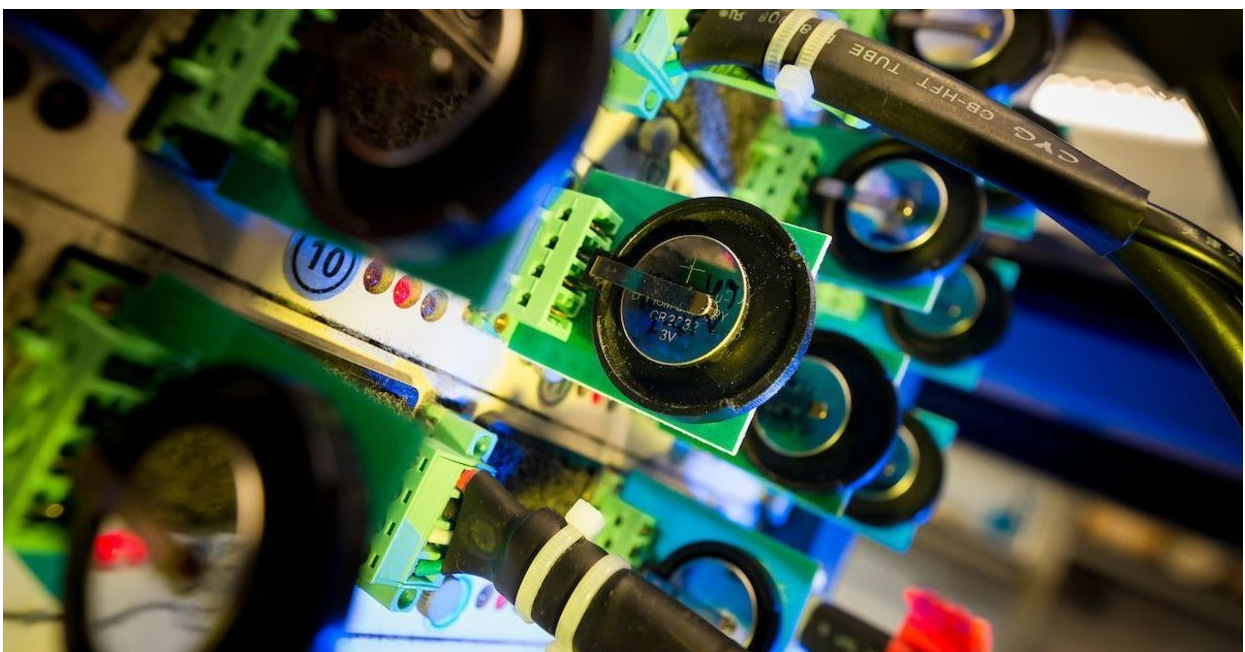
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A World-renowned Open Source Chip Design Tool

A \$17.2M DARPA project led by the Jacobs School yielded a useful and popular open-source electronic design automation (EDA) tool, which has attracted an enthusiastic and diverse user base of students, educators, academic researchers, and chip designers from well-established companies as well as startups. The team has developed a sustainable business model to allow [OpenROAD](#) to continue now that the initial federal funding has ended. The overall project has been led by Andrew Kahng, a professor in both the computer science and the electrical engineering departments at the Jacobs School.

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A Series of Battery Wins

Our [Sustainable Power and Energy Center](#) (SPEC) is having a banner year. Center researchers are part of two cutting-edge Energy Innovation Hub teams that have collectively been awarded \$125M in funding over the next five years by DOE. [South 8](#), a startup spun off from SPEC research, was chosen as [one of TIME's best innovations of 2024](#). [UNIGRID](#), another startup with SPEC roots, [recently received investments from LG Technologies Ventures](#). Earlier in 2024, a [\\$3M gift](#) boosted battery research, education and collaboration across SPEC.

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Two Jacobs School Faculty Receive Revelle Medals

Two emerita professors were honored for their sustained, distinguished and extraordinary service to campus. Fan Chung Graham is on faculty in the Departments of Mathematics and Computer Science and Engineering and held the Paul Erdős Chair in Combinatorics at UC San Diego. Jan Talbot is a founding faculty of our nano engineering department, recently renamed the Aiso Yufeng Li Family Department of Chemical and Nano Engineering. She was honored this year through the creation of the [Jan Talbot Endowed Chair in the Jacobs School of Engineering](#).

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Long-term, Wireless Muscle Monitoring with Ultrasound

A team of researchers developed a wearable ultrasound device that can provide long-term, wireless monitoring of muscle activity. Monitoring diaphragm motion and thickness to assess respiratory health is one potential healthcare application. Creating new human-machine interfaces is another. For example, the new device uses artificial intelligence to correlate ultrasound signals from the forearm with specific hand gestures. This ability to recognize gestures enables the device to be used as a human-machine interface to control a robotic arm and play a virtual game. The work is led by Sheng Xu, a professor and Jacobs Faculty Scholar in our Aiso Yufeng Li Family Department of Chemical and Nano Engineering as well as a member of our [Center for Wearable Sensors](#).

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A Bioengineer Leads in Neuromorphic Computing

Bioengineering professor Gert Cauwenberghs is one of four researchers leading a new hub that will provide access, across the US, to open and heterogeneous neuromorphic computing hardware systems through The [Neuromorphic Commons Hub](#) based at UT San Antonio. The hub is funded by a \$4M grant from NSF. The goal is to foster interdisciplinary collaborative research on the neuronal foundations of biological intelligence, covering the full spectrum from perception and decision making to continual learning in the physical world.

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Accelerating Data-intensive Research on Campus

Providing Ph.D. students with opportunities to engage in real-world, data-centric projects alongside faculty and industry is a priority of UC San Diego's [Data Planet Initiative](#). The initiative aims to enable easily reproducible, shareable, and searchable data-intensive research at UC San Diego. Jingbo Shang, a professor in both computer science and the Halicioglu Data Science Institute, is the new leader of the initiative. He aims to increase the number of fellows and introduce new research projects tied to this collective campus resource.

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