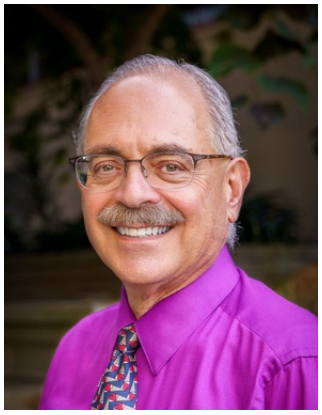
UC San Diego
JACOBS SCHOOL OF ENGINEERING

NEWS
December 2024

Awards and Awe, 15 Times Over!



Our Franklin Antonio Hall here at the UC San Diego Jacobs School of Engineering opened just two years ago, and in that time it has won 15 architecture and design awards – and counting. In this final Dean's column of 2024, I'd like to step back and discuss the bigger picture of Franklin Antonio Hall – and what these awards mean to me.

But first, as we enter the holiday season, allow me to pause to count my blessings. I am incredibly grateful to everyone who is part of our Jacobs School community. To our students, staff, faculty, alumni, industry partners, friends – and to the larger community that enables us to advance engineering and computer science for the public good: THANK YOU! I am deeply grateful.

And in fact, it is the generosity of many people all across our Jacobs School community that has made Franklin Antonio Hall such a success. This generosity makes the avalanche of awards for the building particularly meaningful to me. Thank you to everyone who has stepped up! We couldn't have done it without you. And yes, there are still opportunities to get involved in philanthropy and drive impact in the building. Please get in touch if you'd like to learn more.

From the beginning, my goal for Franklin Antonio Hall was to create an academic engineering building that would:

- Maximize the circulation of people and ideas
- Stand the test of time
- Welcome industry
- Benefit people outside of the Jacobs School of Engineering

These four mantras served as human-centric performance objectives for the design and programming of Franklin Antonio Hall. They shaped all aspects of building design and programming. I am absolutely thrilled that the architecture and building-design

community is recognizing the outcomes of this process with so many awards.

As I look back on all that went into designing, programming and fundraising for the building, I see the DNA of our Jacobs School. In fact, our efforts in Franklin Antonio Hall to advance engineering and computer science in order to deliver positive outcomes for society are a microcosm of what we do all across our Jacobs School.

This year we ranked #1 in the nation for citations per publication among all public engineering schools, according to the US News Rankings of Best Engineering Schools. Many of our faculty also rank among the world's most influential researchers. I am incredibly proud that we are being recognized by our academic peers for our research accomplishments. Citation rankings represent a direct vote of excellence and relevance from our engineering and computer science faculty peers at other universities.

When I step into Franklin Antonio Hall, I actually feel this excellence and relevance. It merges into a sense of awe. I feel this awe when I look up into the soaring atria and see our research collaboratories that draw people from different disciplines together to work on the most difficult challenges that no lab, discipline or industry can solve alone.

I also feel this awe when I allow these research collaboratories to shift into my peripheral vision so that I can gaze through one of the atria and out into the bright blue sky. Looking into the great beyond, I think of what more we might do by building on our strengths. I think of the powerful moves we are positioned to make thanks to the fertile, collaborative, cross-disciplinary research and entrepreneurship communities here in Franklin Antonio Hall and across the Jacobs School. I think of the institutes we are building. Fusion engineering, healthcare engineering and carbon-negative biomanufacturing are three exemplars.

I think of all the potential we have to connect in the coming year on shared efforts to advance engineering and computer science education, research and innovation for the public good. I look up, and with this sense of awe, I look forward to all of it – and I sincerely thank everyone inside and outside the Jacobs School who is part of our community. Together, we make **bold** possible.

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

Sincerely,
Al
Albert ("Al") P. Pisano

Dean, UC San Diego Jacobs School of Engineering
Special Adviser to the Chancellor for Campus Strategic Initiatives

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Vision-restoring Whole Eye Transplant

UC San Diego electrical engineers are a key part of a nationwide effort to restore vision in people through whole-eye transplants. The $56 million Advanced Research Projects Agency for Health (ARPA-H) project is led by Stanford and will rely on donor eyes, advanced surgical protocols and electrodes to regenerate the optic nerve. UC San Diego electrical engineers are developing a wireless, multi-modal electrode system to wire the optic nerve to the brain with high-end precision to restore vision after an eye transplant. Electrical engineering professor Shadi Dayeh leads the cross-disciplinary UC San Diego effort, which collaborates closely with a team at Scripps Research.

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Mechanical Engineering and Materials Science and Engineering in Top 10

Here at UC San Diego, we rank #8 in the nation for mechanical engineering and #10 in the nation for materials science and engineering, according to the 2024 ShanghaiRanking's Global Ranking of Academic Subjects (GRAS). This ranking system uses a range of objective academic indicators and third-party data to measure the performance of world universities in many subjects including mechanical engineering and materials science.

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16 Jacobs School Researchers on Highly Cited List

Congratulations to the 16 faculty members and affiliates of the Jacobs School who are among this year's list of most highly cited researchers by Clarivate. The Jacobs School researchers hail from a wide range of disciplines including bioengineering, bioinformatics, computer science, electrical engineering, materials engineering, and nano engineering. Several of these researchers are also successful entrepreneurs who are translating their advances into real-world solutions.

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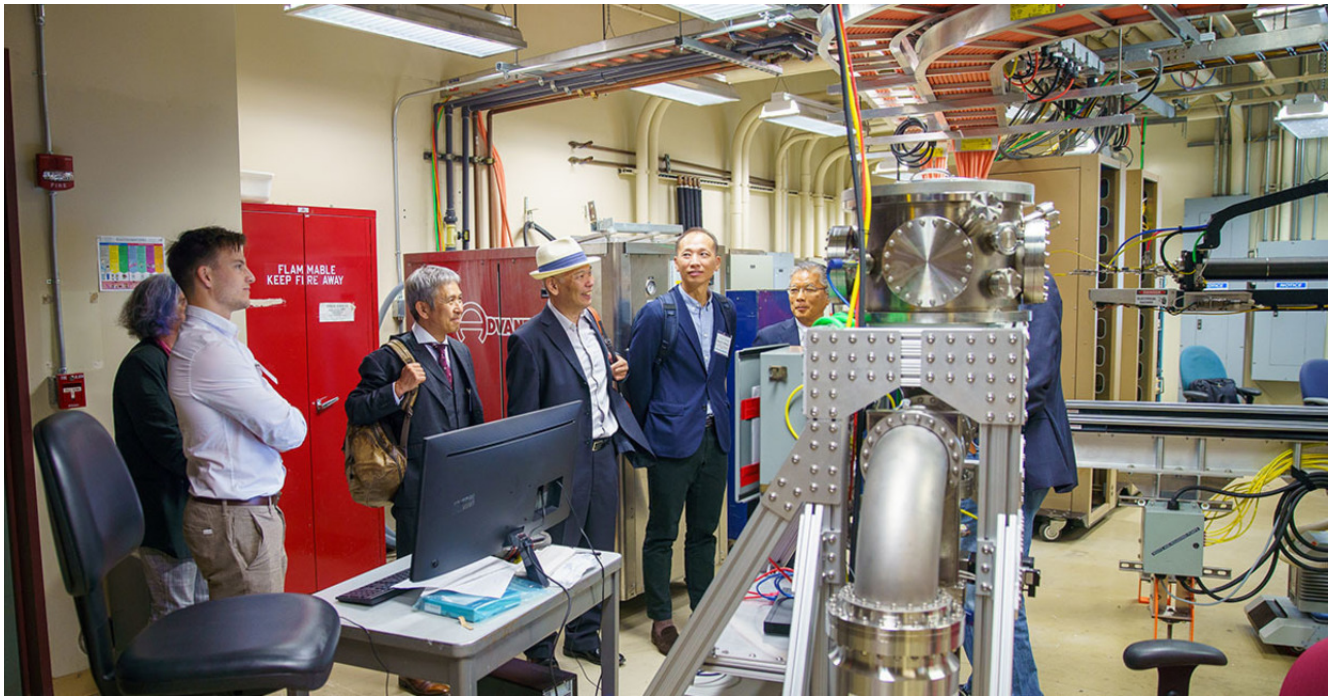

Fusion and Microgrid Researchers Build US-Japan Collaborations

A recent meeting between Japanese and U.S. engineers from the Jacobs School yielded promising results. The Japan-Jacobs School teams agreed to collaborate to advance digital technologies and algorithms for microgrids and to solve the issue of heat generation and waste in semiconductor devices. The meeting's theme was "The Future of Clean Energy Technology," with presentations on microgrid and fusion research from the Jacobs School, Kyoto University and industry.

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Three Engineers Receive Prestigious DURIP Funding

Three Jacobs School faculty are among the 10 UC San Diego recipients of Defense University Research Instrumentation Program (DURIP) awards from the U.S. Department of Defense (DOD). No other university received this many DURIP awards this year. Electrical engineer Florian Meyer is creating a sonar sensor that allows autonomous underwater vehicles to better navigate and map the seafloor. Mechanical engineer Drew Lucas is improving a system that collects information throughout the water column, with the goal of better validating satellite measurements and enhancing researchers' ability to forecast ocean conditions. Structural engineer Ken Loh is developing a portable motion capture system that doesn't need physical markers placed on the body in order to capture and analyze human performance.

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Accelerating Climate Modeling with AI

Computer scientists brought together the algorithms behind generative AI tools like DALL-E and physics-based data to develop better ways to model the Earth's climate. The new model, for example, can project 100 years of climate patterns in 25 hours – a simulation that would take weeks for other models. The model starts off with knowledge of climate patterns and then applies a series of transformations based on learned data to predict future patterns.The team at UC San Diego, led by computer scientist Rose Yu, hopes to further advance the models to generate climate change predictions.

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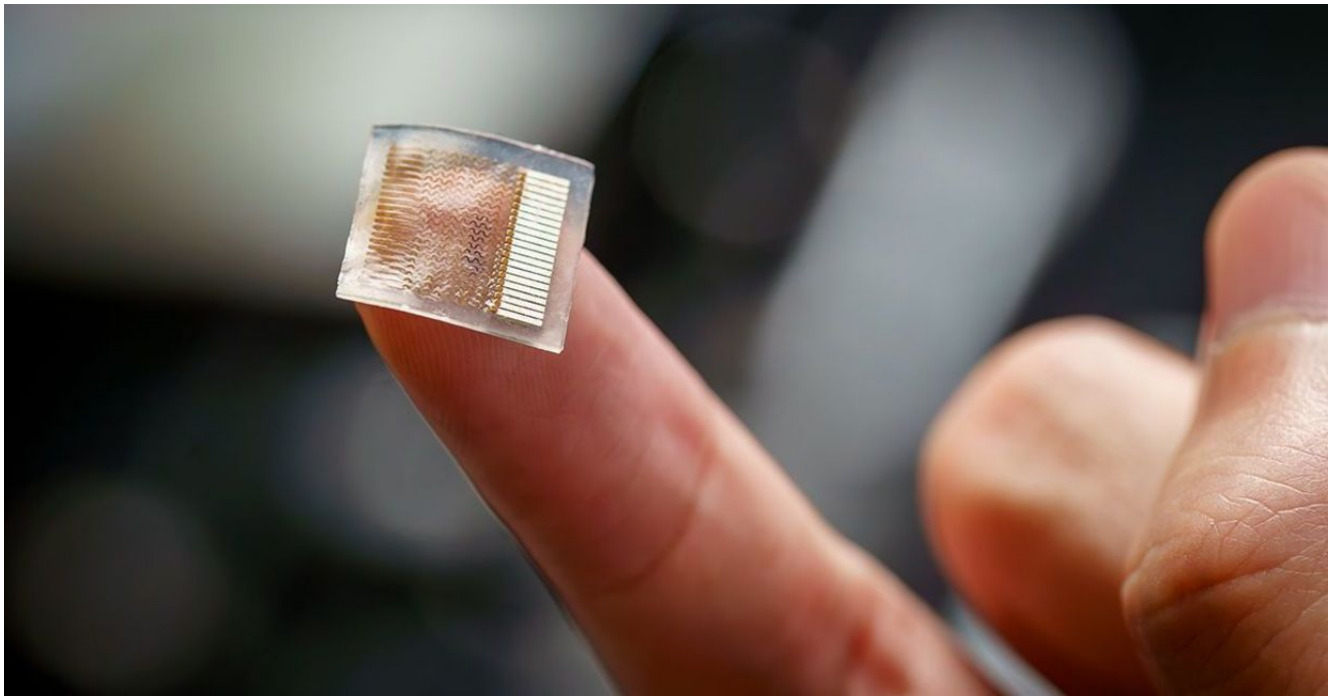

Validating Wearable Ultrasound for Blood Pressure Monitoring

A wearable ultrasound patch for continuous blood pressure monitoring is the first device of its kind to undergo comprehensive clinical validation on over 100 patients, marking a major milestone in wearable technology research. The soft and stretchable patch, developed by UC San Diego engineers led by nano engineering professor Sheng Xu, provides precise, real-time readings of blood pressure deep within the body. This project is built on close collaborations between engineers and clinicians. The team is preparing for large-scale clinical trials and plans to integrate machine learning to further improve the device’s capabilities. Efforts are also underway to validate a wireless, battery-powered version for long-term use and seamless integration with existing hospital systems.

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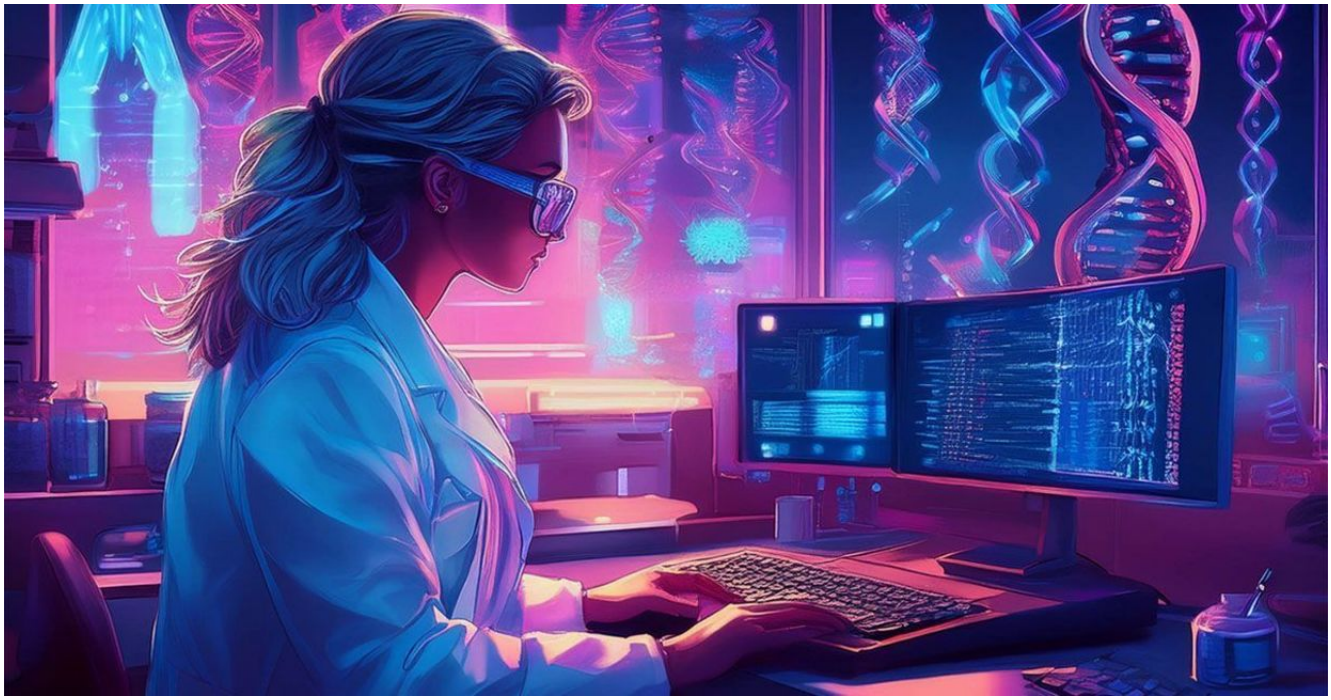

How AI Could Automate Genomics Research

Using large language models (LLMs), such as ChatGPT-4, to analyze gene sets could save scientists many hours of intensive labor. It could also bring science one step closer to automating one of the most widely used methods for understanding how genes work together to influence biology. The study, led by Professor Trey Ideker, highlights the need for continued investment in the development of LLMs and their applications in genomics and precision medicine.

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