PLANAR

University of Hawai'i at Mānoa



PRODUCT
DirectLight Pro Series
Large Format LCDs

LOCATION
Honolulu, Hawai'i

INDUSTRY
Higher Education

APPLICATION
Data Visualization
Virtual Reality
On-Camera
Video Production

Planar LED Technology Supports Diverse Applications at University of Hawai'i at Mānoa

Established in 1907 and located in Mānoa Valley just outside Honolulu, the University of Hawai'i at Mānoa is the largest and oldest of the 10 University of Hawai'i campuses. Serving a total student population of 20,028, the university maintains an active research program and offers hundreds of undergraduate, graduate and professional degree programs.

Across campus, Planar LED display technology is creating new opportunities for immersive learning, communication and hands-on training.

Laboratory for Advanced Visualization & Applications

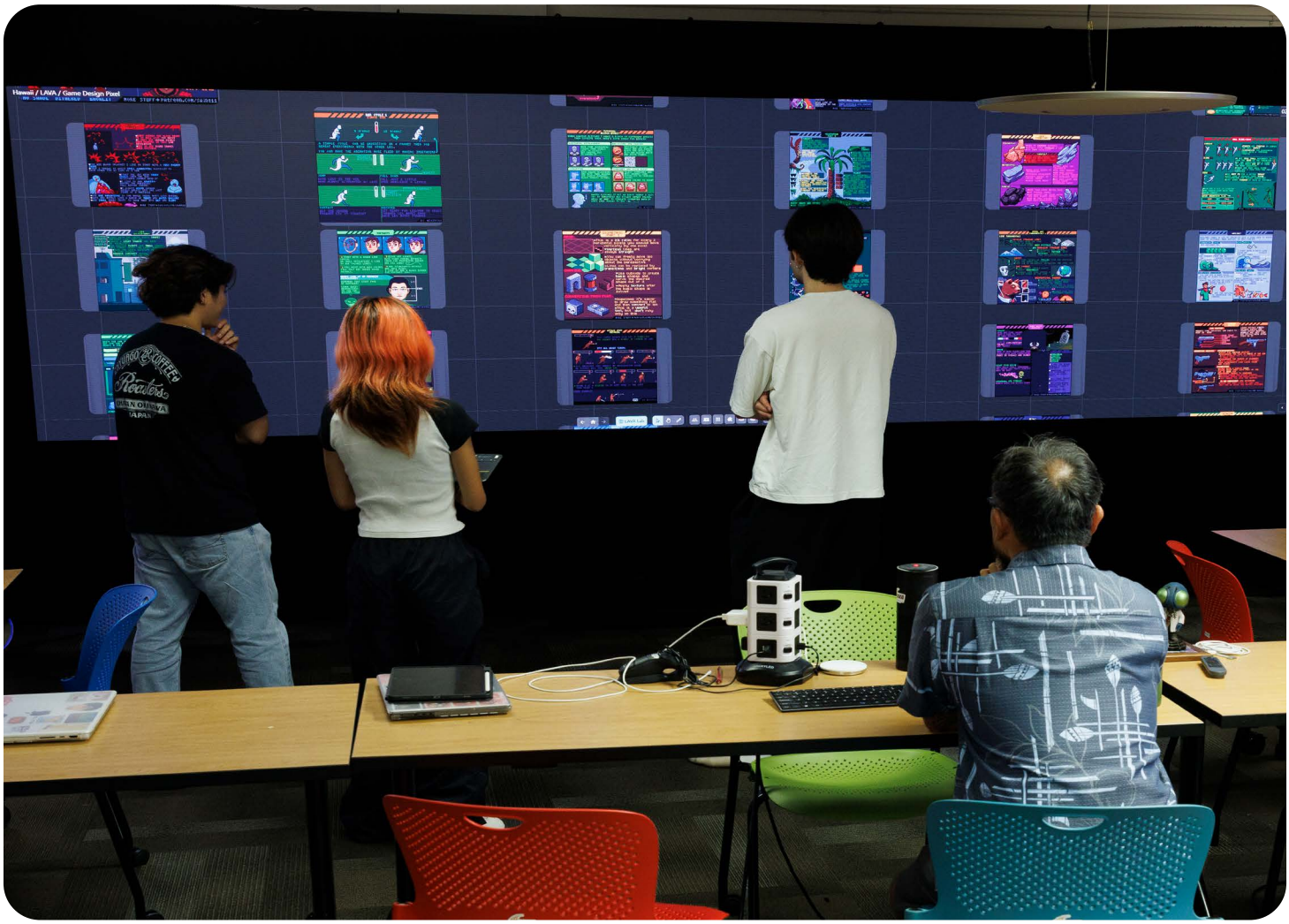
Within the Department of Information and Computer Sciences, the Laboratory for Advanced Visualization and Applications (LAVA) is a research hub for data visualization, virtual reality and artificial intelligence. The facility provides researchers, students and community partners with tools to see and interact with complex data in novel ways, advancing scientific discovery, engineering innovation and interdisciplinary collaboration.

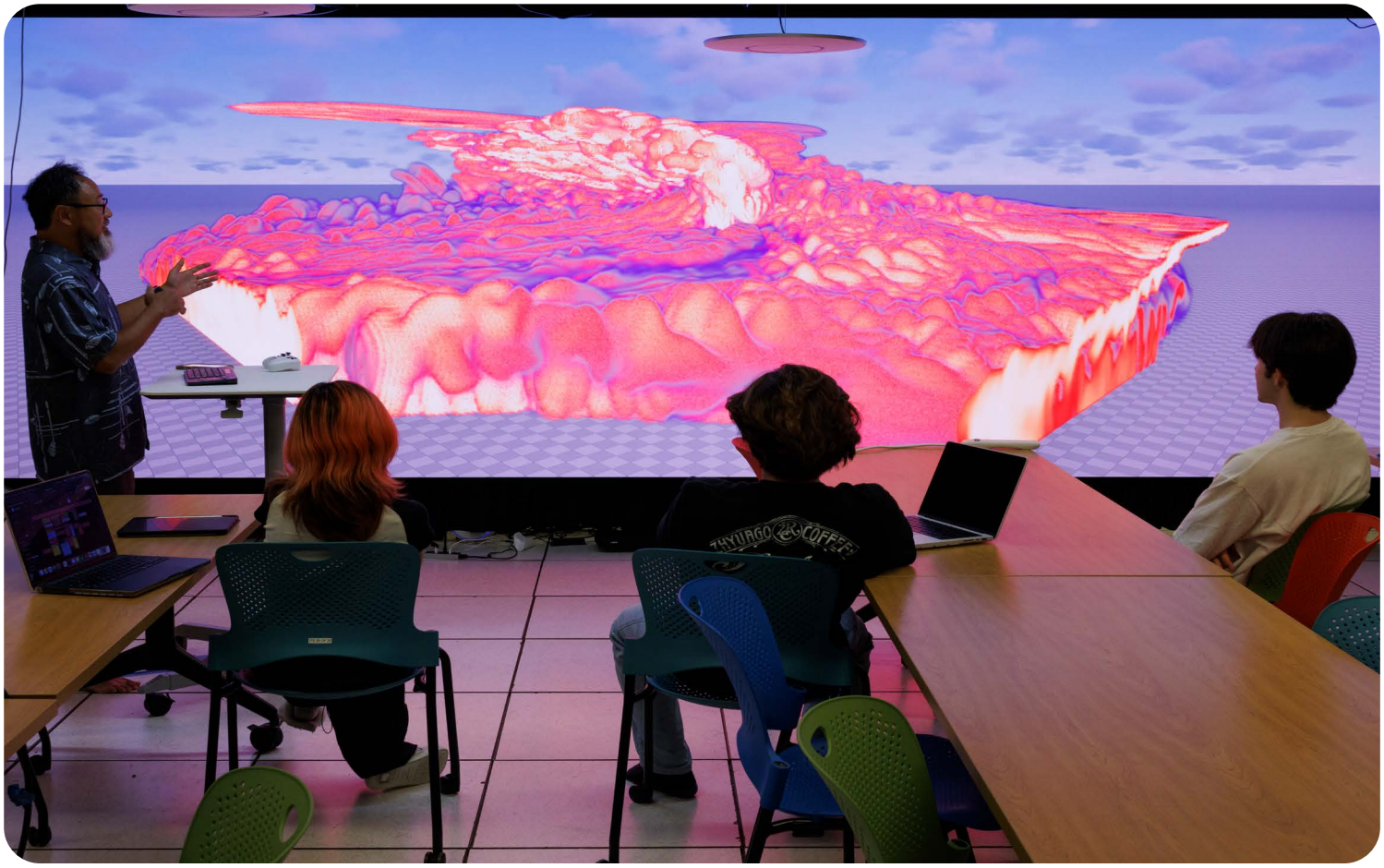
The lab was founded in 2014 by Jason Leigh, Ph.D., director of LAVA and professor of Information and Computer Sciences at the University of Hawai'i at Mānoa. Leigh is also co-director of the Hawai'i Data Science Institute and director emeritus of the Electronic Visualization Lab and Software Technologies Research Center at the University of Illinois at Chicago.

LAVA was initially served by a large Planar Clarity Matrix LCD video wall. In 2019, the lab upgraded to a Planar LED video wall. When 3D capability became available with newer models, LAVA upgraded again to a 20-foot-wide, 7-foot-high (10x6) Planar® DirectLight® Pro Series LED video wall with a 1.2mm pixel pitch. The research team was so pleased with its performance that it acquired a second DirectLight Pro Series LED video wall—a 15-foot-wide, 7-foot-high (8x6) array installed in an adjacent lab room. Both the LCD and the first LED video walls remain operational and have since been donated to the computer science department for continued use.

"We make very extensive use of the LED video walls for teaching classes in virtual reality, data visualization and video game design," Leigh explained. "But we also use them for research, outreach and to develop novel ways of communicating science to the general public."

The 3D capability of the LED video walls is enabled by a Colorlight Z8t video controller and processor. According to Leigh, the DirectLight Pro Series' high refresh rate is more than adequate to draw left and right eye images in sequence—a technique known as frame sequential 3D—and synchronize them with active 3D glasses.





Collaborative Learning in 3D

Virtual reality is among the subjects taught using the DirectLight Pro Series video walls, which serve as large 3D canvases for creating simulations. “Educationally, the displays are a fantastic substrate for students to brainstorm and see the bigger picture as their work takes shape,” Leigh said.

In his classes, Leigh runs SAGE3 (Smart Amplified Group Environment) open-source collaboration software on the LED video walls, allowing students to share content simultaneously across laptops, workstations and displays in different locations.

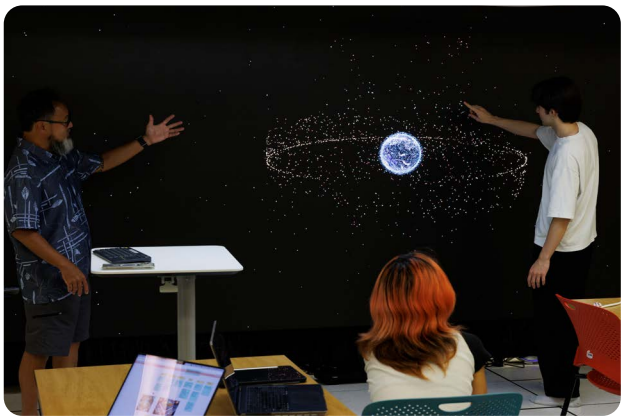
“The software runs great on the Planar LED video walls and we have a community of users who are involved,” Leigh said. “When we share ideas during classes on the LED video walls, it has the effect of inspiring other students and encouraging more participation.”

Leigh also said the DirectLight Pro Series video walls can help students experience information in a more visceral way. “This is especially true with 3D, which really immerses you in the space,” he said. “It creates that sense of awe, and that is one of the greatest powers of these LED displays.”

Beyond classroom instruction, LAVA makes the LED video walls available for training and workshops. One example was a space training program using visualization technology for the U.S. Space Force.

“We hosted a three-hour tutorial on the larger LED video wall that featured stereoscopic content and the use of SAGE3 collaboration software, and the trainees were completely blown away,” Leigh said.





Advancing Visualization Research

LAVA is putting the immersive visualization capabilities of the DirectLight Pro Series video walls to work on projects that can provide new insights into complex energy and scientific challenges.

One example is LAVA's partnership with the Hawai'i State Energy Office (HSEO) through a $1.8 million federal grant supporting continued development of Hawai'i's Advanced Visualization Energy Nexus (HAVEN) system. This interactive energy planning tool helps policymakers, planners and communities explore how decisions could shape Hawai'i's energy landscape, understand land-use tradeoffs and assess cascading impacts on energy systems and disaster preparedness. The DirectLight Pro's 3D capabilities will bring these complex relationships to life, making concepts that are difficult to convey through conventional charts and graphs easier to understand.

Another project focuses on climate research involving extreme storms and fire events. Within this area, LAVA researchers are studying pyrocumulus clouds—dense, cauliflower-shaped clouds that can form above intense heat sources such as wildfires or volcanic eruptions. "These clouds can shoot up into the atmosphere, spread vast distances and create new thunderstorms with the potential to spark additional fires miles away," Leigh said.

Given their three-dimensional nature, pyrocumulus clouds are particularly well-suited for study on the 3D LED video walls. Using software developed with the Unreal Engine, researchers can fly around them much like in a video game, providing a new perspective for examining these dynamic cloud structures, according to Leigh.

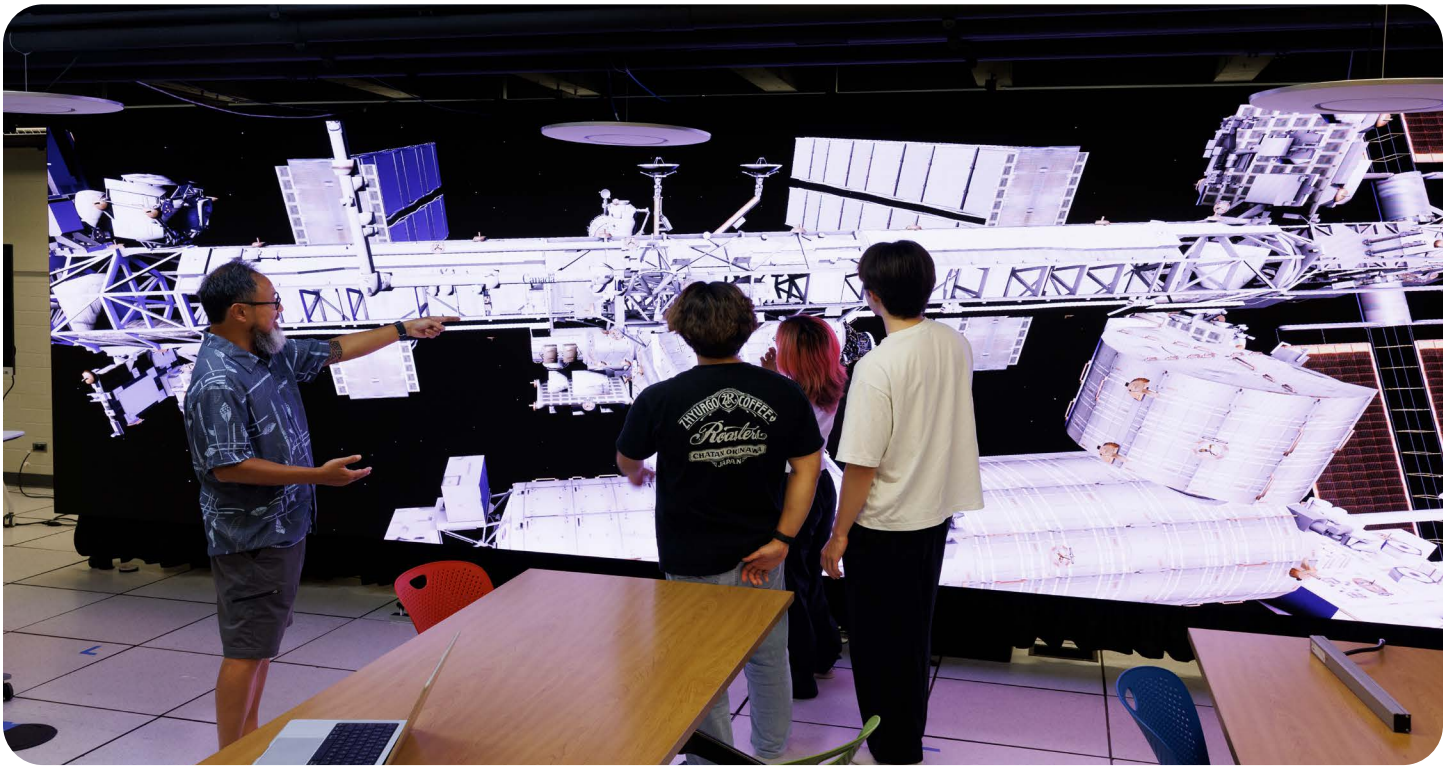
The 2023 Lahaina wildfire underscored the need to help scientists better predict the outcomes of these events, Leigh noted. "We're starting to see greater investment in this area based on the recognition that these kinds of technologies can help emergency response teams to be more prepared."



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Jason Leigh,

Director of the Laboratory for Advanced Visualization and Applications and Professor of Information and Computer Sciences, University of Hawai'i at Mānoa





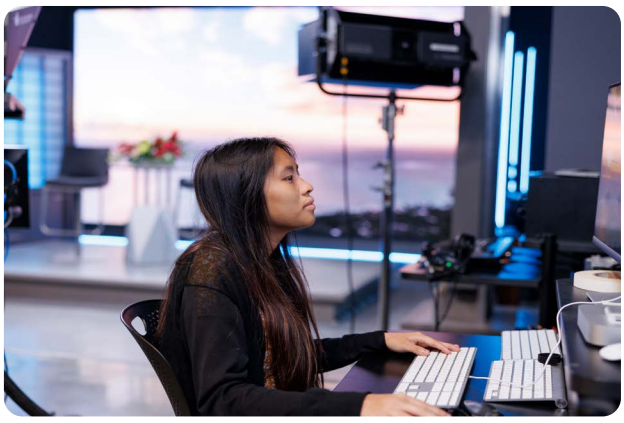
CSS Digital Studios

At another location on the campus, Planar display technology is being put to use in an entirely different way. CSS Digital Studios, operated by the College of Social Sciences, is a multimedia broadcast production facility that provides academic instruction and hands-on training in digital content creation, including broadcasting and video production.

Located on the first floor of the Sinclair Student Success Center, the studio is supported by a nearly 14-foot-wide, 8-foot-high (7x7) Planar LED video wall with a 1.8mm pixel pitch, creating a seamless background for on-camera applications. The LED video wall is flanked by two Planar 4K LCD displays in portrait orientation. The space also incorporates three-chip robotic cameras, allowing the display to be captured across a broad range of shots.

“Our program is broadly focused on training in broadcast media, live streaming and informational programming,” said Sherrie White, director of CSS Digital Studios. “We provide students with hands-on experience in a broadcast environment, including how to be on camera and interact with content on the screen while simultaneously speaking about a topic, whether it’s local news, election results or weather reports.”





Preparing Students for Real-World Experiences

Live sports streaming and production is an area of growing focus for the studio, according to White, especially with the University of Hawai'i at Mānoa recently becoming a full member of the Mountain West Conference. Crisis communications is another important direction.

"We do crisis exercises every year and invite real officials into the studio to participate," White said. "Students are given real-life scenarios developed by experts from organizations like the Pacific Tsunami Warning Center or the Pacific Disaster Center. It could be a simulated tsunami or earthquake. They will have about an hour to prepare and then they'll get in front of the camera as if they are addressing the public on TV. It's media training for a high-pressure situation."

The LED video wall also allows the studio to transition from a broadcast production environment to a teaching space. White uses the display to teach Adobe software and video editing, with the resolution of the LED video wall giving students a clear view of detailed on-screen information.

"Durability and looking great on camera are th0e most important aspects for us in a display, and the Planar LED video wall delivers both," White said. "The knowledge and support from the whole Planar team have also made a huge difference."

The Sinclair Student Success Center is currently undergoing a $65 million renovation that will transform the four-story, 115,000-square-foot building into a state-of-the-art facility. The project will add two larger Planar LED video walls to spaces on the first floor, one of which will support a new eSports arena with seating for 200.

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>
> **Sherrie White,**
>
> **Director of CSS Digital Studios, College of Social Sciences, University of Hawai'i at Mānoa**



About the Planar DirectLight Pro Series

Planar DirectLight Pro Series fine pixel pitch LED video walls deliver beautiful imagery to suit every indoor, fixed installation application. Offering 5x the bandwidth of competitive solutions, the displays reduce total cost of ownership and feature fewer cabinets, cables and internal components like receivers and power supplies. The solution is available with the Planar® WallDirector™ Video Controller which drives the video wall at native resolution, captures multiple 4K inputs and includes a web-based management software for simplified set-up, configuration, operation and monitoring.



PLANAR

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