University tech lab in Little Rock takes on virtual reality

By MARK CARTER - Associated Press - Monday, February 29, 2016

LITTLE ROCK, Ark. (AP) - Carolina Cruz-Neira's visualization technology lab in the Emerging Analytics Center at the University of Arkansas at Little Rock is a playground for the imagination. And the virtual reality that unfolds within it is helping envision better companies and cities - both modern and ancient - and even train better medical students.

Arkansas Business (http://bit.ly/1R4yQzk ) reports that Cruz-Neira is an internationally renowned virtual reality scientist who was recruited to UALR in 2014 by the Arkansas Research Alliance Scholars program, and the university is benefiting from her expertise and the industry credibility she brought with her.

Born in Venezuela and raised in Spain, Cruz-Neira has been on the forefront of VR since the 1990s. Before joining UALR, she established the Virtual Reality Applications Center at Iowa State University and the Louisiana Immersive Technologies Enterprise at the University of Louisiana at Lafayette.

Her EAC program at UALR is in its first full academic year, now grown to about 25 students and a faculty/staff leadership team of six. Cruz-Neira believes the program is starting to hit its stride. Throughout March and April, she and members of the team will continue their “world tour,” taking the VR programs developed in Little Rock to prestigious events and conferences on both coasts and in Europe. Cruz-Neira thinks the EAC team has made enough progress to show off a little in just the program's second year.

“Right now, our biggest challenge is to tell the world we are here,” she said. “Now we have enough stuff to take the show on the road. At some of these events, we're one of the main displays.”

Thanks to the addition of Cruz-Neira and her husband, EAC chief scientist Dirk Reiners, an expert in immersive virtual reality, UALR is beginning to emerge as a true VR player.

ARA President and CEO Jerry Adams said Cruz-Neira has not only been a valuable addition to UALR but to the research talent level of the state as well.

“Carolina has international credentials and contacts in a number of technology areas,” he said. “Recently, I introduced Carolina to a good friend who is involved with museum design worldwide and of course, Carolina has experience in that area too. Carolina has already made inroads into corporate Arkansas and has also recruited a top-notch leadership team also, all of this in less than two years.”

Last year, Cruz-Neira presented at the international Virtual Reality Summit in Santa Clara, California, alongside firms such as Adobe and schools such as the University of Southern California. She also led an EAC contingent to France where Reiners led a two-day session on VR software infrastructure.

The EAC crew will be busy this spring as well. Just having returned from the Engineering Reality of Virtual Reality 2016 conference last week in San Francisco, Cruz-Neira and her team will visit the 2016 EAST Initiative national conference in Hot Springs March 15-17; the Laval international conference in Laval, France, March 23-27; the GPU Technology Conference in San Jose, California, April 4-7; the Inside 3D Printing conference in New York City April 10-12; and then head back to the Bay Area for the Samsung Developers Conference in San Francisco April 27-28.

The UALR team will be displaying virtual reality tech that can be used in roughly 25 disciplines including large-scale, customized systems and “everyday portable technologies” such as smartphones, glasses and tablets, Cruz-Neira said.

The EAC has worked with private businesses including Nabholz Construction, WER Architects and Southwest Power Pool, and public entities such as the University of Arkansas for Medical Sciences and the city of Little Rock. Projects have included the design of a new exhibit for the Tulsa Zoo in partnership with Nabholz and a reimagining for the city of the South University Avenue corridor next to the UALR campus.

Businesses using the lab typically spend between $5,000 and $10,000 depending on the project, but costs can run much higher, Cruz-Neira said. Some projects entail scholarships, internships and consulting/research agreements, she said.
Chris Wright, director of virtual design and construction for Nabholz, called the EAC a cutting-edge technology asset that has helped the firm clearly communicate how a facility will look and feel with a “near real world visual presentation.”

“The visualization that the EAC created for the Tulsa Zoo Lost Kingdom Exhibit project helped create several conversations about specific features that enabled the project team to have a much clearer understanding of how to translate the client’s vision for the project into reality,” he said.

The EAC has transformed the corridor along University adjacent to campus into a walkable boulevard with a median and an elevated park-like walkway that crosses the street. Virtually, of course. The project has provided city leaders with a clear vision of what could be.

“The virtual reality presentation of what South University can look like in the future gives me, the city board, our city planners and the businesses along the corridor an exciting visualization of a ‘University District’ which needs to come of age in our capital city,” said Little Rock Mayor Mark Stodola, who personally donned the 3D glasses and toured the virtual University corridor.

UAMS students use the virtual reality in the EAC to step inside a 3D cadaver. Other medical applications of the VR technology include “anatomical eyes” that developers believe could change the way medical students are taught by providing hands-on anatomical exploration and an X-ray gown that uses augmented reality to visualize the inside of a patient’s body.

Non-medical applications for the technology used at UALR include interactive interior design; a 360-degree helicopter flight simulator; architectural explorations that enable users to explore environments before they’re built; urban planning; the ability to touch virtual objects with a robotic arm; an “immersive Google Earth” program that enables users to fly around the globe and even land on top of specific landmarks; and an augmented reality engine maintenance that guides users through repair procedures.

Perhaps the least expected application entails the reconstruction of sixth-century Arabian ruins excavated by UALR associate professor of anthropology Krista Lewis in Oman.

The EAC is distinguishing itself in other ways as well. It’s home to the only Cyberith VR treadmill in the U.S., on loan from the Austrian company while it manufactures a new one for UALR. The “treadmill” - valued at $10,000 to $15,000 - provides a fully immersive virtual reality environment in which users (that in this case mean gamers) can move freely and naturally, allowing for jumping and crouching, all at 360 degrees.

And because of the EAC, UALR is a member of a consortium of U.S. universities tasked with developing cybersecurity measures for the national power grid. The group, led by the University of Arkansas in Fayetteville through its National Center for Reliable Electric Power Transmission, was issued a $12 million U.S. Department of Energy grant for its work.

Other member schools are Carnegie Mellon in Pittsburgh, Lehigh University in Bethlehem, Pennsylvania, and Florida International University in suburban Miami.

The goal of the project is to bring together the EAC’s virtual reality with artificial intelligence and sophisticated computer algorithms into an integrated visual environment, Cruz-Neira said.

“This will help officials better recognize and understand, and then respond to, cybersecurity threats to the grid,” she said.

Plus, EAC student Juan Sebastian Munoz, a doctoral candidate from Colombia, competed against students and developers from across the globe and won the community favorite award in the industry-prestigious Leap Motion 3D Jam 2015 contest with his PotelRVR program that simulates pottery making.

His project also made the top eight in another VR contest last year in Europe. With a 3D printer, Munoz can even conjure up a physical representation of what he creates in the program.

“Projects like these are door openers,” Cruz-Neira said. “They open the door to show people how we can use virtual reality for design.”

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