



Louisiana State University's Digital Media Center

Highlights

Location

Baton Rouge, Louisiana

Industry

Education

Application

Virtual Production &
Extended Reality

Partners

Epic Games

LSU Builds New Virtual Production Studio With OptiTrack System

Louisiana State University (LSU) was awarded a five-year \$1.25 million grant from Louisiana Economic Development to establish the LSU Virtual Production Program, a dedicated curriculum and production environment to cultivate a new generation of students fluent in the technologies and approaches of emerging media filmmaking. Following the grant, the university opened a new virtual production (VP) studio. Located at LSU's Digital Media Center, the studio provides students with the opportunity for hands-on learning experiences using VP methods.

Several LSU programs are involved with the new studio including Digital Art, Film & TV, Experimental Music & Digital Media, Screen Arts, Digital Media Arts & Engineering, Electrical Engineering and Computer Science, as well as the LSU Center for Computation & Technology. The studio itself is outfitted with the latest equipment and technology in VP. The setup includes an LED volume consisting of a 20-foot-wide by nearly 10-foot-high LED video wall that is powered by Unreal, in addition to other technologies.

For camera tracking and motion capture, LSU selected an OptiTrack camera tracking system with eight Prime^x 22 cameras. Featuring edge-to-edge coverage across any capture area, the OptiTrack system delivers stunning camera-to-marker range and 3D accuracy.

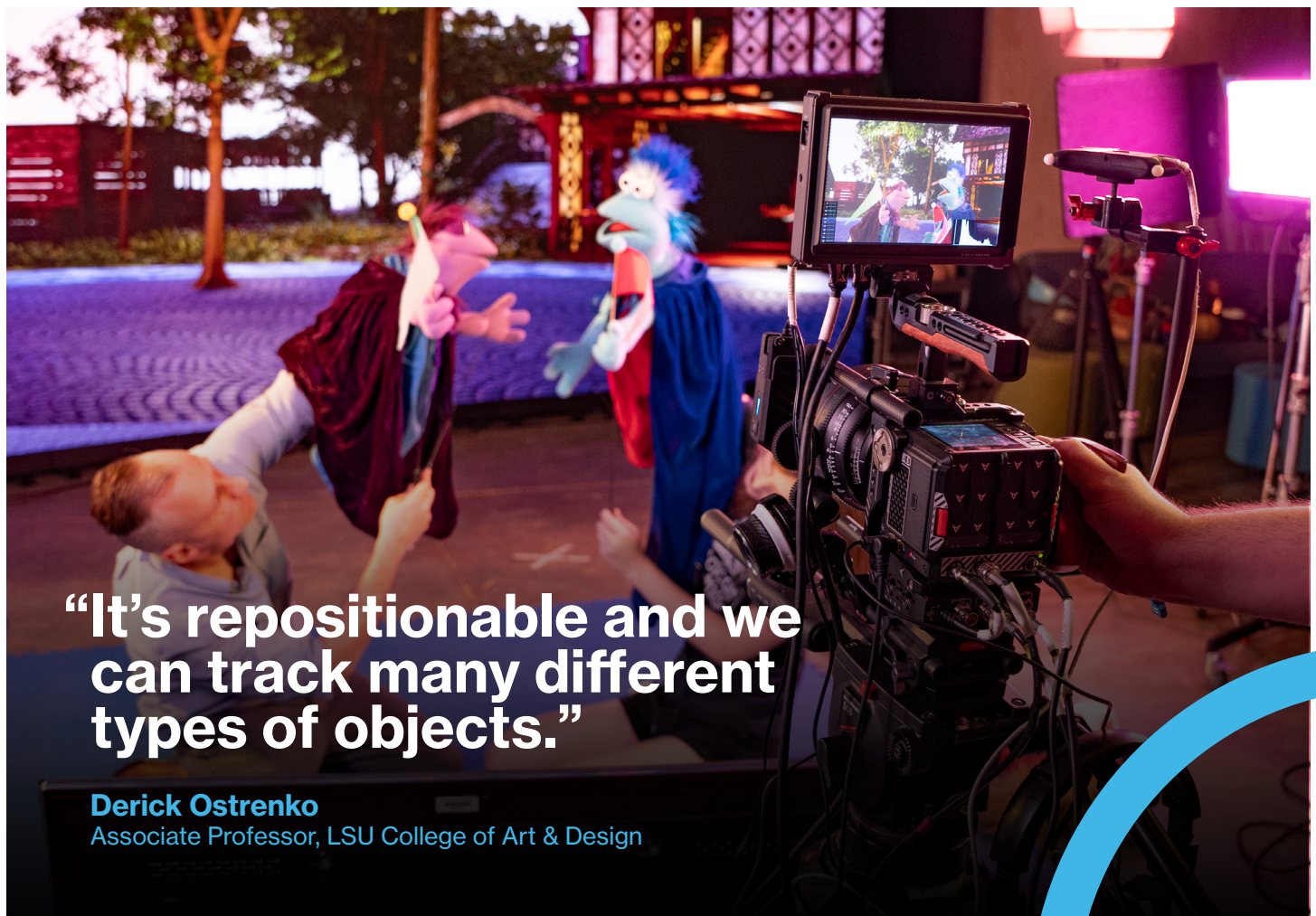
Also included is OptiTrack's CinePuck—a high-end, optical-fused inertial measurement unit (IMU) tracking tool for VP studios that can be seamlessly integrated into any production workflow, even crowded rigging configurations, using a variety of mounts.

“The grant allows us to not only build out the hardware, but also plan more long-term,” said Derick Ostrenko, associate professor at the LSU College of Art & Design. “We are developing degree programs and curriculums, and have been teaching foundational classes in Unreal Engine, filmmaking and production. More recently, we’ve created classes covering different techniques of VP as well as extended reality (XR) performance using motion capture.”

Since opening, interest in the virtual studio has grown across campus. “It really has broad appeal,” said Marc Aubanel, director of Digital Media Arts & Engineering at the LSU College of Art & Design. “We’ve had several programs inquire about the studio, from the English department to Athletics which is looking at potentially using it for recruiting.”

Jason Jamerson, LSU assistant professor of Virtual Production and Immersive Media who holds a joint appointment in the School of Art and the School of Theatre, has been using the virtual studio to teach film production classes. “We’ve created music videos, documentary segments and have shot tests for weather, commercials and infomercials,” Jamerson said. “The ability to track the camera and get parallax offers so many advantages over a green screen. I’m planning on moving my film production class to the studio so we can work with the equipment full time.”

The new studio has also opened the door to exciting collaborations. NASA awarded LSU \$5 million to create a digital twin of the main factory at Michoud Assembly Facility which provides vital support to NASA exploration and discovery missions. Using OptiTrack, Ostrenko, Jamerson and Aubanel lead the development of a real-time digital representation connecting the real location to the digital one and enabling space industry professionals to test designs at the VP studio from anywhere in the world. The experience also led to the development of a class on digital twinning.



“It’s repositionable and we can track many different types of objects.”

Derick Ostrenko
Associate Professor, LSU College of Art & Design



The Advantage of a Multifunctional System

Prior to building the studio, LSU evaluated a range of VP equipment and technologies as part of their selection process. For a tracking system, the team was intent on acquiring a robust solution that could handle a lot of use cases, according to Aubanel. “We needed to track cameras, but we also wanted the ability to track people and objects,” he said.

They talked to multiple vendors and looked closely at two options, both of which were single-solution products. “They worked great, but each system could only solve one problem,” he said. “For example, you could track a camera but nothing else.”

With OptiTrack, they found a solution with the flexibility for multiple applications. They also get the benefit of a tracking system that is optimized for low latency throughput into Unreal. “Obviously, for live and virtual production, latency is very important,” Aubanel said.

XR Performance

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Outside the realm of VP, LSU has developed classes in XR performance using OptiTrack for motion capture in unison with live productions such as musical concerts, theater and dance. PhD students from the Experimental Music & Digital Media program partnered with students from Digital Media Arts & Engineering to use the system for live events. This included tracking dancers and recreating the choreography with avatars using Unreal Engine in real-time. “We did everything from aerial silks to standup comedy to interpretive dance and generative visuals,” Ostrenko said.

A System to Grow With

OptiTrack was appealing to LSU in that they could acquire a system at a reasonable cost, then build it out depending on the directions they decide to take. “If we want to expand our volume, we can just add more cameras,” Ostrenko said. “It’s repositionable and we can track many different types of objects.”

The system also gives them the optionality to experiment and try new things—ideal for a university environment. “For instance, we are interested in doing measurements in virtual space by placing markers on the corners of the LED video wall or on top of lights,” Ostrenko said. “There is a long history of researchers and scientists working with motion capture. It’s a closed system, but it has a lot of ways of interacting with the data that comes out. From a research institution point of view, it’s appealing to explore things that people haven’t really done before or figured out yet.”

