

FEATURED

Research Symposium showcases innovation, creativity at DSU

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Mar 23, 2024

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TATE CARSON, left, assistant professor of digital sound design, showcased the sonic atmospheres of South Dakota stat "Resonant Soundscapes."

Photo by Zac Zwaschka



Each year, Dakota State University's students and faculty have a unique opportunity to present their work to the public through the annual DSU Research Symposium. The event was held Wednesday in the packed collaboration center of the Beacom Institute of Technology.

The symposium is one of the key events of DSU's Research Week, which also featured their Sanford Health-sponsored Data Analytics Competition on Monday; DakotaCon, "DSU's flagship cybersecurity conference," on Friday; and more. The week's keynote speaker was Jen Easterly, director of the cybersecurity and infrastructure security agency (CISA), who presented at the Dakota Prairie Playhouse Friday morning.

"This year is particularly special as we celebrate the 40th anniversary of our mission change, marking four decades of unparalleled commitment to research, innovation and academic excellence," DSU's Vice President for Research and Economic Development Ashley Podhradsky wrote in the symposium's program.

For DSU, the symposium is a chance to showcase the innovation and creativity present at the school across multiple levels of education and a wide variety of disciplines. Topics ranged from AI-generated political ads to video game development to soundscapes captured from South Dakota's state parks and much more.

One of these projects was "Resonant Landscapes," which was presented by Tate Carson, assistant professor of digital sound design, and one of his undergraduate students Carter Gordon.

Carson explained that the project is an interactive sound art installation that immerses users in the sonic landscape of South Dakota's 13 state parks. Carson and his team used ambisonic field recordings, which are capable of capturing 360-degree audio, to recreate the parks' soundscapes on a scaled map of state that spans across DSU.

With a smartphone and headphones, participants can access the recordings through a special website, and as they walk around the campus, the soundscapes will grow in volume as they move toward designated listening locations. The soundscapes themselves features recordings of phenomena like geese honking over Lake Herman, prairie dogs at Custer State Park and ice cracking on bodies of water.

Carson commented that one his research interests is studying the sound of the environment to gain a deeper understanding of its characteristics.

"I'm also interested in its capability to restore our attention, like attention restoration, sort of like health and wellness aspects of a healthy environment free from noise pollution and stuff like that," Carson said. "I just really enjoy spending time in nature, and this is my way I work it

into my field of teaching and study."

Additionally, Carson and his students used these recordings as the foundation for a series of musical compositions, which will be showcased at a free concert at the Madison Area Arts Council's BrickHouse venue on Tuesday at 7 p.m.

Another project that revolved around nature was presented by DSU undergrad Denyce Bravo, who studied the antimicrobial potential of honey from alfalfa against both human and plant pathogens.

"I learned that alfalfa honey is really good at stopping the growth of E. coli and staphylococcus aureus (the bacteria behind staph and other infections), so those are the human bacteria, but as we can see here, for the plant bacteria, there is low antibacterial potential, meaning alfalfa honey doesn't really stop the growth of plant bacteria," Bravo said.

"I'm guessing here that the plant bacteria develops some type of resistance against the honey because they're more exposed to it," she said. "I also figured out that alfalfa honey contains a low amount of proteins."

Bravo's research was conducted under the mentorship of Andrew Sathoff, assistant biology professor and science program coordinator.

"I think it's really good to acknowledge the potential of alfalfa honey because I know right now we have a crisis in the antimicrobial resistance problem all around the world, so we're trying to figure out other solutions, not just pharmaceutical drugs, but some natural products as well to solve this problem," Bravo said.

Bravo's presentation was emblematic of one of the symposium's key goals, preparing DSU's students for the wider world of academic research. While many of the presenters are faculty members and graduate students with more advanced experience, others, like Bravo, are publicly presenting their research for the first time.

"This symposium is really good practice for me because I'm going to a very big conference to present this research in Atlanta in June," Bravo added, with the conference in question being for the American Society of Microbiology.

Some of the other projects dived more to the arts, such as undergrad Autumn Meyer. Meyer presented her animation portfolio "Zodians," which seeks to tell the story of a girl travelling through a fantasy world inspired by mythological creatures from different parts of the world along with the Greek zodiac signs. Her mentor for the project was Daniel Seman, an assistant professor in the College of Arts and Sciences.

"I've been doing animation for quite a while. I started drawing I believe when I was three," Meyer said, adding that as she got older, she started experimenting with digital mediums. "I just kind of fell in love with it."

Regardless of profession, a connecting thread of passion could be seen throughout the event, which totaled five faculty projects, eight graduate projects and 19 undergraduate projects.

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