Researchers re-create landmark 17th century cathedral, speech in virtual space

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(Phys.org) —Researchers at North Carolina State University have combined scholarship and new technologies to re-create the courtyard of St. Paul's Cathedral in London as it stood in 1622, as well as a historic sermon made by poet John Donne in the courtyard. The project, which is a significant research tool for history, literature and religion scholars, is available online and can also be viewed in a state-of-the-art theater that

offers a 270-degree view of the courtyard with high-fidelity acoustics.

"This is as close as you can come to visiting 17th century London and hearing John Donne speak without a time machine," says Dr. John Wall, a professor of English at NC State and leader of the Virtual Paul's Cross Project. The theater installation was unveiled Nov. 5 in the Teaching and Visualization Lab in NC State's Hunt Library, which was designed for high-definition visualizations and simulations.

The project is already helping to answer longstanding and fundamental questions about religion and literature in 17th century London. "We know that large crowds showed up to hear Donne's sermons, but it was unclear whether they could even hear what was being said," Wall says. "By using the models we created for this project, we learned that the courtyard space allowed sound to reverberate, amplifying the voice of the speaker. This also means the sermon had to be delivered at a measured pace to keep the speech from being garbled as the reverberating sounds overlapped. Those are insights we wouldn't have without this project."

The researchers focused on John Donne, best known as a poet, because he was also an important religious and political figure in 17th century London. Due to the Reformation and its aftermath, religion and politics were inextricably linked in England during this period. As dean of St. Paul's Cathedral, a focal point of social, political and religious life in the largest city in England, Donne was a prominent man – and his sermons were often made in defense of royal policies, to the most influential crowds in the country.

Wall launched the Virtual Paul's Cross Project, with funding from the National Endowment for the Humanities, to find out what it would have been like to be there for one of those sermons.

Wall worked with David Hill, an associate professor of architecture at NC State, to recreate the part of St. Paul's churchyard where Paul's Cross was located. The team had to rely on historic documents and images, since the cathedral burned to the ground in 1666. Paul's Cross was a freestanding outdoor pulpit where crowds would gather to hear sermons on Sundays and special religious days. And it was from Paul's Cross that Donne preached a sermon, on Nov. 5, 1622, that is recreated by the project itself. Video of the visual recreation is available below:

Wall and Hill also worked with linguistics and acoustics experts to create

a script and acoustic model able to simulate the way the sermon would sound depending on where you are in the churchyard – or under different conditions, such as standing in a small crowd or a large one.

"We actually constructed two separate models: one for visual representations and one for audio representations," Hill says. "The visual model shows a greater amount of the architectural detail that is common to Gothic cathedrals. The sound model has acoustical properties like reflectance and absorption assigned to the various materials, such as stone, glass or brick. These are things that may not be visually apparent in the model, but they contribute to an accurate portrayal of sounds within the space."

Anyone can explore the visual and acoustic models at the Virtual Paul's Cross Project online at vpcp.chass.ncsu.edu/. The project can be viewed in person at the Teaching and Visualization Lab by appointment.

More information: vpcp.chass.ncsu.edu/

Provided by North Carolina State University