



Gorffennol Digidol Digital Past - 2021

DESIGNING HEAD-WORN AR EXPERIENCES FOR CULTURAL HERITAGE

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The Virginia Tech campus includes the historic site of Solitude, a plantation home originally built in 1801 and expanded until the 1850s, and eventually converted after the founding of Virginia Tech to serve several different purposes. Our work aims to uncover the hidden histories of this site and bring to life the events and people who lived here through an augmented reality tour. The decision to do this in head-worn augmented reality came from a desire to apply the affordances it could offer in contrast to creating a physical exhibit or printed brochure.

Since this application of augmented reality is novel, there have been many design choices to make. We will cover some of these choices, as well as lessons learned so far. Questions about the design include: 1) where to present the content, with options such as being inside or outside the structure, and whether content should be tied to real objects or free floating; 2) how to guide the user's navigation of the site, since content is often placed in a specific location rather than relative to the user's gaze; and 3) what enhancements are afforded by head-worn AR that create a more engaging experience.

Our immersive experience designs stem from these questions and offer guidelines for other designers using augmented reality for digital cultural heritage. Our solutions include directing user gaze as well as walking using subtle cues and spatial audio. Additionally, we

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use the natural affordances of AR to show change over time by contrasting historical images with the present day through overlays. Lastly, we cover some of the ideas that did not work: some due to technical limitations, others based on results from pilot studies, and others related to fitting the overall vision of the tour as it evolved.

Biography

Nicolas Gutkowski is a master's student in computer science researching the intersection of cultural heritage and XR.

Doug A. Bowman is the Frank J. Maher Professor of Computer Science and Director of the Center for Human-Computer Interaction at Virginia Tech.

Todd Ogle is the Executive Director of the Applied Research in Immersive Environments and Simulations program and in the University Libraries and an associate director for Immersive Experiences in the Center for Human-Computer Interaction at Virginia Tech.