



Artifacts and Artfiction | Two years of Historical Preservation with Benj. Harrison Presidential Site

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Abstract

In 2016, the Benjamin Harrison Presidential Site, based out of Indianapolis, contracted our class N420 Project Development to produce a virtual museum to become known as *The 23rd Floor*. Virtual reality systems allow interaction with 3D replicas of artifacts that are normally not able to be displayed due to quantity of historical artifacts and insufficient space to display them in. The University Library's Center for Digital Scholarship was instrumental to providing digital scans that provided the foundation to recreate authentic replications of over 50 assets inside the growing virtual museum.

History

The Benjamin Harrison Presidential Site, located inside the former home of President Benjamin Harrison, has kept and preserved the numerous artifacts collected throughout the life of U.S. President Benjamin Harrison.

In order to give these significant artifacts their time in the sun, our group was asked to help create a creative medium to visualize them. The Benjamin Harrison Presidential Site understands that interactivity and technology is a growing trend for historical sites, and challenged the team to set a precedent for how audiences interact with history.

Methods – Prepping Digitized Artifacts

Scan – The University Library's Digital preservation department would scan selected artifacts using a Creaform GoScan that captures 3D surface and color data.

Clean – Once captured the team would clean any artifacting or imperfections in the scans to prepare the meshes to become game engine ready.

Retopologize – Once cleaned the models get duplicated and made efficient in a process known as retopology. Polygon counts are significantly reduced.

Unwrap – The new meshes are prepared to accept their original surface detail and color by laying out 2 dimensional patterns that represent the 3 dimensional shapes.

Projection – Projection allows the healed scans to push detail onto the efficient/ retopologized mesh.

Bake Detail and Color – Once projected, the efficient mesh can export 3D, texture, bumpiness, and shininess attributes to game engine. This is know as 'baking' the texture data.

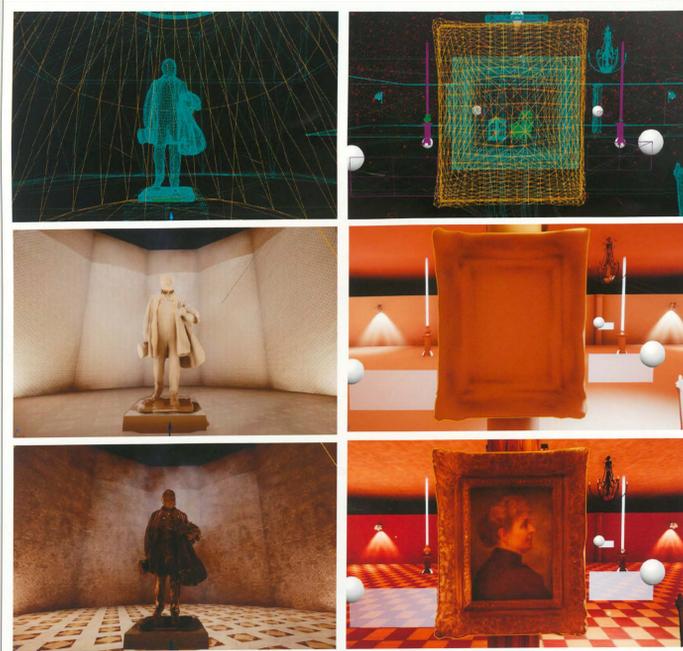
Artifacts and Artfiction - Behind the Scenes



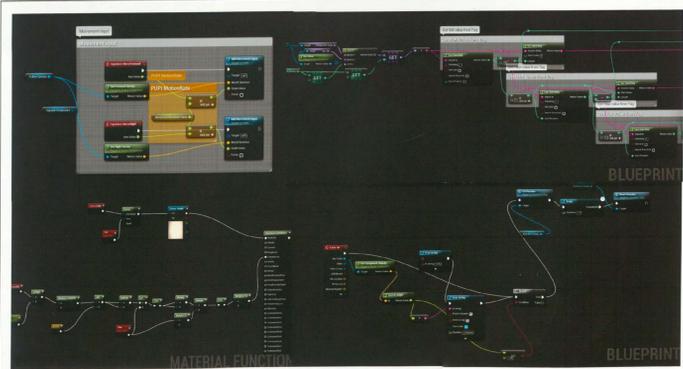
3D Scan Digital Healing Added Color



The 23rd Floor, Virtual Presidential Museum



Navigation, Interaction & Shading Logic



Methods– Building a Virtual Museum

Design & Modeling – In close concert with Benjamin Harrison Presidential Site Leadership a blueprint for the museum display environment was designed and built to be scalable as more artifacts are digitized.

Texturing and Shading – The fictional surfaces, materials and objects were sourced primarily for ambience, to enhance the audience's suspension of belief when stepping into the past.

Lighting – Dramatic Lighting and eventually light volumes were added to highlight the locations of important artifacts and also enhance the experience past what a museum can do in reality. Special attention was given to "jewel casing" items to maximize aesthetic appeal.

Navigation & Interaction – Advanced navigation to walk, teleport and gaze through the virtual museum was created last. Depending on the users VR hardware (or lack there of) audiences will be able to teleport through the FULL VR experience, walk through the space with advanced inputs with the OMNI VR Treadmill, or GAZE with their eyes and head direction to 'jump' to locations or objects of interest when using VR headsets.

Sound – It was apparent early that without ambience the space felt and sounded flat. Future work could add a curator to describe the significance and rich history of each object.

Quality Assurance – The 2018 team was responsible in ensuring quality of each artifact, and the entirety of the experience to ensure consistent use of files, methods, and recreations of past and future models. The team leaves future student groups with solid documentation and a way for the public to receive updates each semester.

Collaborators

Charles Hyde – CEO and N420 Client, originator of The 23rd Floor concept, provided context, time, and direction.

Jennifer Capps – The curator of the President Benjamin Harrison Presidential Site, provided direction and historical sources for our work.

Tyler Jackson – AVL, Scanned Artifact Workflow Documentation

Jennifer Johnson – Center for Digital Scholarship, University Library

Jeff Maurer – The President and CEO of Virtual Xperience provided technical assistance and best practice information.

Zebulun Wood – The professor/advisor for both previously separate teams, as well as current combined team. We could not have made it this far without his help and guidance.

N420 Students
Levi Conklin, Dakota Cooper, Ken Allen, Scott Umstead, Rob Sunderlin, Kennedy Davis, Tori Roessler, Justin Abbott Sylvester, Andrew Bush, Mikoto Watanabe, and Brandon Raleigh
 The contributions of these students were essential to the current state of The 23rd Floor.