

VIRTUAL BETHEL AME GUIDE

A comprehensive guide to the Virtual Bethel Project.

What is Virtual Bethel?

Virtual Bethel is a Virtual Reality experience that was made in collaboration with the School of Informatics and Computing (SOIC) of IUPUI with the Bethel African Methodist Episcopal Church in downtown Indianapolis. After Bethel AME was sold due to financial hardship, Rodney Freeman, an SOIC alum and church member, reached out to SOIC to help digitally preserve this historic landmark while allowing for the content to be interactive virtually.

Purpose of the Virtual Bethel Project

The church itself is a significant artifact in understanding African American history in Indianapolis, as it served as a community center and religious gathering site. Founded in 1836, Bethel AME was the oldest African American church in Indianapolis and was the oldest building on the Indianapolis Central Canal. Given its extensive history, the church members as well as the community at SOIC found it imperative to document and preserve the site for future community members as well as Indianapolis citizens.

Intention of the Project

For both the congregants of Bethel AME and the researchers in the School of Informatics, it was important to foster a bond of trust toward SOIC, with the underlying understanding that, historically, African American communities have been misrepresented or otherwise harmed in academia and research. The collaborative nature of this project promotes vital input from the AME community, especially Bethel's Keeper of History Olivia McGee-Lockhart, as the digital experience was being built to remain true to the physical experience as well as the experience of the congregants.

The files and their use are for the purpose of preservation and education, without commercial exploitation or otherwise harmful behavior.

Project History

2013 - the Bethel Archive came to the attention of the Department of Library and Information Science through a grassroots organization, whose mission was to promote digital preservation in the African American Community in Indianapolis

2016 - in collaboration with IUPUI University Library and the Indiana Historical Society funds were obtained through the Indiana State Library to digitize the archive

2016 - Bethel Archive digitized via a LSTA (Library Services and Technology Act) grant and uploaded to <https://images.indianahistory.org/digital/collection/p16797coll9> in a digital partnership between IHS (Indiana Historical Society), IUPUI University Library, Indiana State Museum, and Bethel A.M.E. (https://www.in.gov/library/files/2016_LSTA_Grants_Summary.pdf)

Fall 2016 - funds were raised to pay a private company to complete a 3D scan of the church and hundreds of photographs were taken to document the interior of the church

Media Arts and Science faculty and students created the Virtual Bethel – the 3D Virtual space of the Bethel Church

2017 – team received funding and completed the work to combine the digitized archive with the virtual sanctuary to create a learning space; photography and scanning was completed in September 2017

2018 - The preserved experience was created on April 4, 2018

Digital Preservation

For initial fixity information, we used a simple free software, HashMyFiles, http://www.nirsoft.net/utils/hash_my_files.html

We used JHOVE to identify, validate, and characterize the file formats

Other Locations of these Files

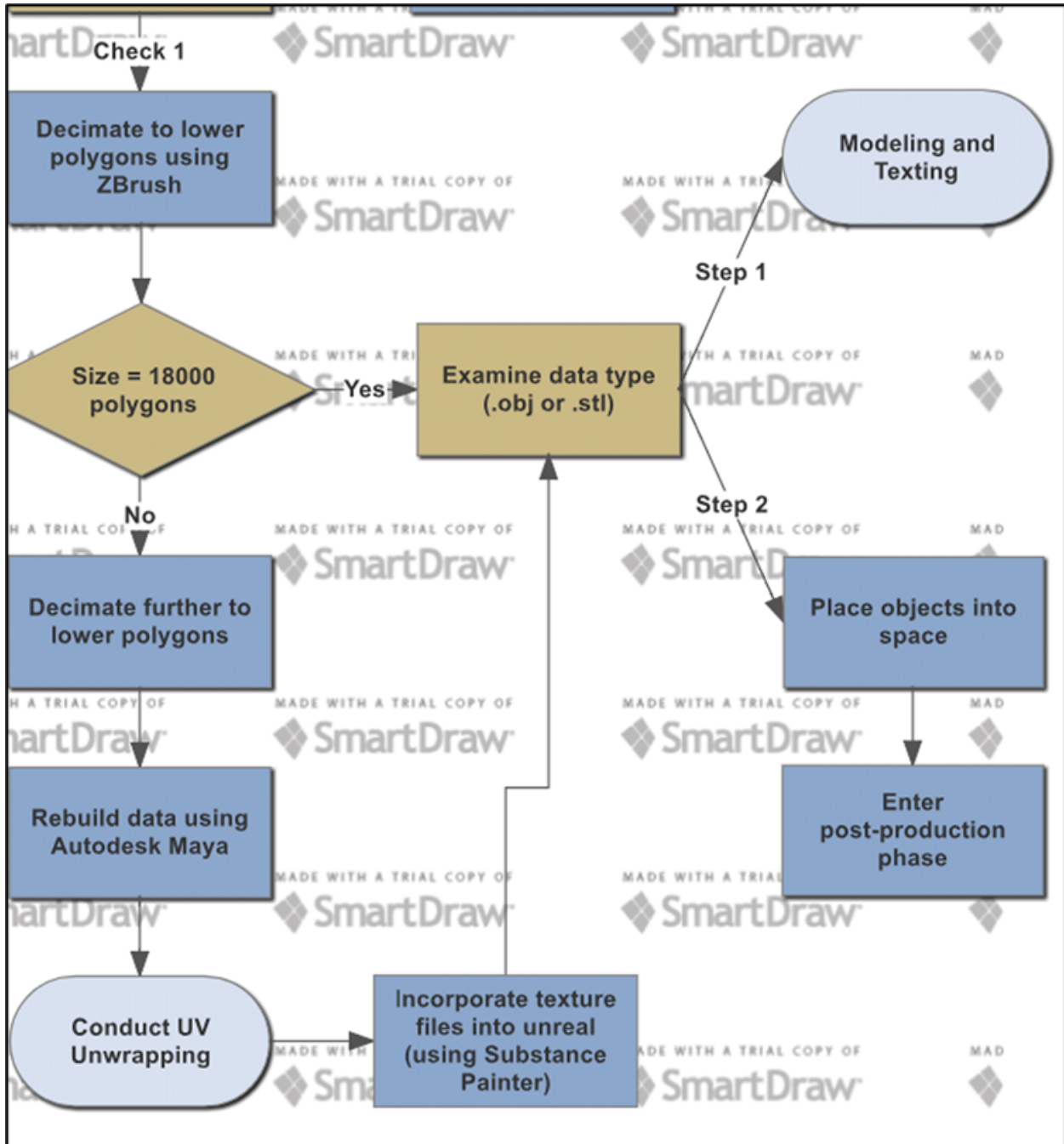
The files and the overall experience may be accessed at the following link along with other supplementary information about the project, its team, and Bethel community: <https://bethel.luddy.iupui.edu/>

Crucial Context: Before Interacting with Files

Before interacting with the files, it is vital to maintain the file structure as you receive it in order to accurately run the project without any errors. The file structure is created in a way that

the engine requires referencing specific file placements that provide for different parts of the experience as a whole.

Workflow Diagrams



Production Pipeline

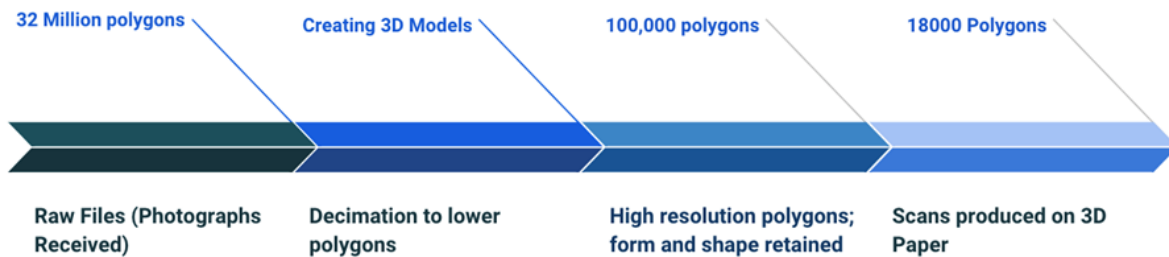
- 3D Model
 - Unwrap to prepare for texturing
- Texture (color, shine, bumpiness & details)

- Lights / Shading
- Incorporate into Game Engine
- Publish

Production Checklist

- First Create 3D Models
- Add Color to them
- Intensive Autonaming
- .stl & .obj files obtained - worked across all softwares
- .ztl -proprietary to Zbrush (used to sculpt and take details from objects)
- Photos opened in Adobe Photoshop
- Unreal project firstly edited
- Main recreation tool - Autodesk Maya
- .fbx production - works with a huge variety of data
- Moved from Maya to Unreal fro deliverables
- .tga - target files is uncompressed

Digital Scan Process Line



File Type Inventory

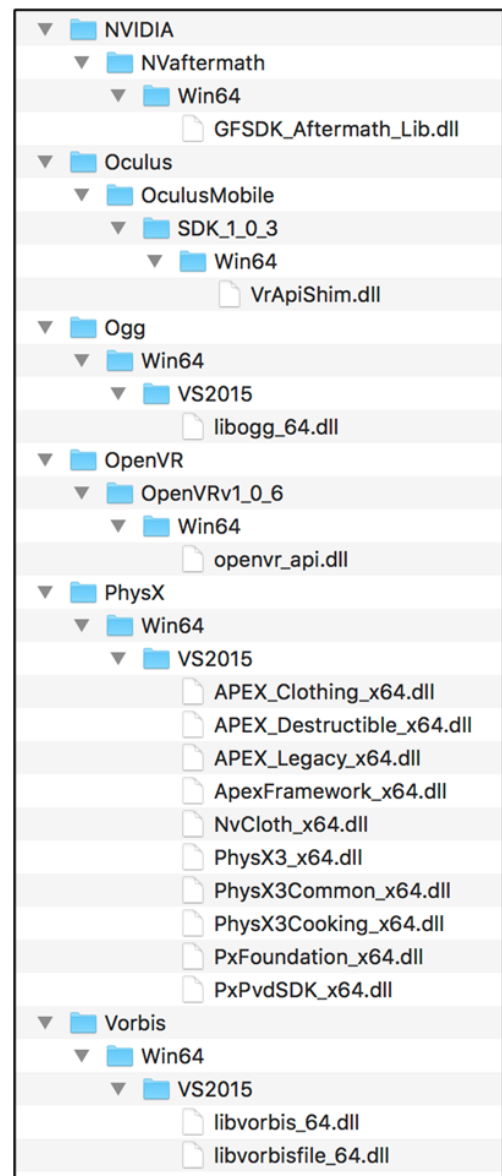
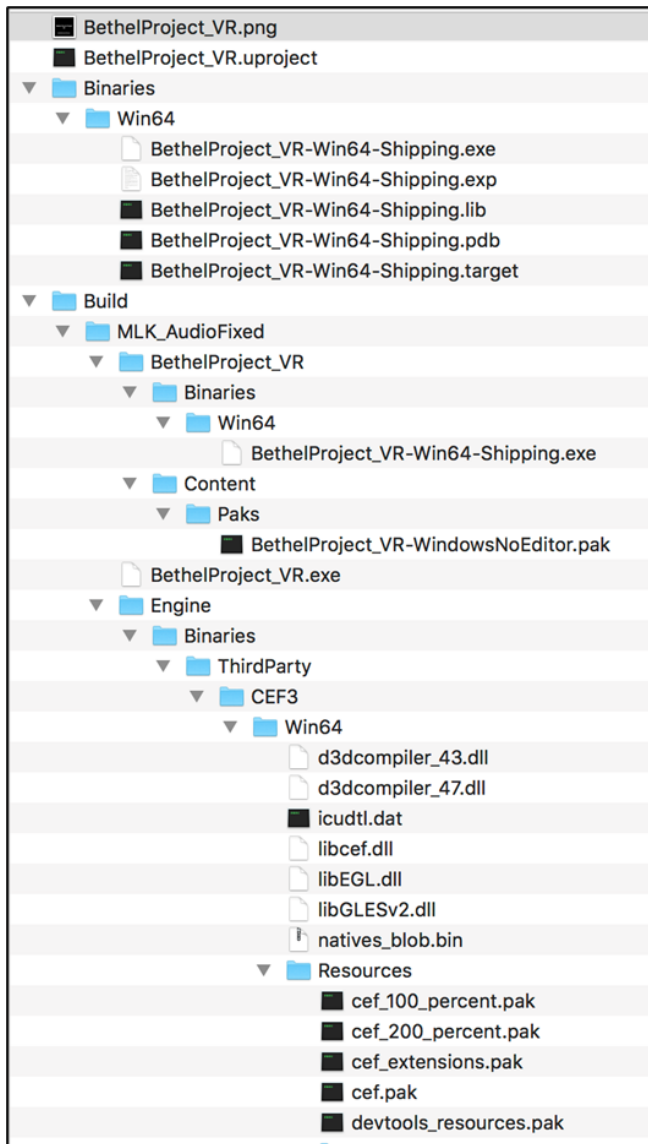
File types organized by greatest to least amount of storage space taken as well as number of specific types of files.

- .jpg > 33,700
- .cr2 > 718
- .mov > 65
- .stl > 1
- .tif > 3
- .mp4 > 2
- .obj > 2
- .ztl > 2
- .txt > 8
- .png > 3
- .gigapan > 3

- .xlsx > 2
- .docx > 1
- .info > 3

Total Number of files: 34,513

Folder Structure



There are three distinct collections of files:

- Pre-production
- Production
- Post-production (executable)

Technology Used

Hardware:

- [HTC Vive Virtual Reality Kit](#)
- Compatible PCs
- Surphaser—3D Scanner (property of Online Resources, Inc.)
- GigaPan Robotic Capturing System
- Ricoh Theta Camera
- 100 mm Surfacar LiDAR Laser Scanner

Software:

Retopologizing of the Scan

- Pixologic Zbrush

3D Modeling Software Used

- Autodesk Maya

3D Unwrapping Software Used

- Autodesk Maya & Headus UV Layout Pro

3D Texturing Software Used

- Adobe Photoshop

Physically Based Rendering Texturing Software Used

- Allegorithmic Substance Painter & Designer

Game Engines Used

- Epic Unreal Engine
- Unity Game Engine for comparison

Software Recommendations

Software Recommendations made as of September of 2022.

STL files (stereolithography); file format created by 3D systems for its CAD software; mainly used for 3D printing, rapid prototyping, and computer-aided manufacturing

- FreeCAD
- Blender
- MeshLab
- Autodesk MeshMixer
- SketchUp
- SculptGL
- 3DSlash

OBJ Files; Wavefront 3D Object File used for a three-dimensional object containing 3D coordinates, texture maps, and other object information; contains a standard 3D image format that can be exported and opened by many 3D image editing programs

- 3DReshaper
- 3ds Max
- Autodesk Maya
- Adobe Photoshop CC
- Stuffit Expander
- progeCAD Professional
- Parallels Tools Center
- Wavefront

Further Readings

Wood, Z. M., William, A., & Copeland, A. (2019). Virtual Reality for Preservation: Production of Virtual Reality Heritage Spaces in the Classroom. In "3D/VR in the Academic Library: Emerging Practices and Trends". Available at

<https://www.clir.org/wp-content/uploads/sites/6/2019/02/Pub-176.pdf>

Wood, Z. M., William, A., Yoon, A., & Copeland, A. (2018). Virtual Bethel: preservation of Indianapolis's oldest black church. In *Research Methods for the Digital Humanities* (pp. 195-210). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-96713-4_11

Murillo, A. P., Spotts, L., Copeland, A., Yoon, A., & Wood, Z. M. (2018). Complexities of digital preservation in a virtual reality environment, the case of virtual bethel. *International Journal of Digital Curation*, 13(1). <https://doi.org/10.2218/ijdc.v13i1.631>

Copeland, A., Wood, Z., Spotts, L., & Yoon, A. (2018). Learning through virtual reality: Virtual Bethel case study. *iConference 2018 Proceedings*. Available at <http://hdl.handle.net/2142/100230>

Copeland, A. The Bethel AME Church Archive: Partners and participants. In Roued-Cunliffe, H., & Copeland, A. (2017). *Participatory Heritage*. London: Facet Publishing.

Primary sources

Collections held by the Indiana Historical Society

Bethel A.M.E. Church Records M1240;
Bethel A.M.E. Church Addition M1270;
Bethel A.M.E. Church Board Minutes F0597;
Bethel A.M.E. Church Sunday School Records SC 1438;
Stout Family Papers M1280

Digitized surrogates: <https://images.indianahistory.org/digital/collection/p16797coll9>
(Bethel A.M.E. Church Collection - Indiana Historical Society Digital Images,
<https://images.indianahistory.org/digital/collection/p16797coll9>, 2016)

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SPECIAL NOTE

The School of Informatics and Computing (SOIC) in downtown Indianapolis has changed its name to “Luddy School of Informatics, Computing, and Engineering” on January 11th, 2023. For the purposes of the creation of this project, as well as previously published information, all instances of SOIC will remain as is.