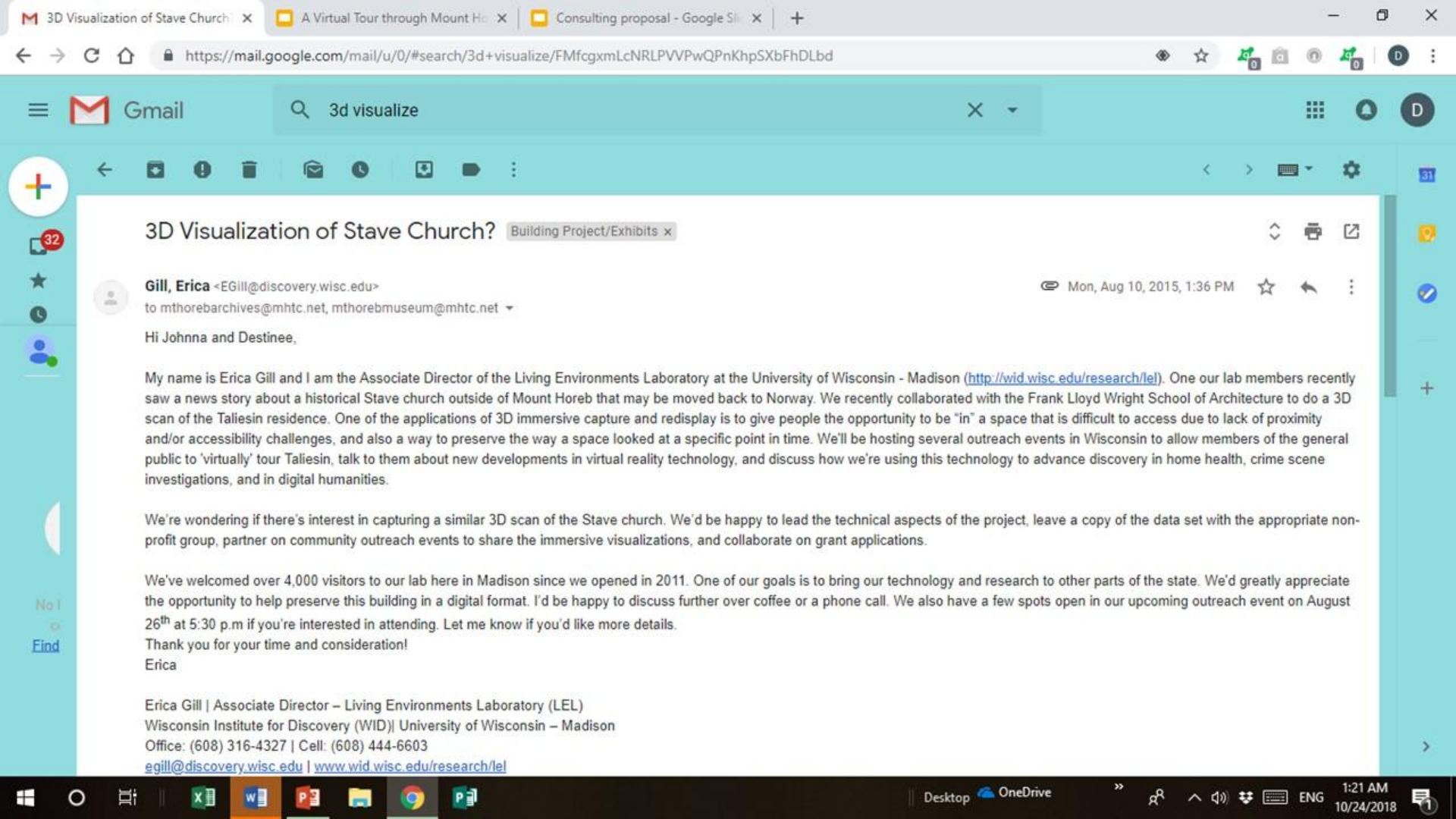


Mount Horeb in 3D: Virtual Reality as a Preservation & Museum Tool



Destinee Udelhoven - Mount Horeb Area Historical Society
Ross Tredinnick - Wisconsin Institute for Discovery

Local History & Historic Preservation Conference
Elkhart Lake, WI 11 October 26, 2018



3D Visualization of Stave Church?

Building Project/Exhibits x

Gill, Erica <EGill@discovery.wisc.edu>

to mthorebarchives@mhtc.net, mthorebmuseum@mhtc.net

Mon, Aug 10, 2015, 1:36 PM

Hi Johnna and Destinee,

My name is Erica Gill and I am the Associate Director of the Living Environments Laboratory at the University of Wisconsin - Madison (<http://wid.wisc.edu/research/lel>). One our lab members recently saw a news story about a historical Stave church outside of Mount Horeb that may be moved back to Norway. We recently collaborated with the Frank Lloyd Wright School of Architecture to do a 3D scan of the Taliesin residence. One of the applications of 3D immersive capture and redisplay is to give people the opportunity to be "in" a space that is difficult to access due to lack of proximity and/or accessibility challenges, and also a way to preserve the way a space looked at a specific point in time. We'll be hosting several outreach events in Wisconsin to allow members of the general public to 'virtually' tour Taliesin, talk to them about new developments in virtual reality technology, and discuss how we're using this technology to advance discovery in home health, crime scene investigations, and in digital humanities.

We're wondering if there's interest in capturing a similar 3D scan of the Stave church. We'd be happy to lead the technical aspects of the project, leave a copy of the data set with the appropriate non-profit group, partner on community outreach events to share the immersive visualizations, and collaborate on grant applications.

We've welcomed over 4,000 visitors to our lab here in Madison since we opened in 2011. One of our goals is to bring our technology and research to other parts of the state. We'd greatly appreciate the opportunity to help preserve this building in a digital format. I'd be happy to discuss further over coffee or a phone call. We also have a few spots open in our upcoming outreach event on August 26th at 5:30 p.m if you're interested in attending. Let me know if you'd like more details.

Thank you for your time and consideration!

Erica

Erica Gill | Associate Director – Living Environments Laboratory (LEL)
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Office: (608) 316-4327 | Cell: (608) 444-6603
egill@discovery.wisc.edu | www.wid.wisc.edu/research/lel

Norway Building from 1893 Chicago World's Fair heads home



A building that was brought to Chicago for the World's Columbian Exposition of 1893 from Norway was moved to Wisconsin as a family destination, then a tourist site. Now, it is being dismantled by the sons of the workers who built it and taken back to Norway.

By Colleen Mastony · Contact Reporter
Chicago Tribune



Norway Building, among of the last structures from 1893 Chicago World's Fair, heads home

SEPTEMBER 19, 2015, 4:14 PM | BLUE MOUNDS, WIS.

Olav Sigurd Kvaale walked up the old wooden stairs of the medieval-style church. He paused under the gabled portico and reached out to touch the intricate, 122-year-

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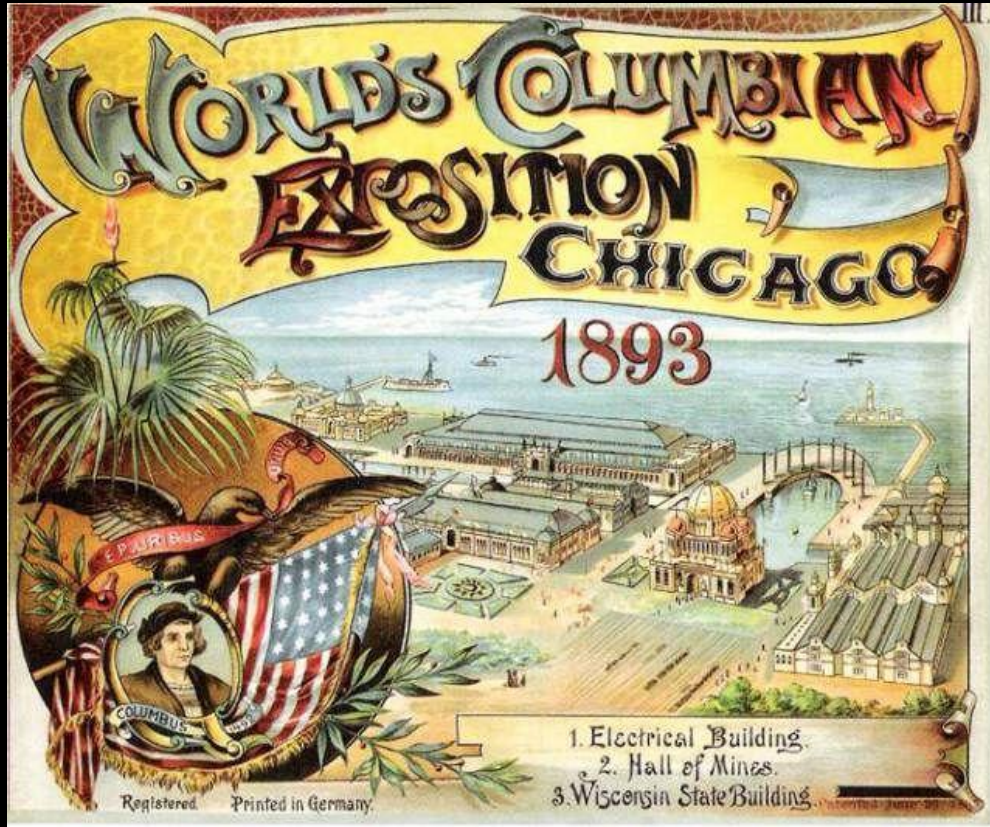
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**The Story
Behind the
Inspiration:
A Brief History
of the Norway
Building**





1892: Norwegian Government decides to enter Columbian Exposition to promote Norway and Norwegian products to the world. A iconic stave church structure is designed and constructed by Trondheim's M. Thams & Co as a prefabricated building kit--for quick assembly and disassembly, and easy relocation.

May-Oct 1893:
World's Columbian
Exposition Residency

On the
fairgrounds of the
World's Columbian
Exposition.

Photo by C.D. Arnold.

Image courtesy
University of Chicago
Photographic Archive,
apf3-00040.



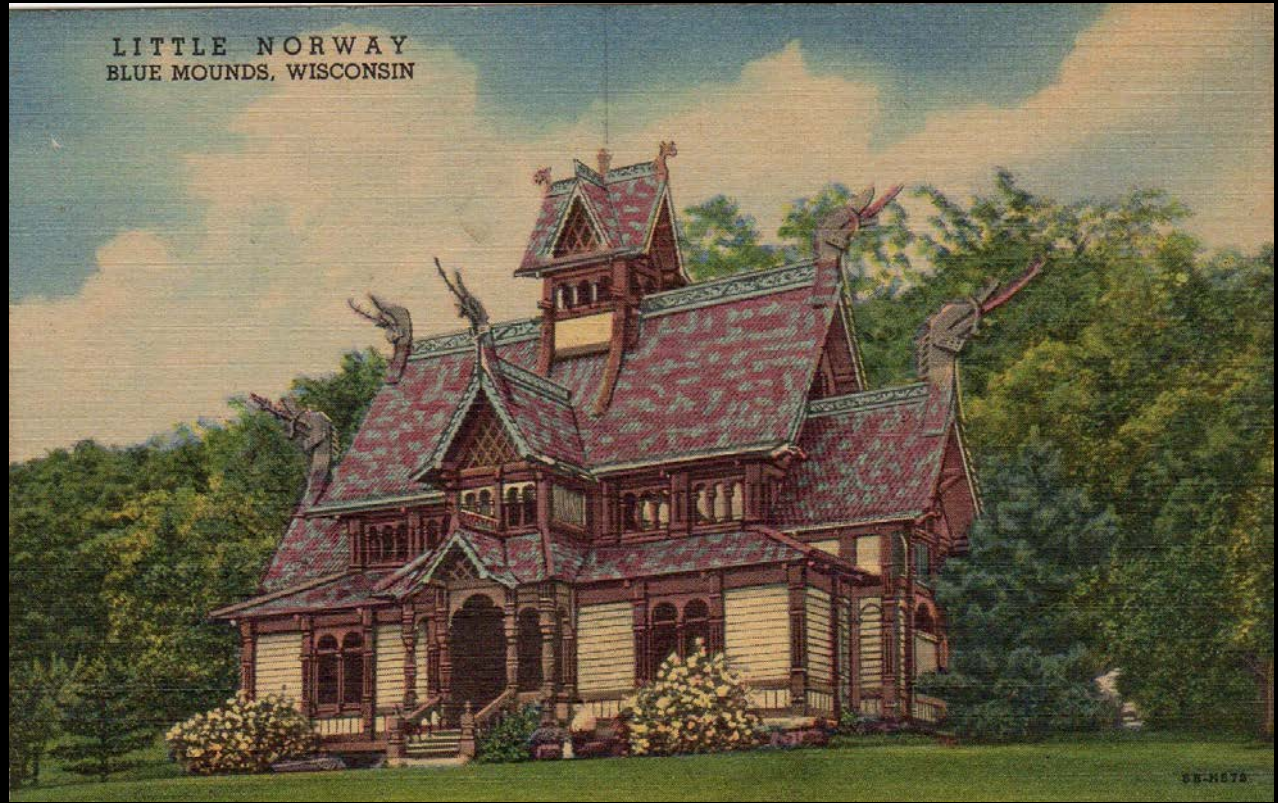
Lake Geneva Residency, 1893-1934



William Wrigley, Jr. , American Industrialist, 1861-1932



Little Norway Residency: 1935-2012



Vintage Little Norway postcard
Image courtesy Mount Horeb Area Historical Society

2012: Little Norway Closes

- Future of site unknown
- 2015: Artifacts and building contents sold at auction
- 2015: MHAHS receives grant to purchase representative site artifacts
- 2018: Little Norway Owner Scott Winner donates organizational archives to MHAHS



Project Heimatt: Norway Building Returns Home to Orkdal, Norway

Sept 2015.

Photo by
Stacy Wescott,
Chicago Tribune.





“If it can’t be here, what a wonderful thing to have it go back to Norway.”

Scott Winner,
Little Norway Owner,
2016.

Photo by John Hart, *State Journal*

September 2017: Orkdal Building Dedication



Photo by
Eva Anita Saethre,
courtesy *madison.com*.



NORWAY BUILDING

THAMSPAVILJONGEN

1893

ORKANGER



The Norway Building /
Thampaviljongen
@thampaviljongen

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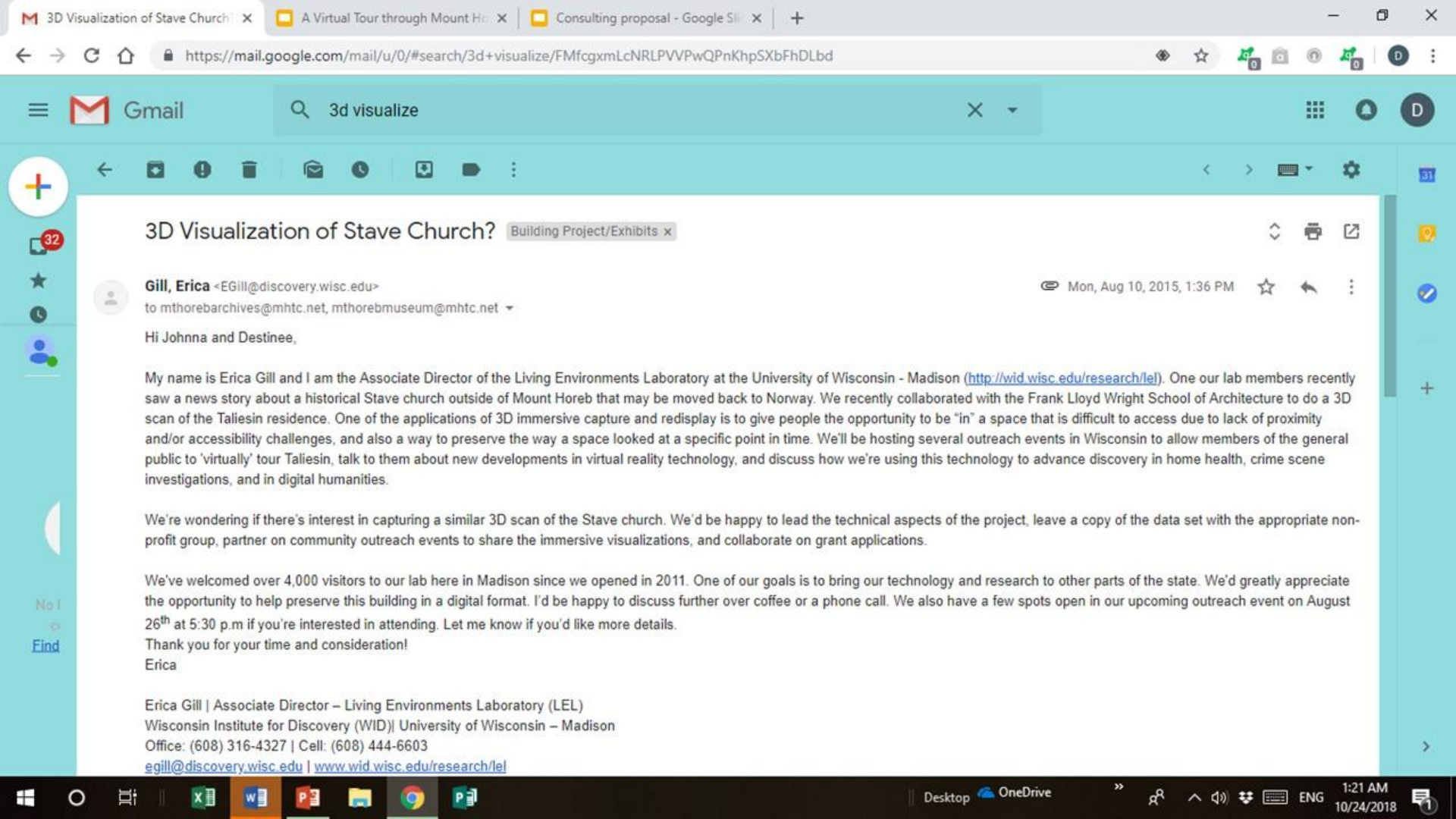
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“Virtual Tour of Mount Horeb Area”

KIOSK UNVEILED
with first scan,
Norway Building,
@ Driftless Historium
Grand Opening
June 3, 2017



Expanding the Project

- March 2017: Raymond & Margaret Vicker Charitable Trust awards \$32,835 grant for “A Virtual Tour through Mount Horeb” project, funding two more site scans, a custom exhibit kiosk and tech equipment
- Choosing two sites
 - Criteria
 - Local history resonance
 - Structural integrity to era of interpretation
 - *Consider site contract for future endeavors?*
- Contract with Local Historian Arlo Paust to craft succinct site histories, edited and approved by site representatives, for voiceover
- Coordinate scan dates and voiceover recordings with Ross and participants
- Contract Master Carpenter Dana Duppler to construct kiosk inspired by porch of Norway Building

SITE 2: Brunsveen Barn, Rare Earth Farm, Green County, WI



- ♦ Built in 1883
- ♦ “Hanging barn” style
 - ♦ Employs metal rods to support weight of expanded width, without use of bulky columns
- ♦ Used as dairy continuously through 1970s
- ♦ Now utilized as art studio by Rare Earth Farm owners and caretakers Charles Bauer and Charles Beckwith
- ♦ History Narrator: Charles Bauer
- ♦ Two levels scanned

Brunsveen Barn Scan Prep/ Cleaning Day

August 2017





Brunsvveen Barn Scanning Session August 2017



Brunsvveen Barn
Voiceover Recording Session
April 2018





SITE 3:

Springdale Lutheran Church, Mount Horeb, WI

- ◊ Classically constructed house of worship
- ◊ Erected in 1895 to serve the Norwegians of Springdale and Blue Mounds
- ◊ Current steeple copy of original designed by prolific Norwegian carpenter Aslak Lie
 - ◊ Original now on display at Driftless Historium
- ◊ History Narrator: Sue Bakken, Church Council President, 4th generation congregational member
- ◊ FOUR levels scanned! [Check out the bell tower!]



Springdale Lutheran Church

Voiceover Recording Session

Sept 2018



**Springdale
Lutheran Church
Scanning Session
April 2018**

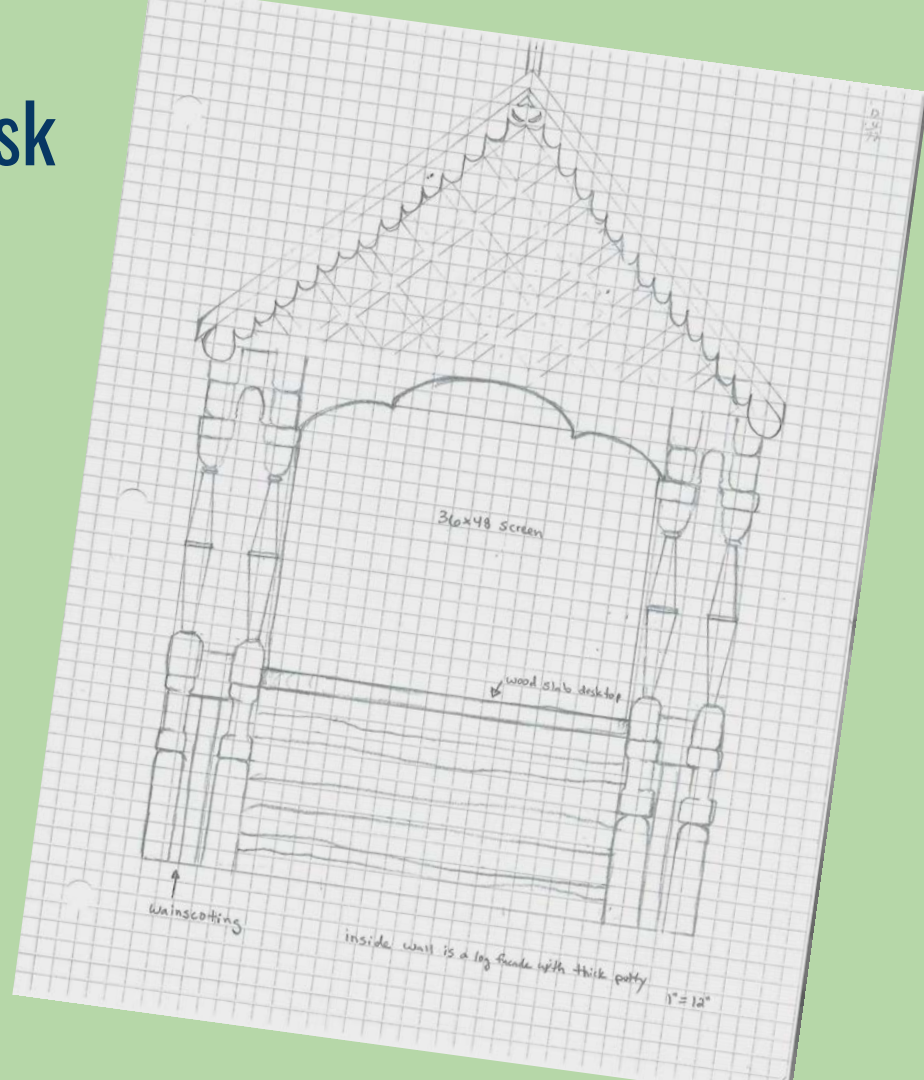


Norway Building-Inspired Kiosk

Design: Arlo Paust

Construction: Dana Duppler

Thank you to Little Norway
Owner Scott Winner for
donating original Norway
Building shingles!









VR as Museum & Preservation Tool

- Preserve endangered or culturally sensitive environments for future study and enjoyment
- Make private or non-accessible sites accessible to public
- Financially feasible, grant- and donor-friendly!
- Add technology interest to small museums and organizations

The possibilities of applying LiDar and VR in the fields of historic preservation and public history are not hypothetical, theoretical or merely speculative. Right now, today, we can preserve the physical data of a cultural site or structure in perpetuity...**The future is here. How can we use it to save the past?**

“Virtual Reality as an Agent of Preservation,”
Forum Journal, 32:1, page 29.

ForumJournal
VOL. 32, NO. 1

Technology Transforming Preservation



National Trust for Historic Preservation
**Preservation
Leadership Forum**

UW - Madison Wisconsin Institute for Discovery

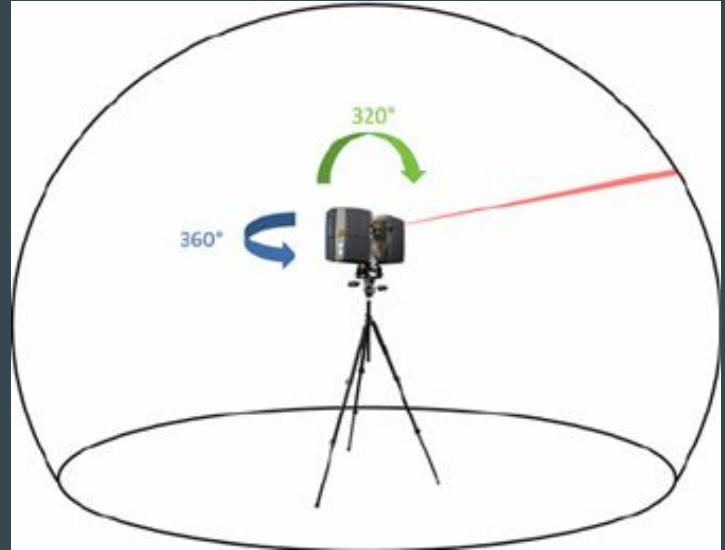


Wisconsin Institute for Discovery Virtual Environments Group

- 2 Faculty
- 3 Staff
- 1 Post Doc
- 3 Graduate Students
- 8-14 Undergraduate Students



LiDAR Scanning



LiDAR Scanning

- In 12 minutes, acquires up to 44 million colored 3D points of the environment surrounding its operation
- Move the scanner through an environment, performing scans to capture the whole space.



LiDAR Scanning

- Resultant data sets = LARGE
 - For example, single 27 GB compressed file
 - 1.7 billion points
- Specialized software that our research group develops to display the models with
 - High Quality
 - High Interactivity

Virtual Reality (VR) Technology

- Shows stereoscopic imagery to each eye
- Tracks position and orientation of head
- Combine with 3D tracked input devices
- Optionally provides spatial audio cues
- Head Mounted Displays (HMDs) block out the real world
- This all adds immersion that can invoke a feeling of “being” in the displayed 3D environment - a sense of “presence”



LiDAR + VR Technology

- Combining these two technologies:
 - Allows users to experience highly realistic representations of actual environments and spaces at a later point in time
 - This affords applications across a range of fields



Applications - Health in the Home



Study and assess physical aspects of a home w/ virtual model

Applications - Crime Scene Investigation



Analyze potential evidence in a crime scene at a later time

Applications - Cultural Heritage / Historic Preservation



Preserve physical spaces no longer here, learn from them later



The Norway Building



Brusveen Barn



Springdale Lutheran Church



How can YOU do this?

- Previous Project Budget: ~\$33,000
- Approximate Budget Breakdown:
 - \$7,000 equipment / supplies / travel
 - \$5,000 scanning
 - \$11,000 salaries / programming (1 undergraduate student, 1 staff)
 - \$4,500 carpenter for physical exhibit
 - \$5,500 to museum, for staff, signage, writing, voice overs
- A desire to preserve some interesting historical locations
 - Seek partnership / owners permission
- Funding Ideas: Grantable, Donations, GoFundMe?

Project Timeline

- 2 Year Project Timeline
- 1st year:
 - Scanning of one location,
 - Initial software development
 - Basic exhibit design and setup.
 - Museum exhibit functional with 1 scanned site ~ 6 months in.
- 2nd year:
 - Scanning of two additional locations
 - Physical exhibit construction for improved surrounds
 - Improvements to software
 - Improvements to signage
 - Final museum exhibit upgrade, with new software, documentation, 2 additional sites

Project Parameters

- LiDAR scanning requires 1 person, 2 in special situations
- Scanning time depends on location, # of rooms, occlusions
 - Norway Building - 4 hours
 - Brusveen Barn - 13-14 hours
 - Springdale Church - 10-12 hours
- Scan post-processing time - 3-4 hours per model
 - Some manual editing time - 1-2 hours
 - The rest - automated via PC

Special Thanks

Raymond and Margaret Vicker Charitable Trust,

Alex Hobson, Trustee

Wisconsin Institute for Discovery

Kevin Ponto, Benny Wyson-Grass, Isaac Ware

Mount Horeb Area Historical Society & Driftless Historium

Scott Winner - Little Norway

Sue Bakken - Springdale Lutheran Church

Chuck Bauer & Chuck Beckwith - Rare Earth Farm

Virtual Reality as a Preservation & Museum Tool

Destinee Udelhoven

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