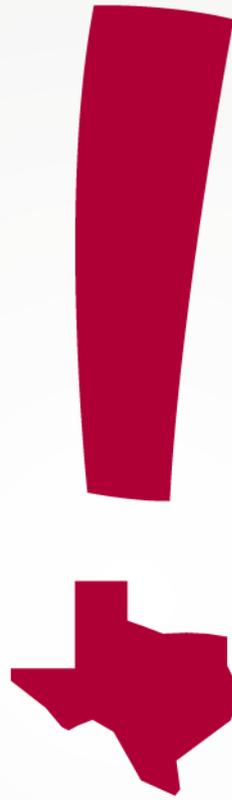


Incorporating AR/VR Technology within Your Museum: A Behind the Scenes Look

Welcome!

The webinar will begin at 11:00 a.m. C.T.



TEXAS HISTORICAL COMMISSION

real places telling real stories



THC Museum Services

- **The Museum Services Program provides support, resources, and training to museums in Texas.**
 - *Consultations*
 - *Webinars and workshops*
 - *Resources*



THC Museum Services

www.thc.texas.gov/museum-services

- On our webpage:
 - *Webinars*
 - *Workshops*
 - *Grants and Fundraising*
 - *Helpful Resources*
 - *Connect and Learn*



THC Museum Services

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Upcoming Free Webinars

- **Insurance Basics for Historical Collections**
 - *Thursday, August 22, 10:00 a.m. CT*
- **Managing Museum Staff from the Back of the Pack**
 - *Thursday, September 5, 2:00 p.m. CT*
- **Environmental Monitoring for Museums: The Basics**
 - *Thursday, September 19, 10:00 a.m. CT*



Incorporating AR/VR within your Museum:

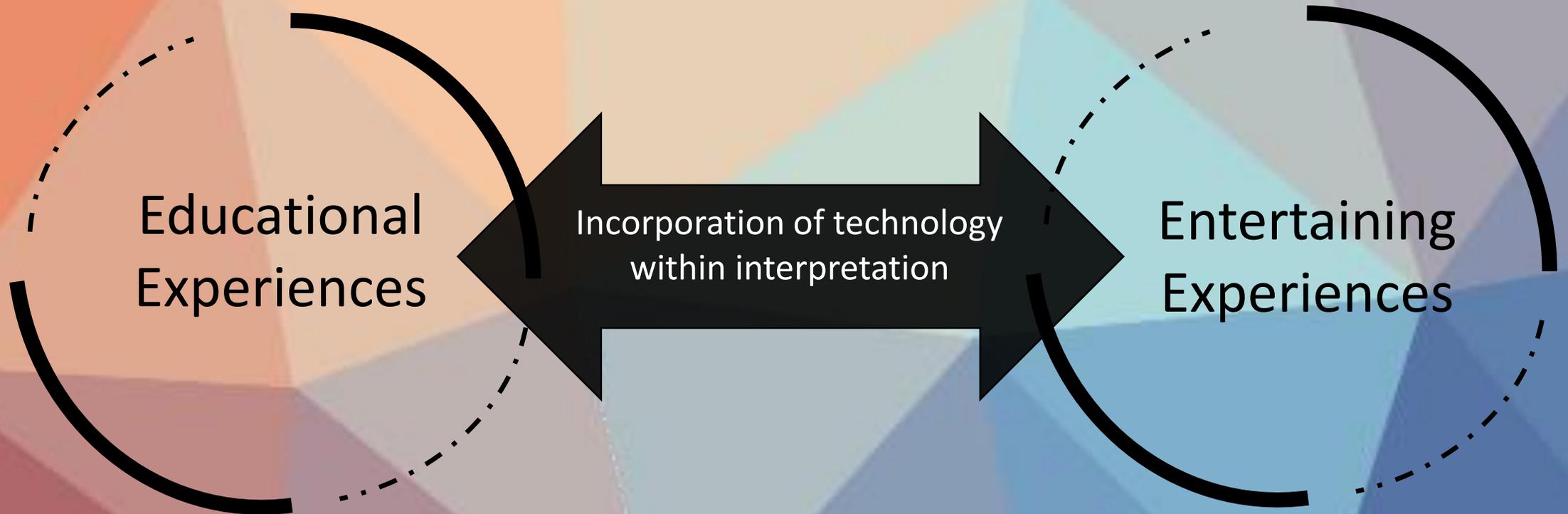
A Behind the Scenes Look

Dani Marshall

Museum of Texas Tech University

Why Museums should incorporate technology

- Museums should make efforts to evolve with society



Common forms of technology museums utilize:

- Interactive Kiosks & Multi-touch Surfaces
- Interactive Projections
- Mobile Applications
- Virtual Reality
- Augmented Reality



Main hinderances of technology incorporation

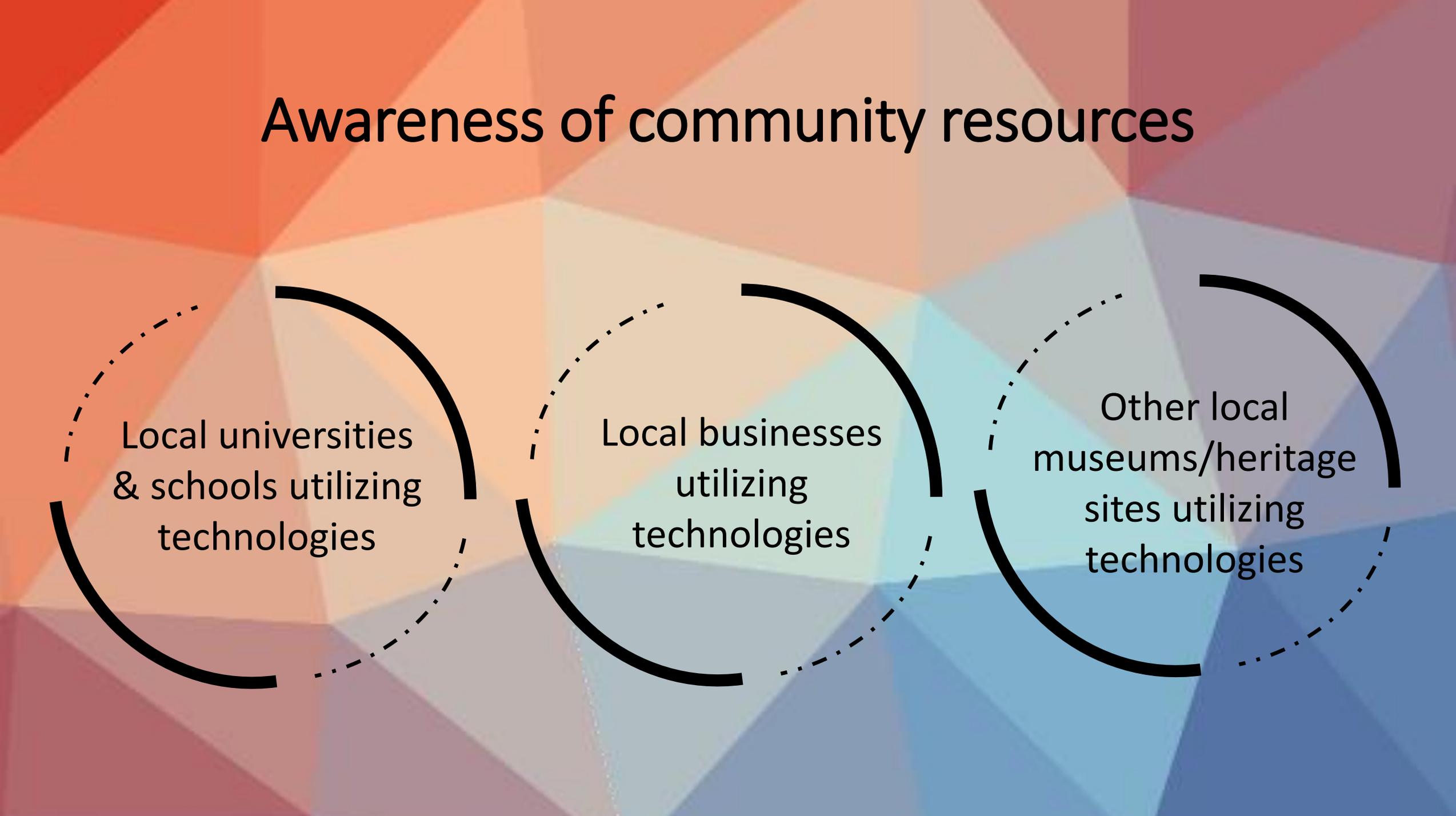
MONEY TO SPEND ON EQUIPMENT

- Smaller, less-funded museums & heritage sites have less financial resources. (2)

UNDERSTANDING OF TECHNOLOGY

- Smaller, less-funded museums & heritage sites have less staff with experience of emerging technologies.

Awareness of community resources



Local universities
& schools utilizing
technologies

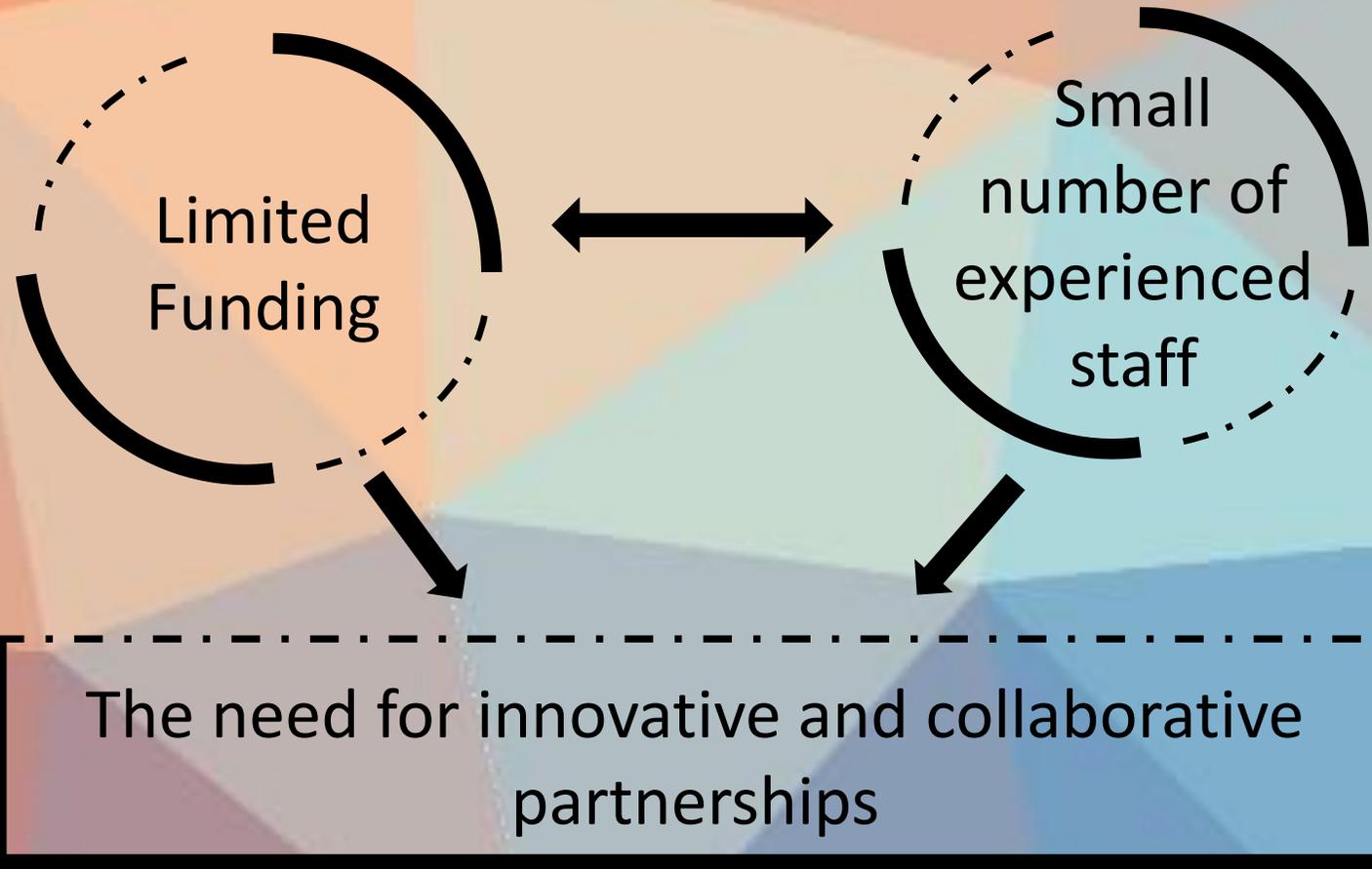
Local businesses
utilizing
technologies

Other local
museums/heritage
sites utilizing
technologies

The Museum of Texas Tech University: A case study



For MoTTU's Technology Incorporation:



In searching for partnerships:

Keep in mind your specific institution.

- Constantly ask questions such as:
 - How can we offer a quid-pro-quo relationship?
 - What does our institution have to offer in a partnership?
 - What type of partnership are we looking for?
 - What types of partnerships do other institutions incorporating technology have and with who are they partnering with?

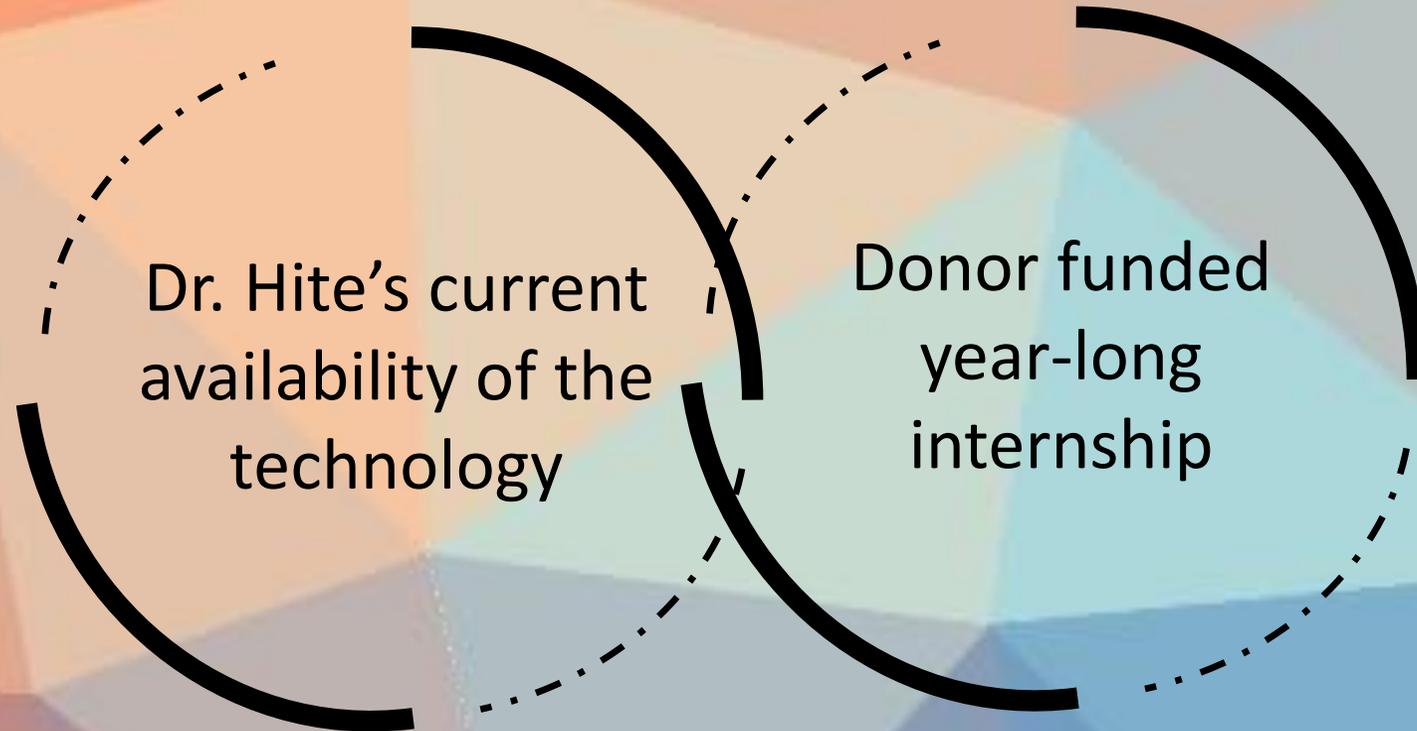
In searching for technologies to use:

Keep in mind your specific institution.



- Constantly ask questions such as:
 - Will this technology be feasible in maintaining long term? (i.e.):
 - Will this technology aid in our interpretation goals?
 - Can we utilize grant writing and/or network of donors for funding?
 - What are the projected costs for repairs/replacements for this technology?
 - Are there costs for any type of licensing?
 - How do we ensure the security of the technology within gallery spaces?

MoTTU's collaborative partners:

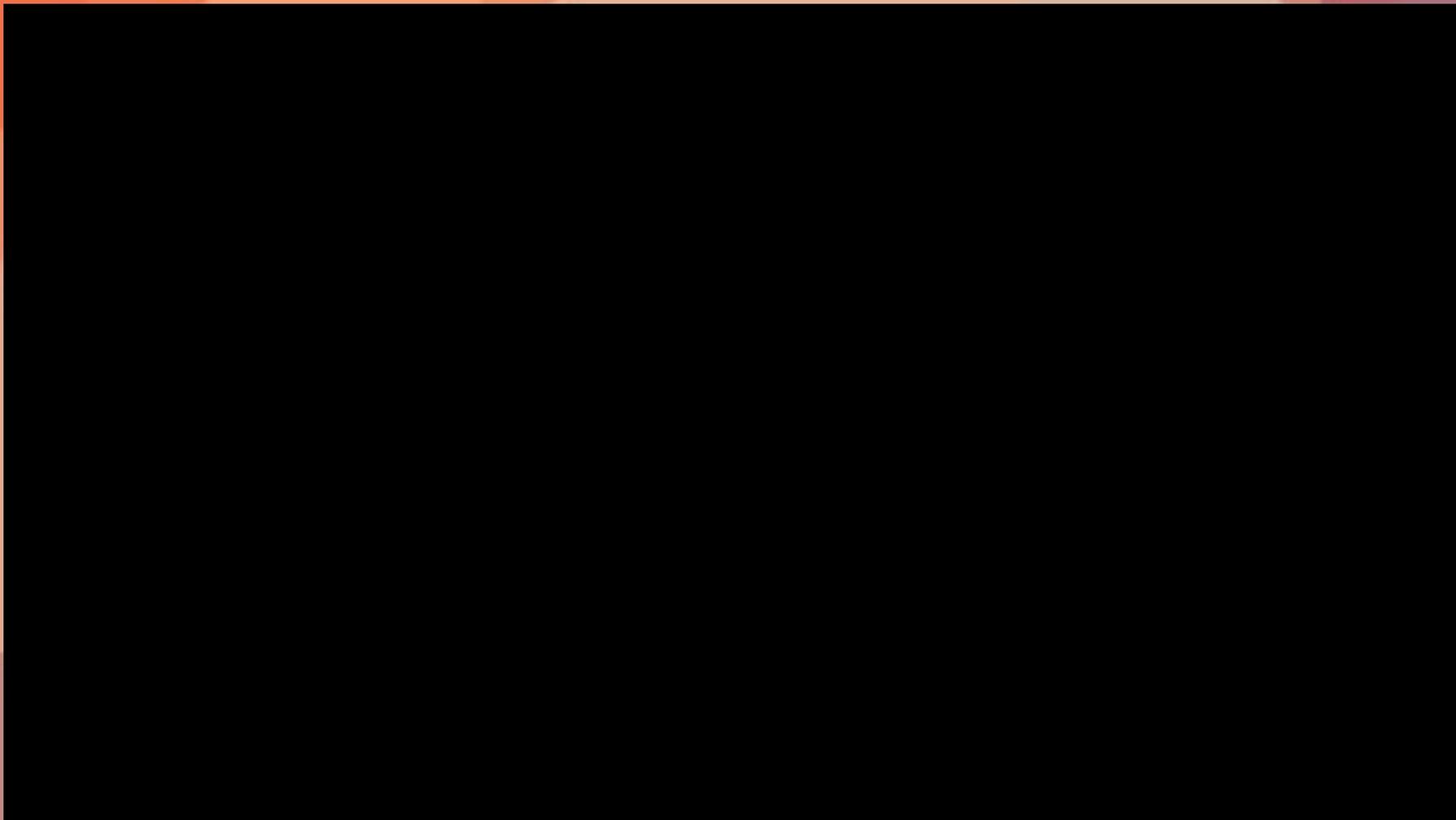


technology ✓

funding ✓

manpower ✓

What is zSpace?



The 'Z' of zSpace

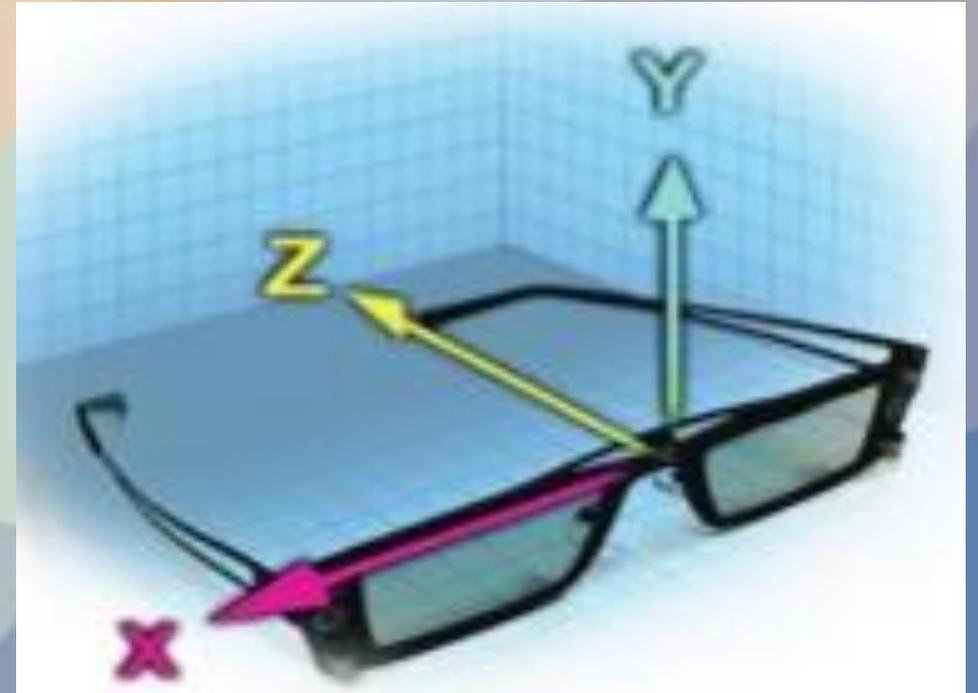
The 'Z' refers to the axis in which the objects are projected from the screen, allowing for the perception that the objects are 'floating' in front of you.



Tracking Sensors



zSpace has tracking sensors on both sides of the system, that pick up on sensors that are on the glasses



This provides a sense of both depth and allows the objects to move based on the movement of the head.

How could this technology enhance MoTTU's guest experience?

- zSpace has the potential to add interactive, educational, and entertaining elements to current and future exhibits.
- However none of the currently pre-designed/pre-programmed activities focus on MoTTU's art, history, or culture based exhibits.

zSpace does allow for customizable activities.

This means we can design our own digital educational activities that highlight our current and future exhibit and collection themes.

Goal of zSpace incorporation

- To make zSpace work for MoTTU's specific needs, customized activities must be created.
- All possible elements of customization should include original MoTTU materials.
- Options that can be customized in zSpace include:
 - *3D Models*
 - *Activity Guide questions*
 - *Layout of activity*
 - *Background photos*
 - *Sounds*



Steps of zSpace incorporation

- Make 3D models of collections objects not currently on exhibit from one of our largest collections of Native American artwork of the southwestern region.
- Use these models to create customized activities within zSpace, in which visitors can have an interactive 3D experience with the objects.



HOW?

My background in AR/VR applications

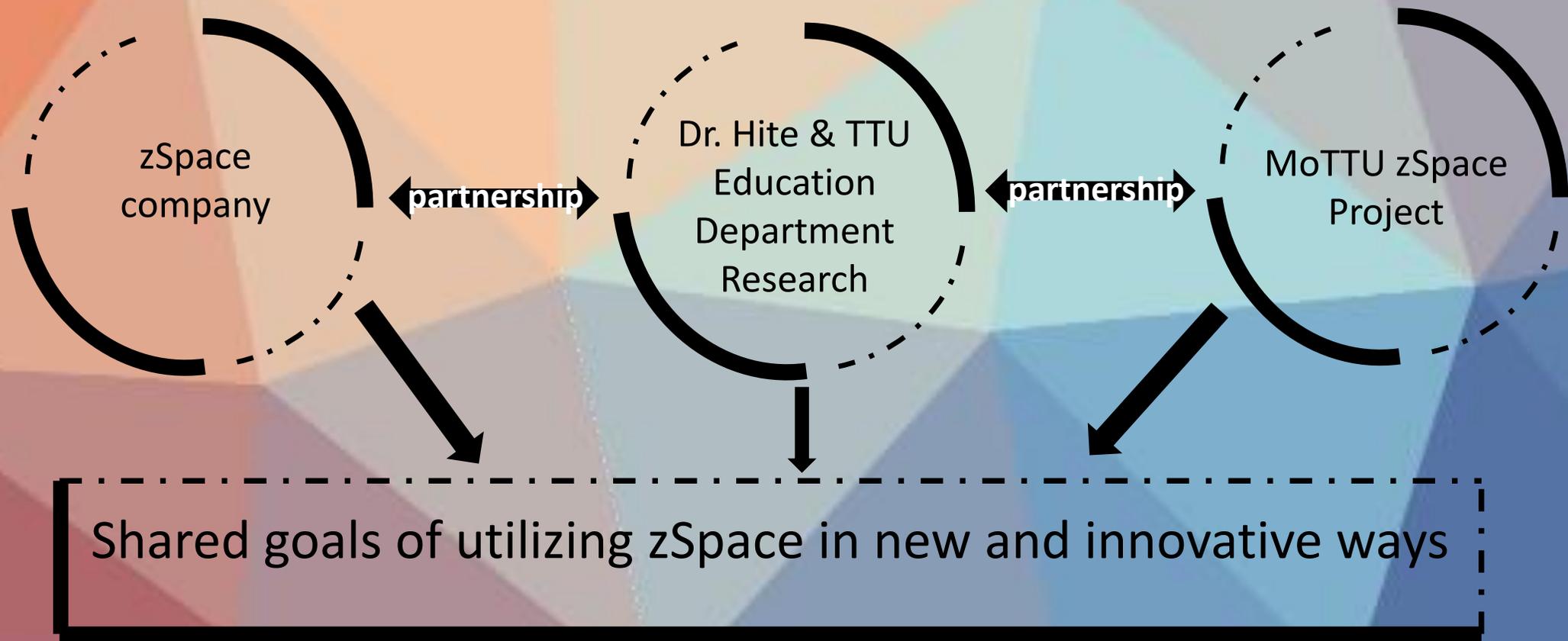
What 'background'?

Only used zSpace's
pre-loaded
activities

Had only made 1
3D model
previously

Supportive partnerships for solutions

- I needed an easier/faster/more user-friendly modeling technique.
--Again, this is where partnerships came into play.



The Process: Laser Scanning

- The first step of the process involved understanding the scanner itself, called a Structure Sensor.

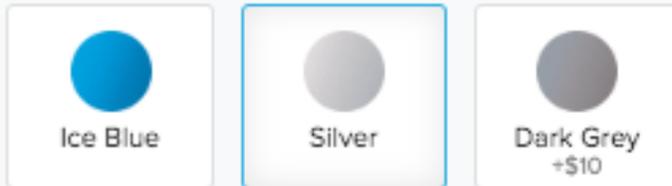


The Process: Structure Sensor

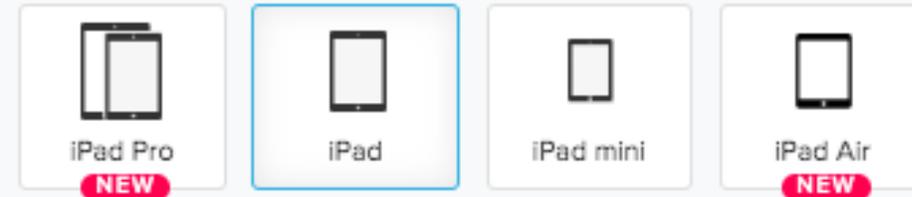


Structure Sensor: Pricing

1. Choose a color:



2. Which iPad do you have? Not sure?



Looking for the [iPad mini \(5th gen\)?](#)

Buy Structure Sensor for iPad – \$399

Includes

- Structure Sensor (with Lightning Cable and Power Adapter)
- iPad Bracket

Buy Complete Bundle – \$519

Includes

- Structure Sensor (with Lightning Cable and Power Adapter)
- iPad Bracket
- USB Hacker Cable
- License for [Skanect Pro](#)
- FREE shipping in the USA

The Process: Laser Scanning Software

itSeez3D software was chosen for the scanning process based on criteria that included:

- *Most recommended software by zSpace*
- *Ease of scanning process*
- *Ease of model export*
- *Low model rendering time*
- *.Obj export file format that is preferred by zSpace software*



itSeez3D: Pricing

50% off for educational projects

Individual

Best way for anyone to get started with 3D scanning

\$0/mo

- ✓ Unlimited scanning
- × Free models exports per month
- × Pre-printing tool
- × Priority support
- × Priority model processing
- × Custom splash screen
- × Partners network
- + \$7 per model export

Professional

Best set for individual 3D artists

\$12/mo

billed annually or \$15 monthly

- ✓ Unlimited scanning
- ✓ 3 models exports per month
- ✓ Pre-printing tool
- ✓ Priority support
- ✓ Priority model processing
- × Custom splash screen
- × Partners network
- + \$6 per extra model export

Business

Advanced set for 3D scanning studios

\$80/mo

billed annually or \$100 monthly

- ✓ Unlimited scanning
- ✓ 30 models exports per month
- ✓ Pre-printing tool
- ✓ Priority support
- ✓ Priority model processing
- ✓ Custom splash screen
- ✓ Partners network
- + \$5 per extra model export

Scale Up

For growing 3D scanning businesses

\$250/mo

billed annually or \$300 monthly

- ✓ Unlimited scanning
- ✓ 100 models exports/mo or 1200/year with no export per month limit
- ✓ Pre-printing tool
- ✓ Priority support
- ✓ Priority model processing
- ✓ Custom splash screen
- ✓ Partners network
- + \$4 per extra model export

Enterprise

Custom set for 3D businesses and enterprises

[Contact us](#)

Reach us if you'd like to have more model exports monthly, faster processing, more collaborators, some special features, etc.

itSeez3D: How it works

1/

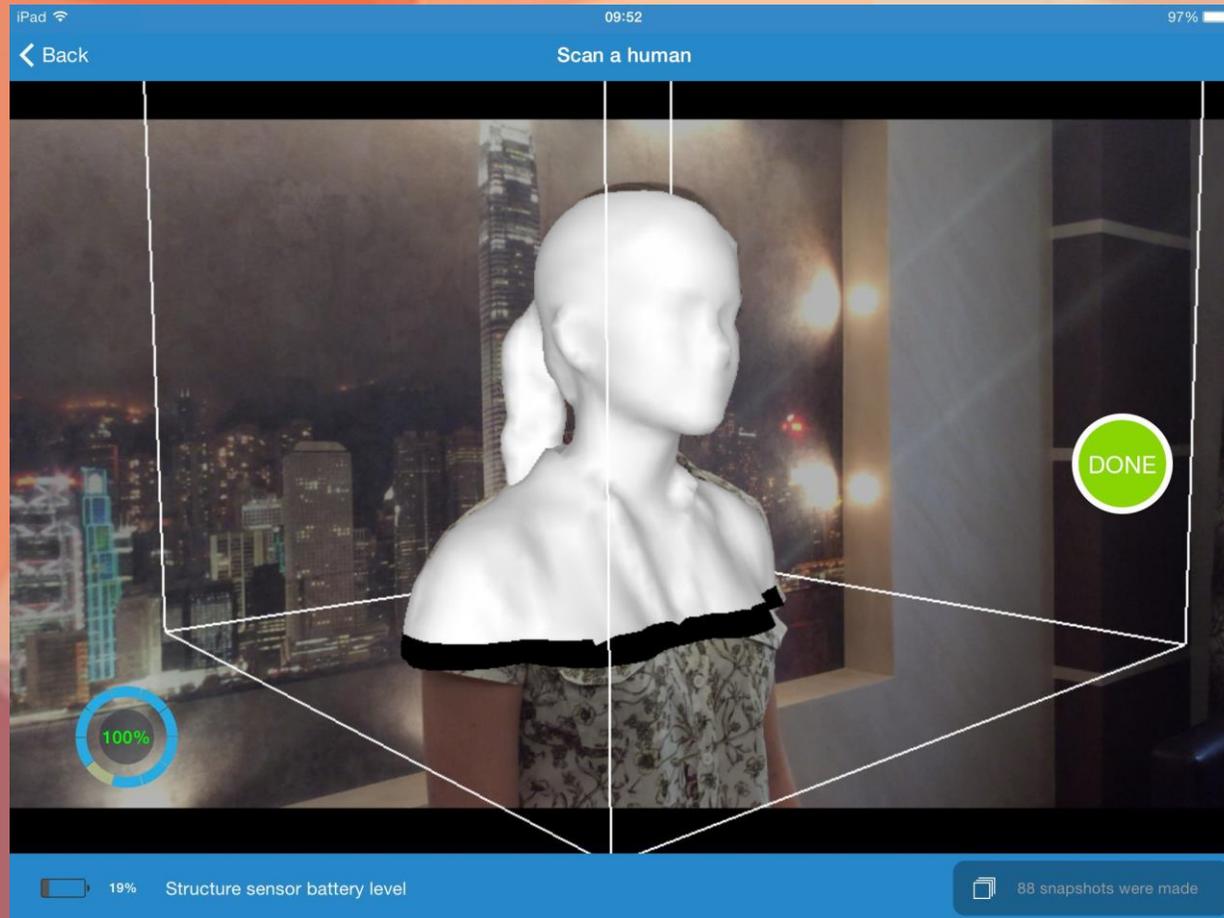
Scan

Scan a person or an object by walking around it with your mobile device and following the instructions in the app.



Only objects that were seen within the bounding box would be captured within the 3D scan

itSeez3D: How it works



Layout of the Process:



- A podium was set up in the center of the room to allow for space to walk 360 degrees around an object



- I marked the location of the podium and the direction of the lights that worked the best for replication each week

The Process: Rendering the scan

Local preview

~ 0.5-1 min, low quality
Uses local resources, you can't use your tablet till it's done

Cloud processing

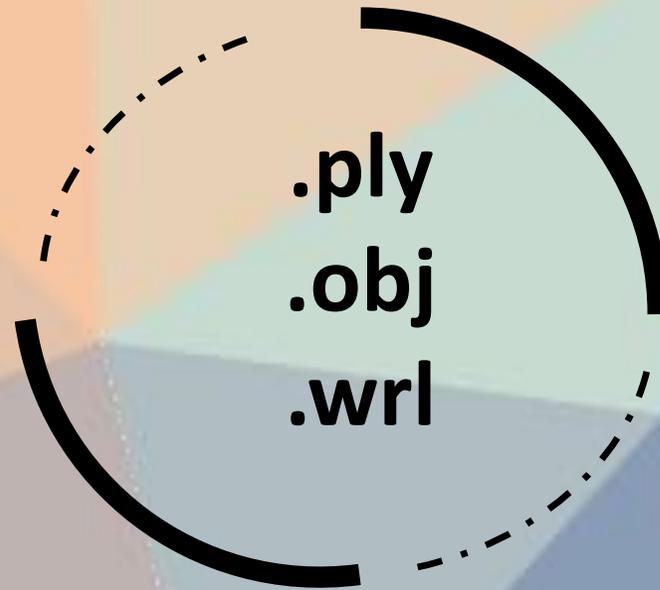
~ 5-15 min, high quality
Uses our cloud's resources, you can use the tablet while waiting

 Edit model's info

- These rendering times were very dependent on the strength of the wifi connection.
- On days with poor connection in the museum, these rendering times were less predictable.
- While rendering a 'high-quality' model, you are still able to use the scanner to continue to make more.

The Process: Exporting the 3D model

With a simple click of a button you are able to download the model via email in file formats:



These models can be used in other editing software, 3D printed, and used in AR/VR.

The Process: In real time



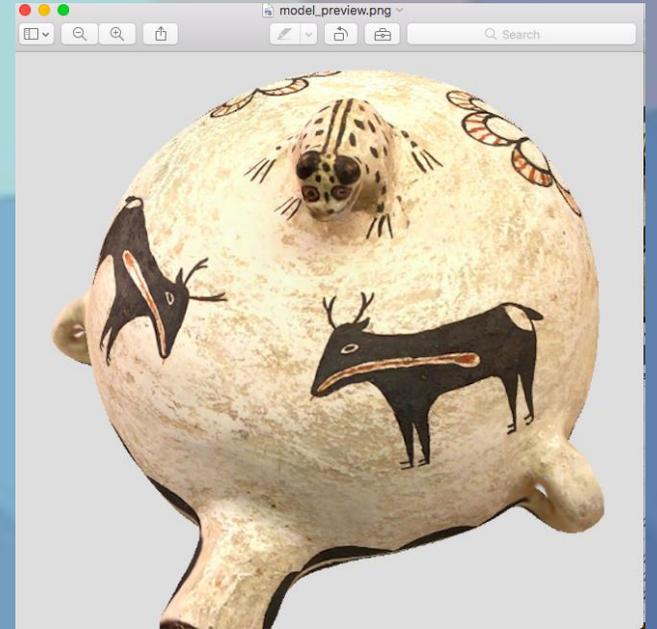
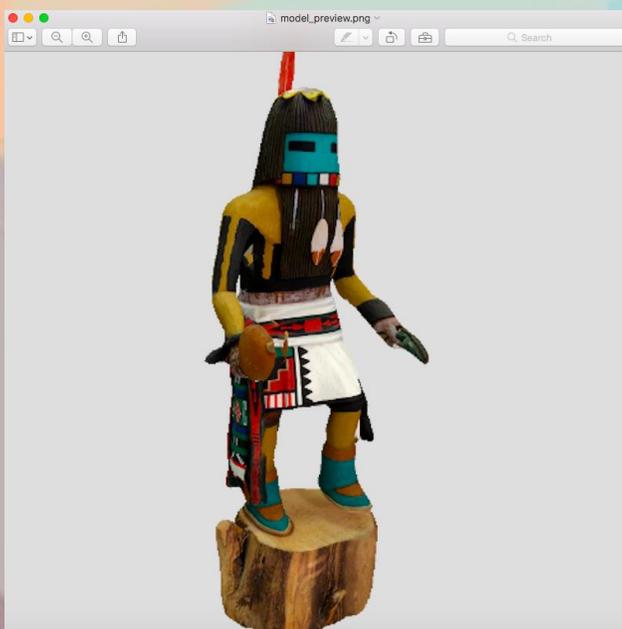
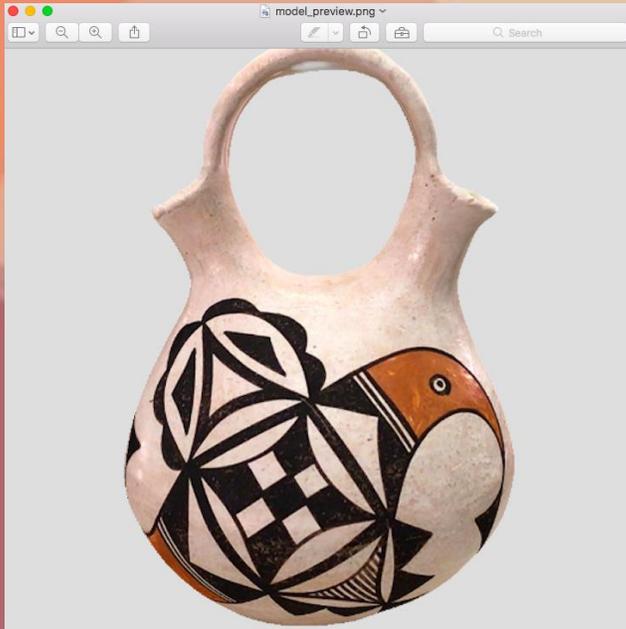
itSeez3D: Pros of the Software

- Ability to learn process very quickly
- Short amount of time it takes to scan an object
- Short amount of time it takes to render the model
- Ability to scan while other models are rendering

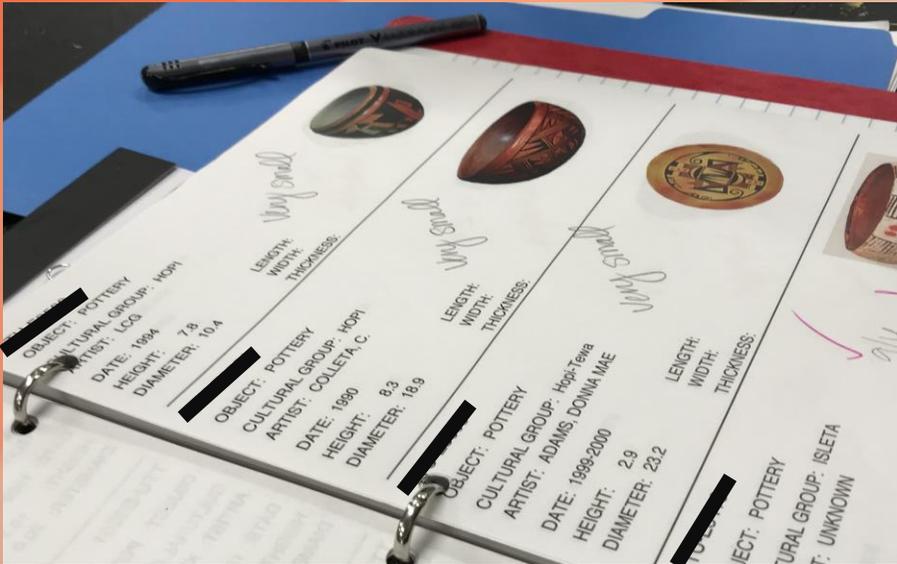


itSeez3D: Pros of the software

- Ability to see in real time how much of the object is scanned
- Ability to omit unwanted scanning of the background
- Creation of realistic true to size models



itSeez3D: Cons of the software



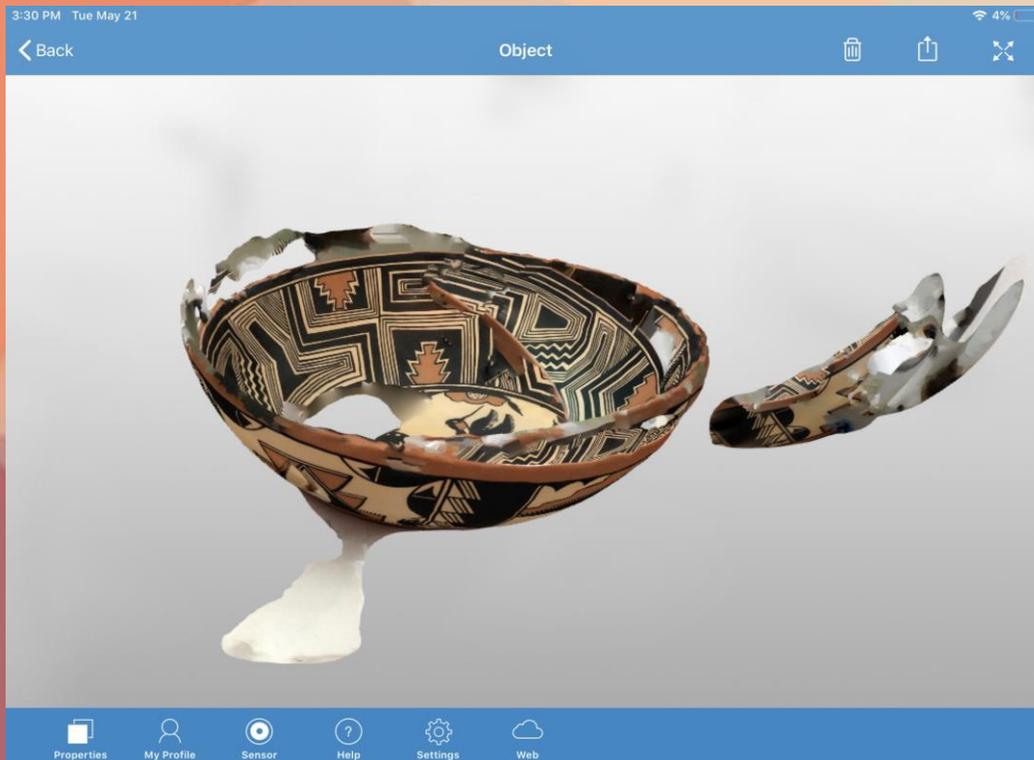
- Height was also a factor in the user
- To scan the top of the object, I often had to blindly lift up the iPad and scan
- Often unsure if I had captured the scan from that angle

- itSeez3D has preferred height requirements between 4-20 inches
- This element made creating scans of objects outside these parameters very difficult



itSeez3D: Cons of the software

- The software had a difficult time scanning and rendering objects that had any type of reflective surface.

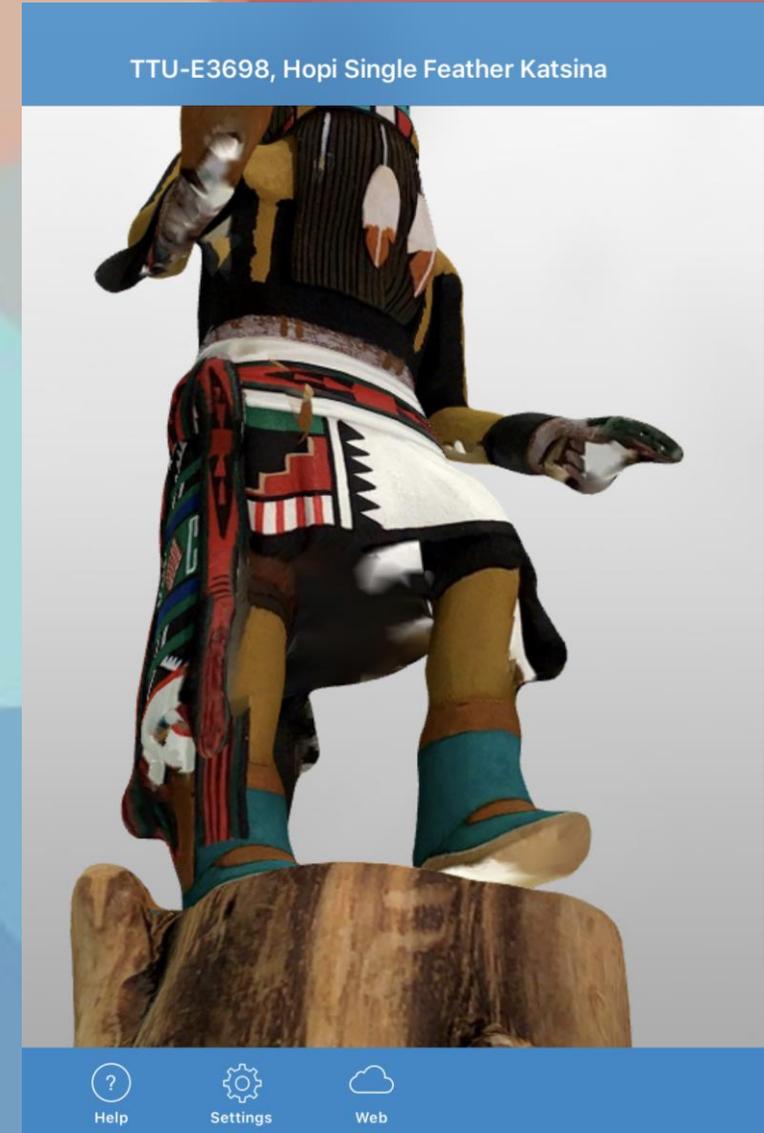


- The software was also rarely able to translate scans of the objects that had patterns on both the exterior and interior.

itSeez3D: Cons of the software

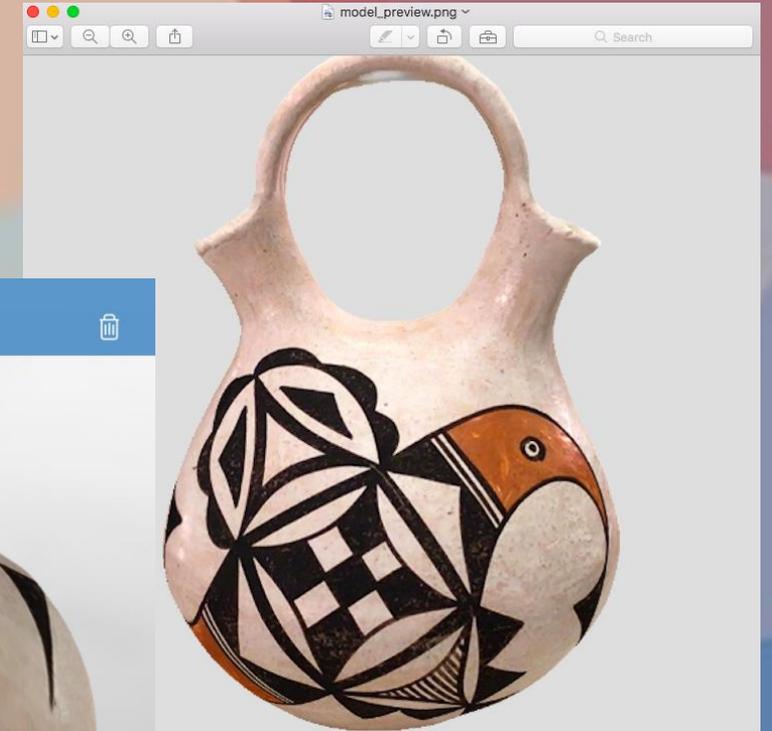
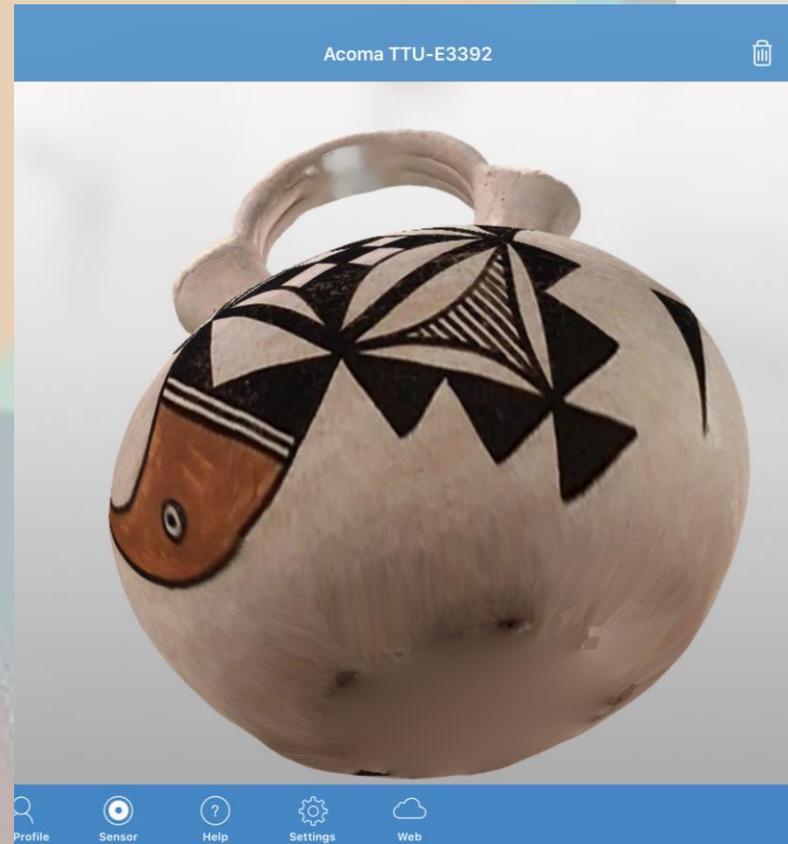


- Since itSeez3D uses a flat surface to orientate the object, you could not move the iPad at a lower angle to capture specific angled scans
- This left white patches of un-scanned texture, and meant I needed to devise a method of editing



itSeez3D: Cons of the software

- itSeez3D makes one continuous scan of an object on a flat surface; this means that the bottoms of objects were not captured but rather color-match generated.



Model Edits

- **Editing software trials**

- *Maya Autodesk 360*
- *Leopoly*
- *MeshMixer*
- *Blender*
- *Tinkercad*
- *Sketchup*



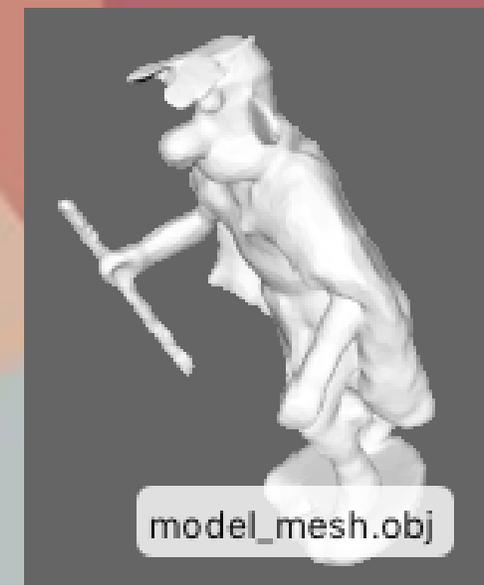
- **Complicated software for such a small fix**



Model Edits: A simple solution

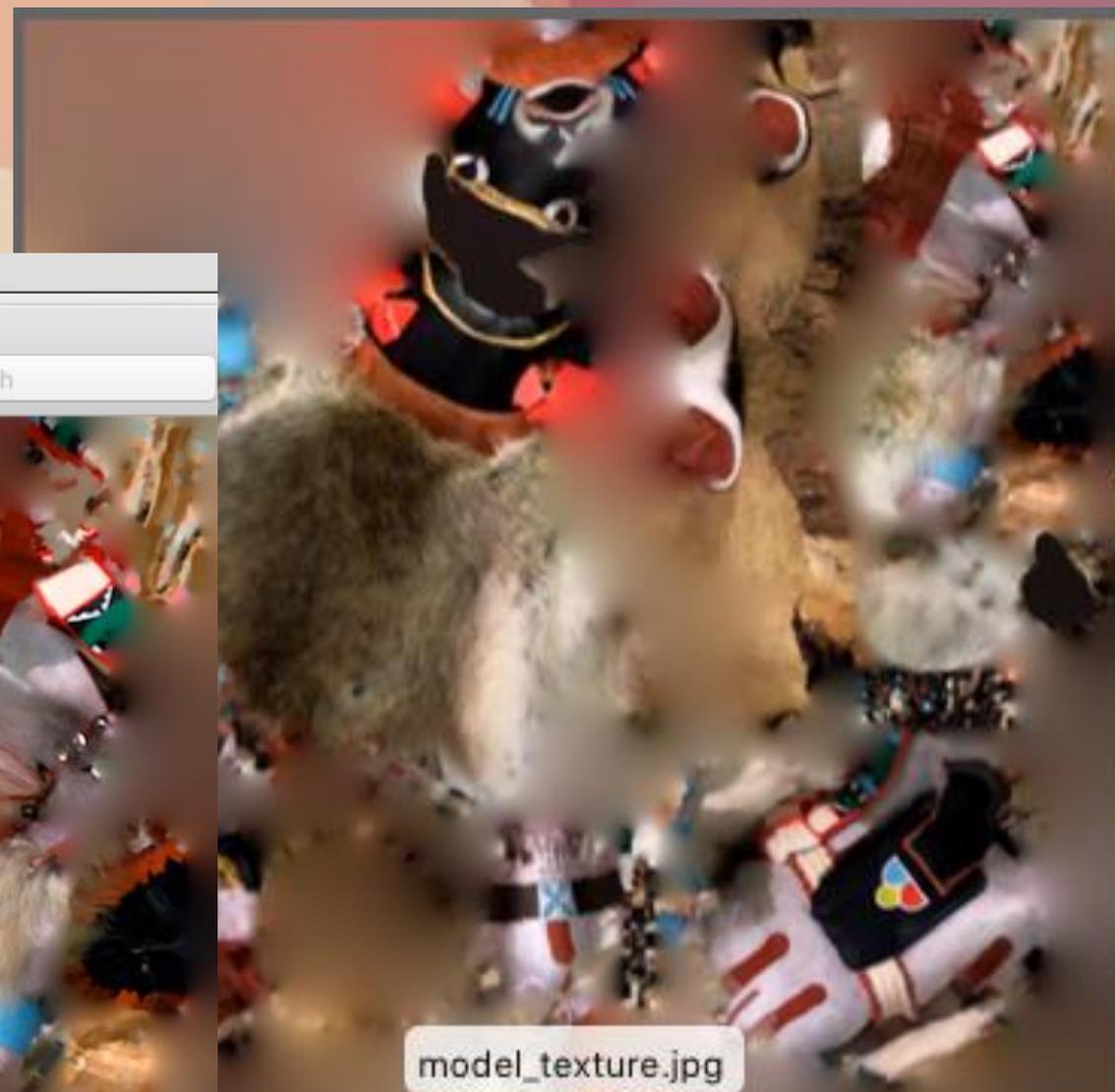
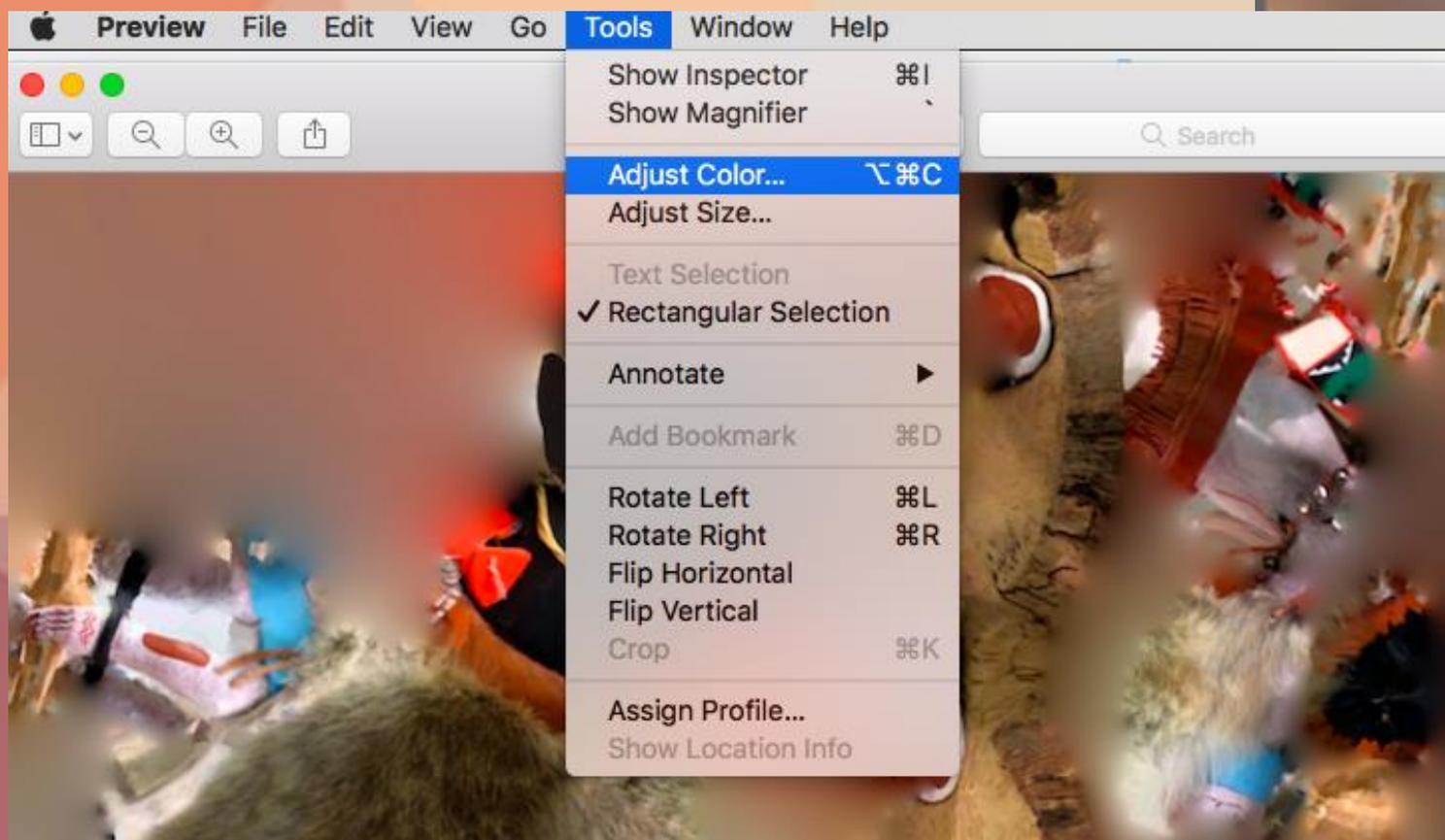
When you open a model's file you see:

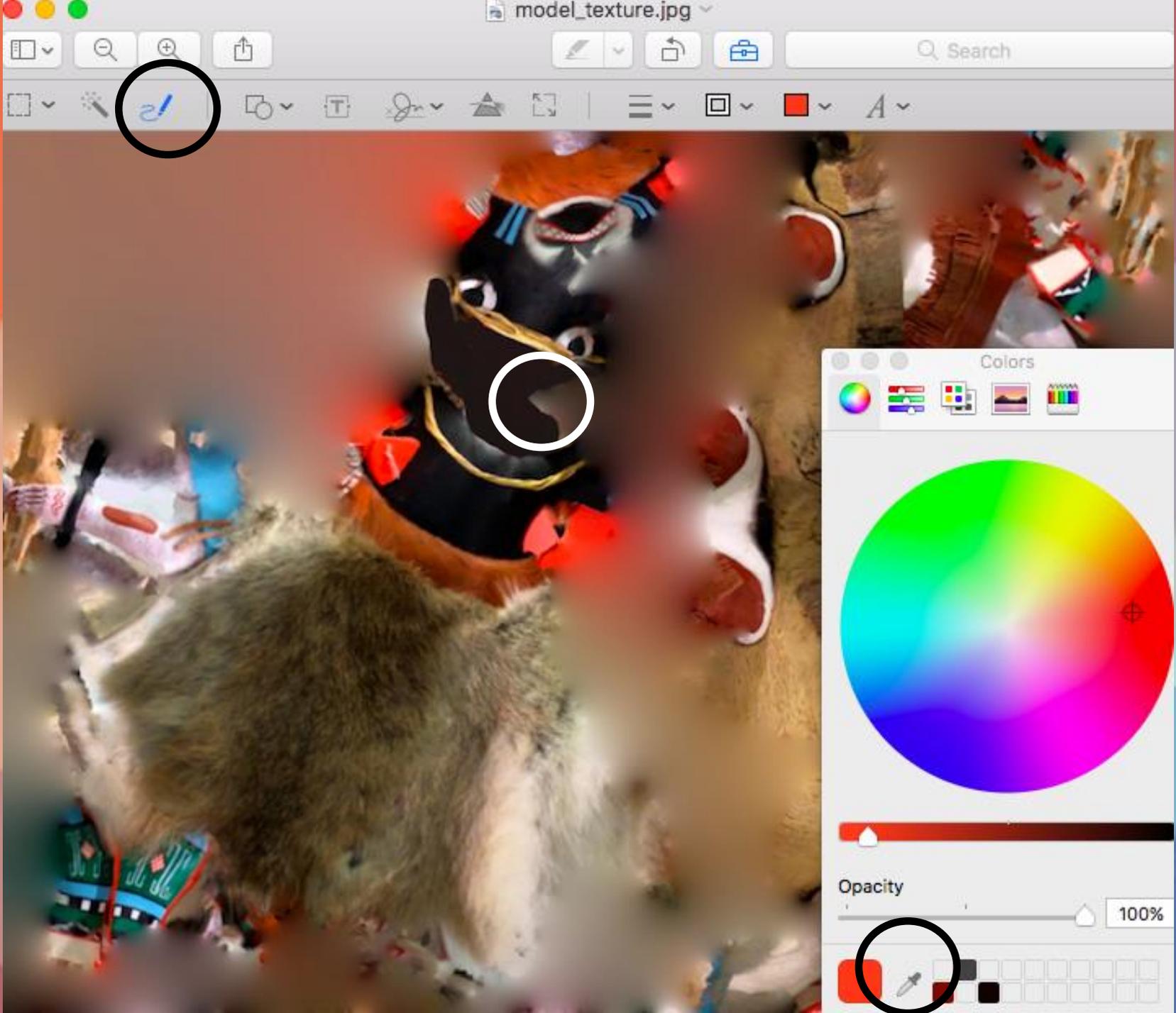
- The model's mesh
- A full preview of model
- The model's texture



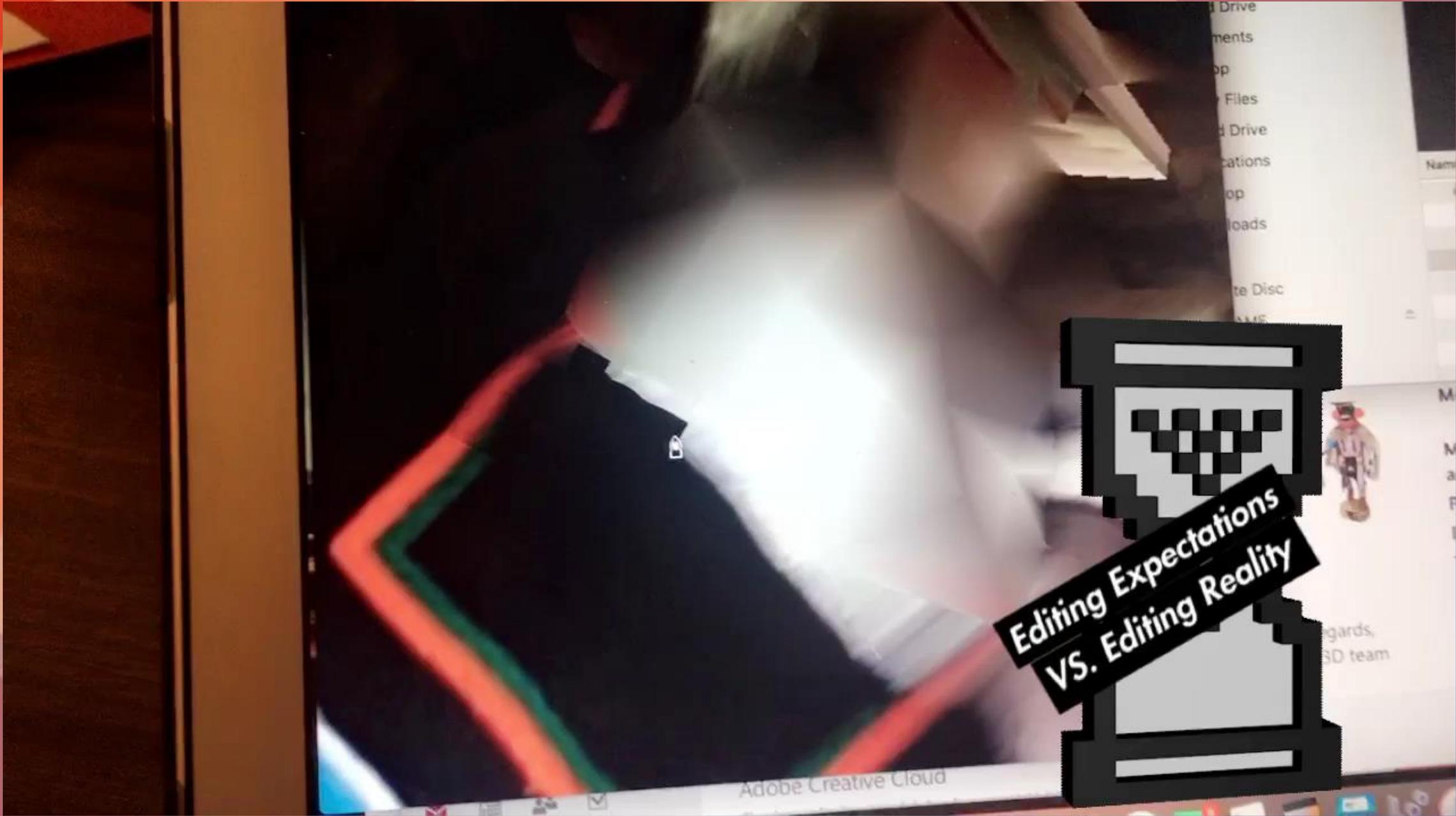
Model Edits: A simple solution

The model's texture is formatted in a .jpg, and you can make edits directly to a .jpg.





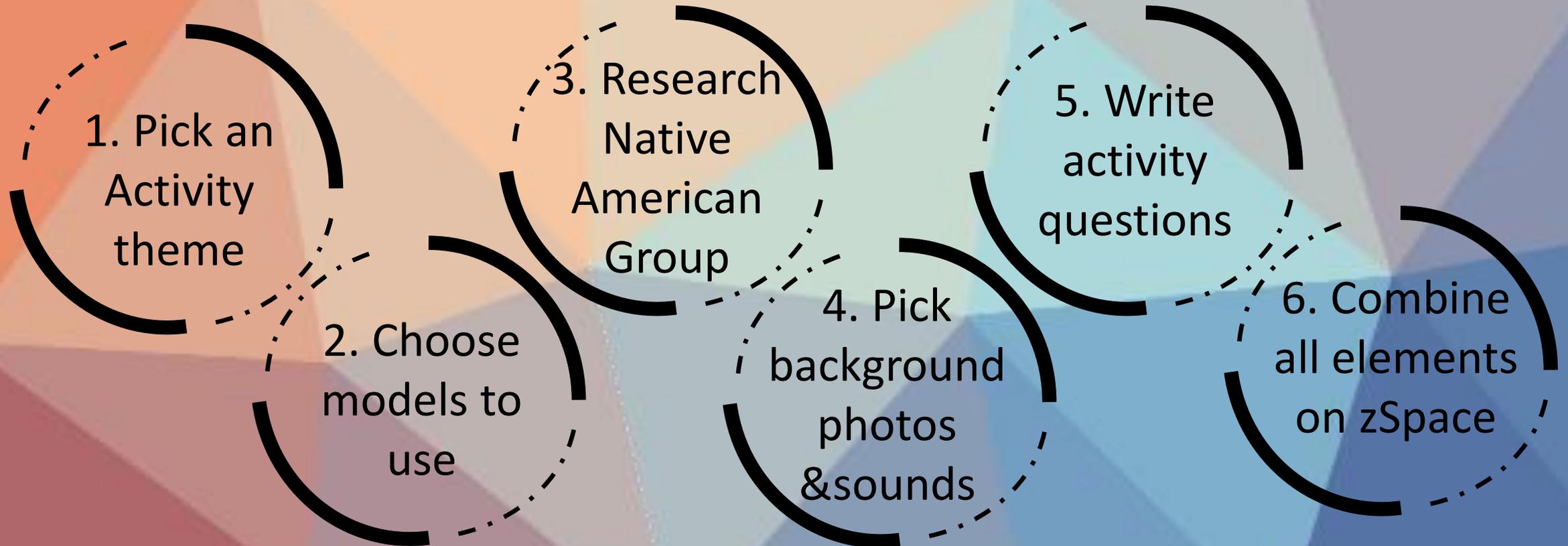


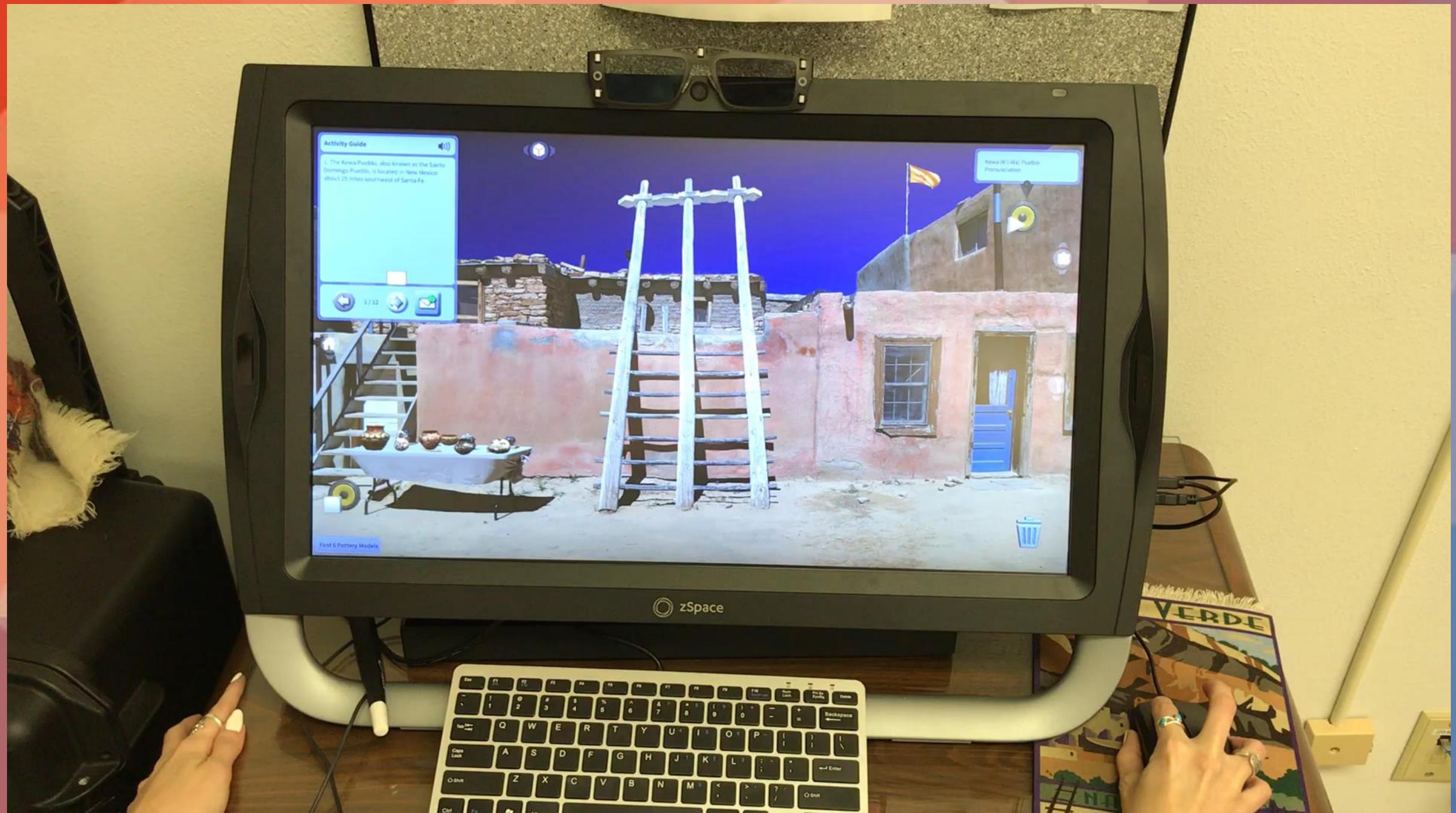


**Editing Expectations
VS. Editing Reality**

Creating Activities: Steps of the process

- Now that I knew I could edit some of the imperfections, it was time to focus on making the activities within zSpace.





Activity Guide

1. The Kewa Pueblo, also known as the Santo Domingo Pueblo, is located in New Mexico about 25 miles southwest of Santa Fe.

Kewa (K) Pueblo
Pueblo
Pueblo

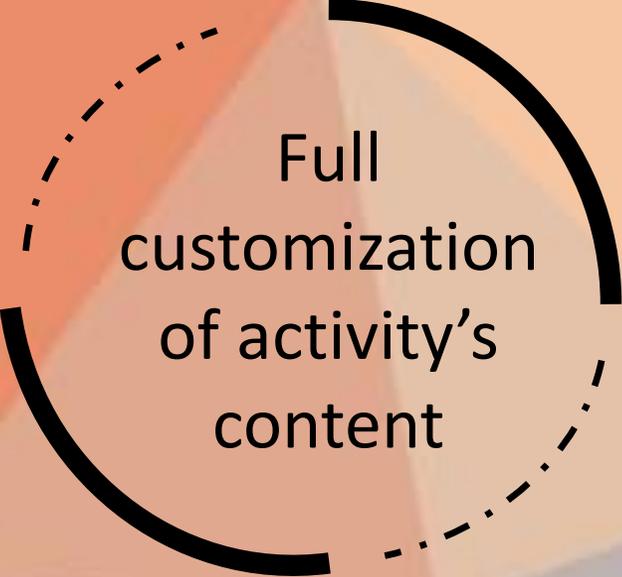
zSpace

First 6 Pottery Models

VERDE

New collaboration with zSpace

- Unique elements of this project that highly interested zSpace:



Full
customization
of activity's
content



New
incorporation of
zSpace within
museum realm



Subject matter
of the activities
in topics of
culture &
history

New collaboration with zSpace

zSpace representatives flew out to visit MoTTU and experience the project first-hand



We hosted a collaborative session with topics that included:

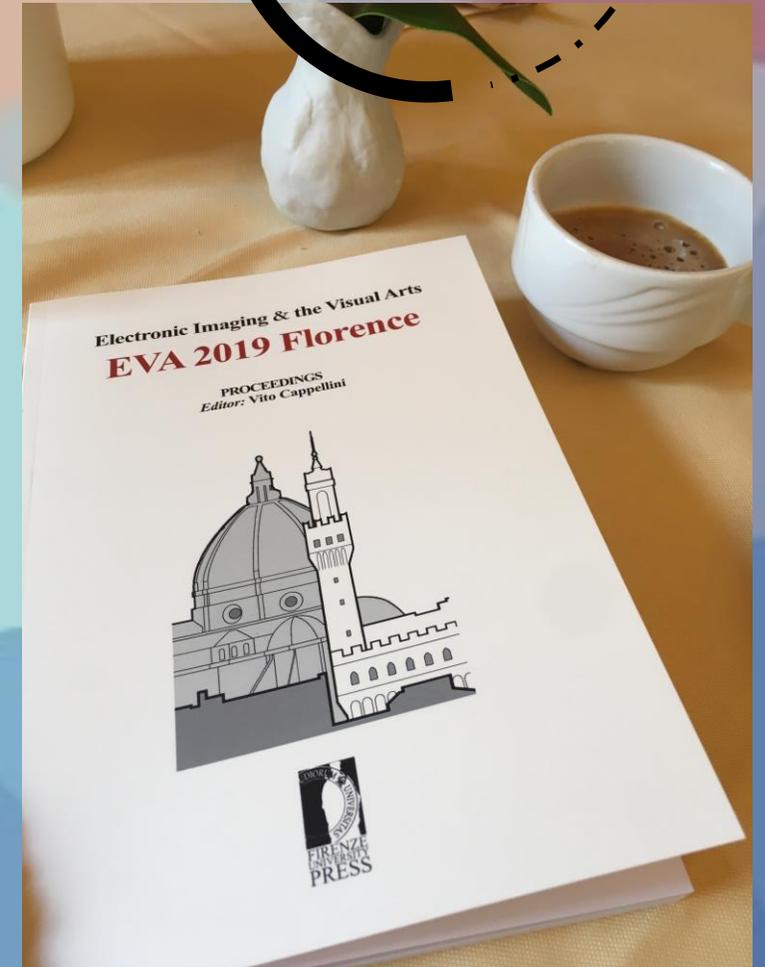
- zSpace representatives knowledge of emerging AR/VR
- The MoTTU zSpace project
- The potential for AR/VR in museums

New collaboration with zSpace

This collaboration also resulted in:



QUID PRO
QUO



How could this work for your institution?

Do your
research

technology

resources

Find
collaborative
partnerships

tech companies

other institutions

Be creative in
implementation
process

customization

manpower

Dani Marshall

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QUESTIONS?

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Interpretations
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