

# Connected Culture and Natural Heritage in the Northern Environment

Digitising Artefacts



Northern Periphery and  
Arctic Programme  
2014-2020



EUROPEAN UNION

Investing in your future  
European Regional Development Fund

Equipment and Selection

Photography and Lighting

Structure from Motion

Archiving and Social Archiving

Virtual Museums and Exhibits

# Artefacts and Scenes

Subject selection

Equipment and software

Set up and shoot

Processing

Archiving

Exhibits

Virtual Museum



# Artefacts and Scenes



Artefact Selection

# Artefact selection

Gateway to lives and stories

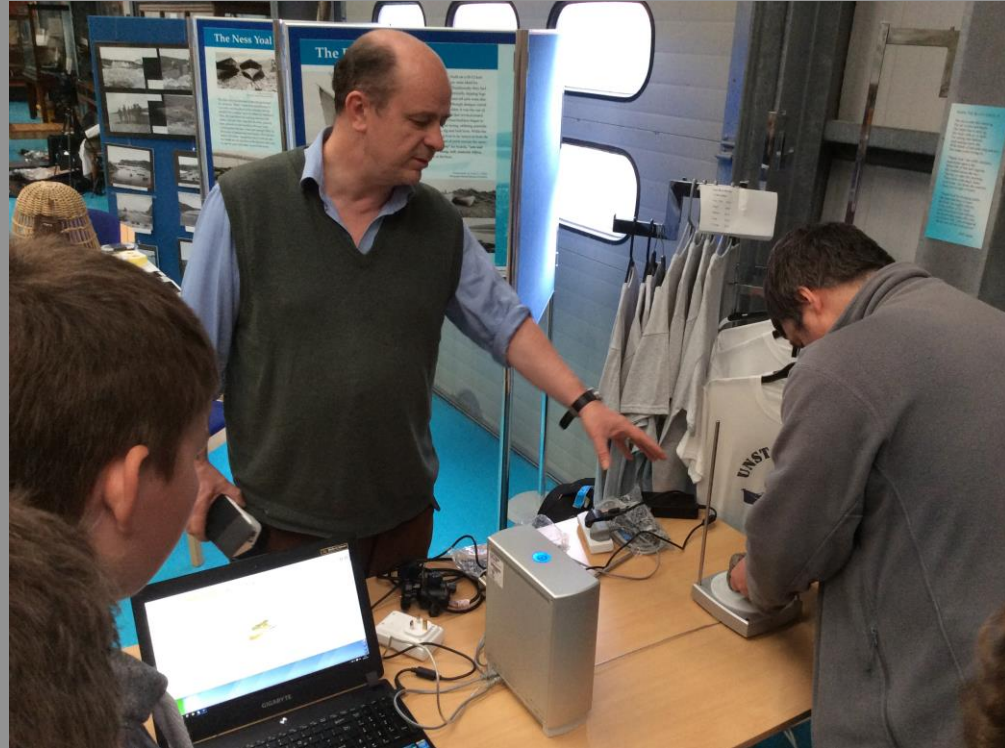
Digitises well

- Matt surface
- Fixed surface
- Not occluded
- Appropriate Size
- Features

Digitises poorly

- Reflective, moving, extreme sizes, featureless

Select objects for digitisation



# Selecting Objects



Excellent Targets

Textured, vivid, and rough items make excellent models.



Suboptimal Targets

Reflective, transparent, and untextured, homogenous objects do not make good models.



Lighting Matters

Diffuse, even lighting, and soft shadows usually result in good models.



Lighting Matters

Spotlights, hard shadows, and uneven lighting generally results in incomplete models.

SKIP



SKIP



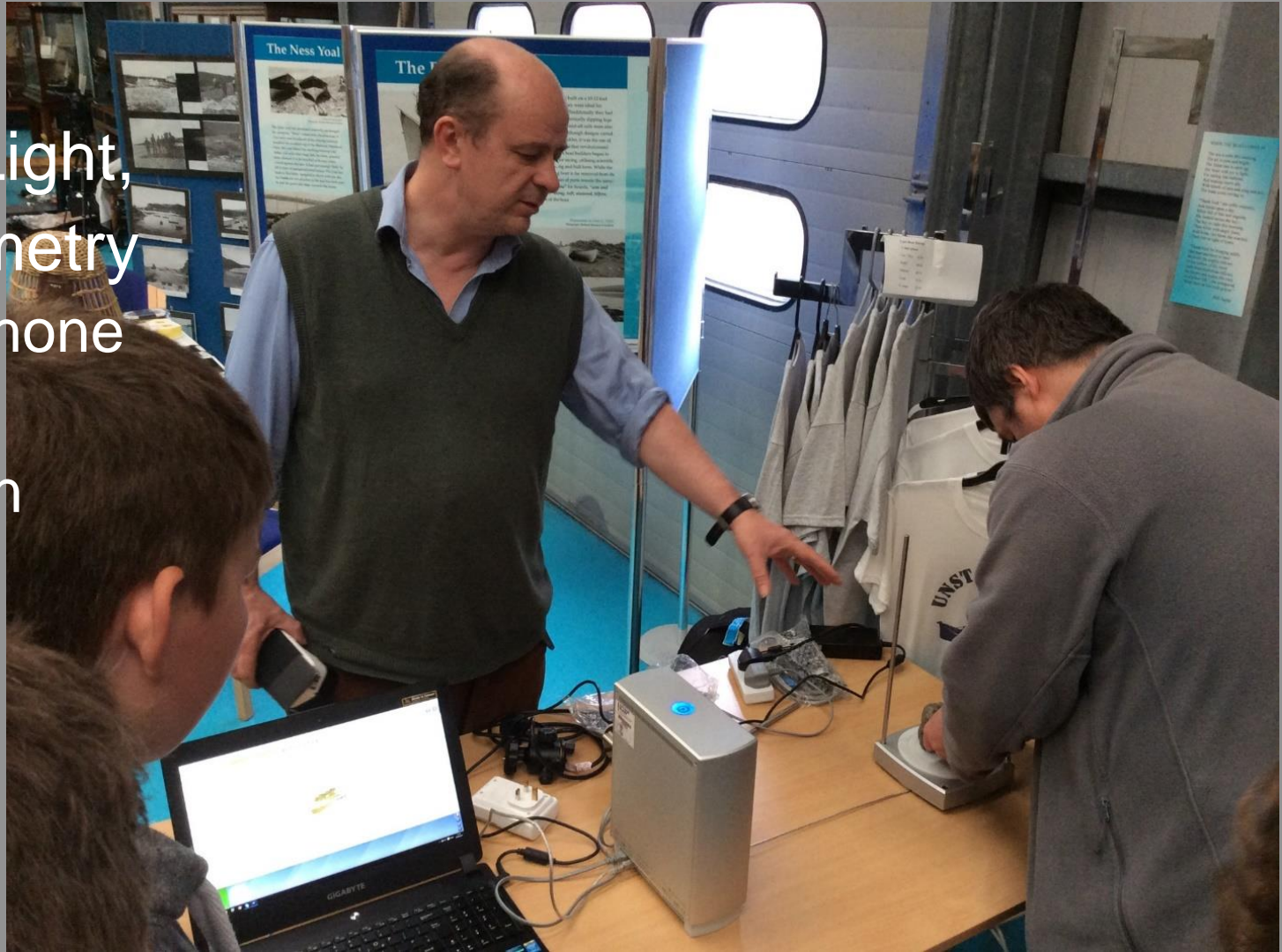
SKIP



SKIP



Laser Scan,  
Structured Light,  
Photogrammetry  
Camera /phone  
Tripod  
Lazy Susan  
Softbox  
Lights  
Computer



Equipment and Selection

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Soft Lighting  
Camera on fixed manual settings

# Set Up and Shoot: Artefacts

Narrow aperture

Low ISO

Long exposure

Fixed white balance

Use a tripod for stability

Make sure it is in focus

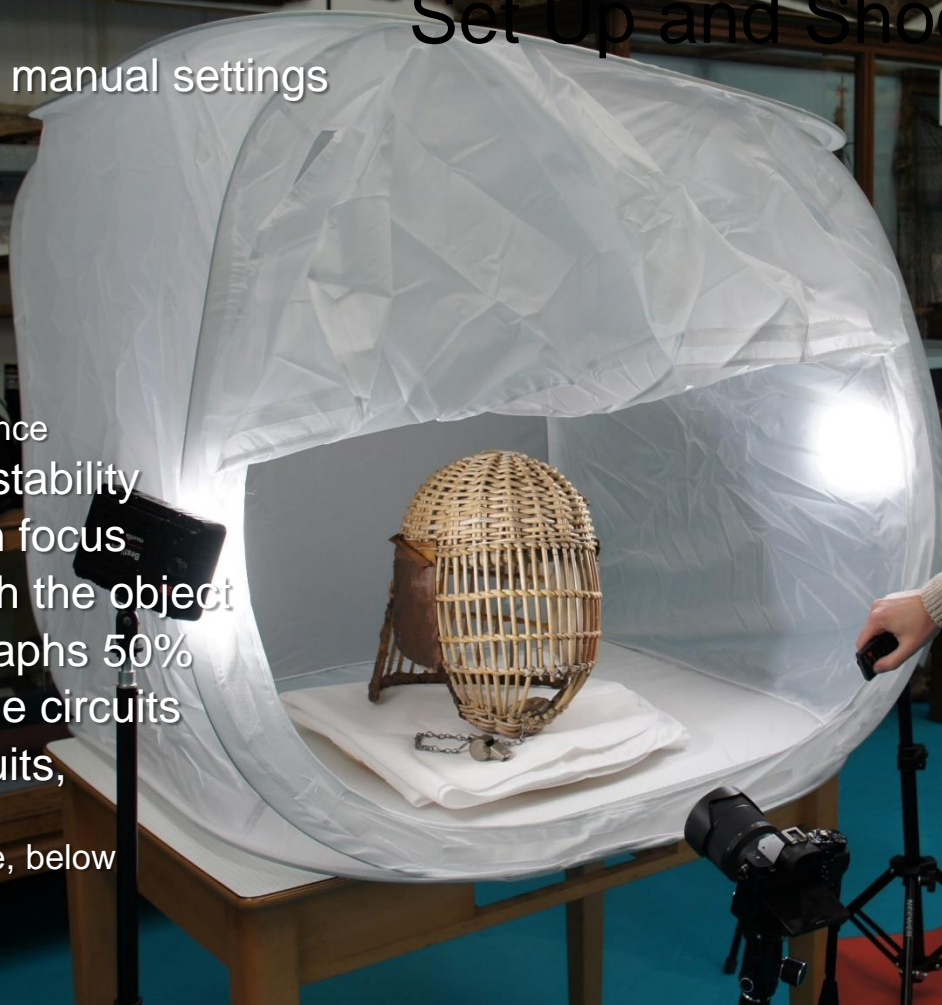
Fill the frame with the object

Overlap photographs 50%

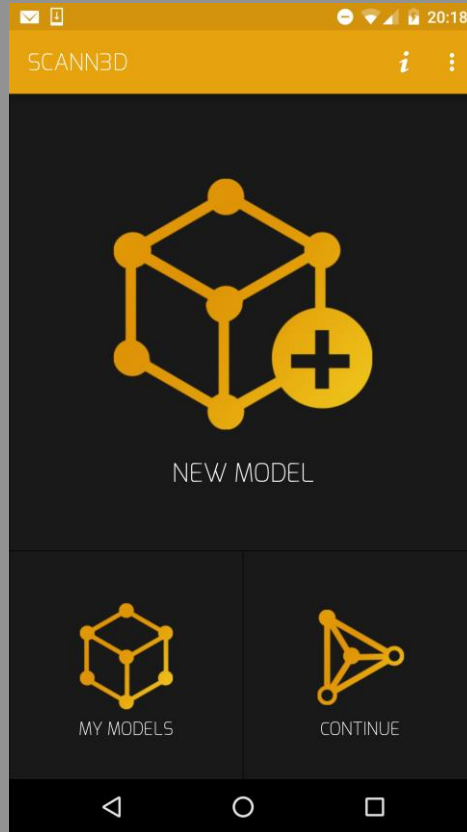
Shoot 360 degree circuits

Shoot three circuits,

horizontal, above, below



# Phone photogrammetry



Equipment and Selection

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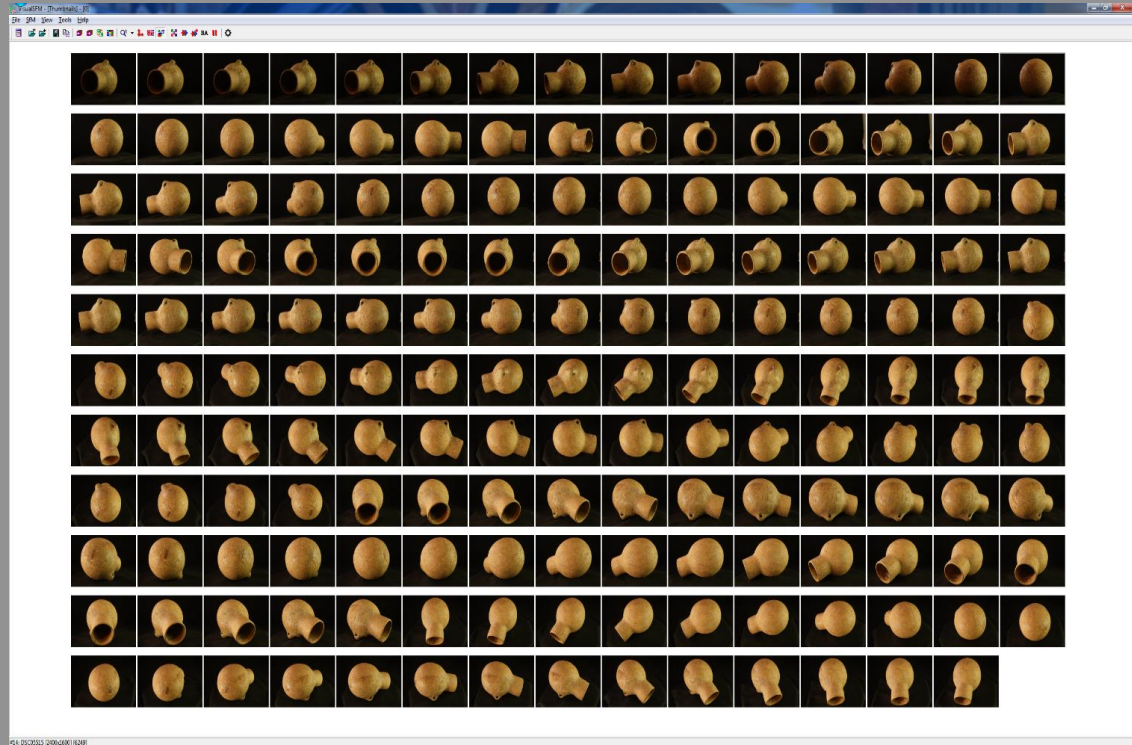
# Processing artefacts

- Select and sort images
- Sift and match
- Create a sparse points cloud
- Create a dense points cloud
- Export to mesh lab
- Trim dense point cloud
- Create a mesh
- Apply texture

# Photogrammetry Using Visual SFM & Meshlab

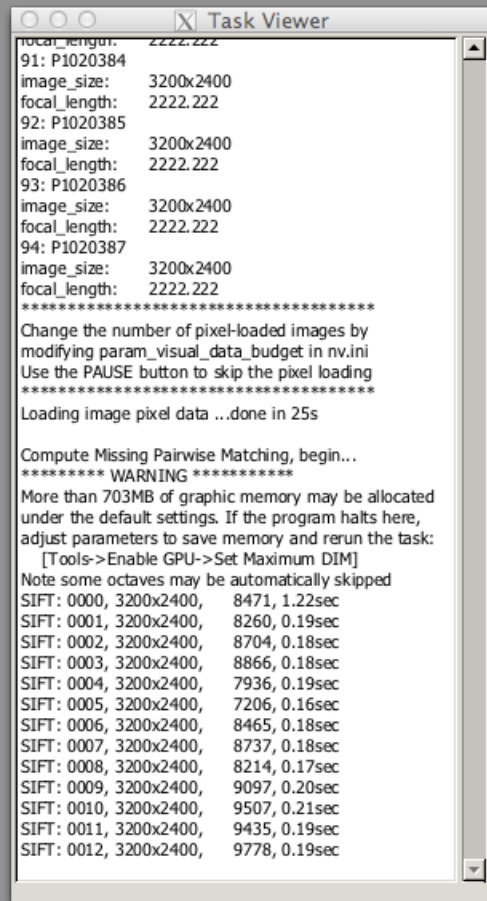
# Processing: artefacts with Visual FSM and Meshlab

- Download Select and import pictures
- Remove bad pictures
- Ensure complete coverage and overlap
- 20-60 should be plenty
- Lower resolution images (1280\*980) may work better



# Processing: artefacts with Visual FSM and Meshlab

- Sift and match
- Create a Sparse points cloud
  - Check and remove bad camera locations
- Create a Dense points cloud.

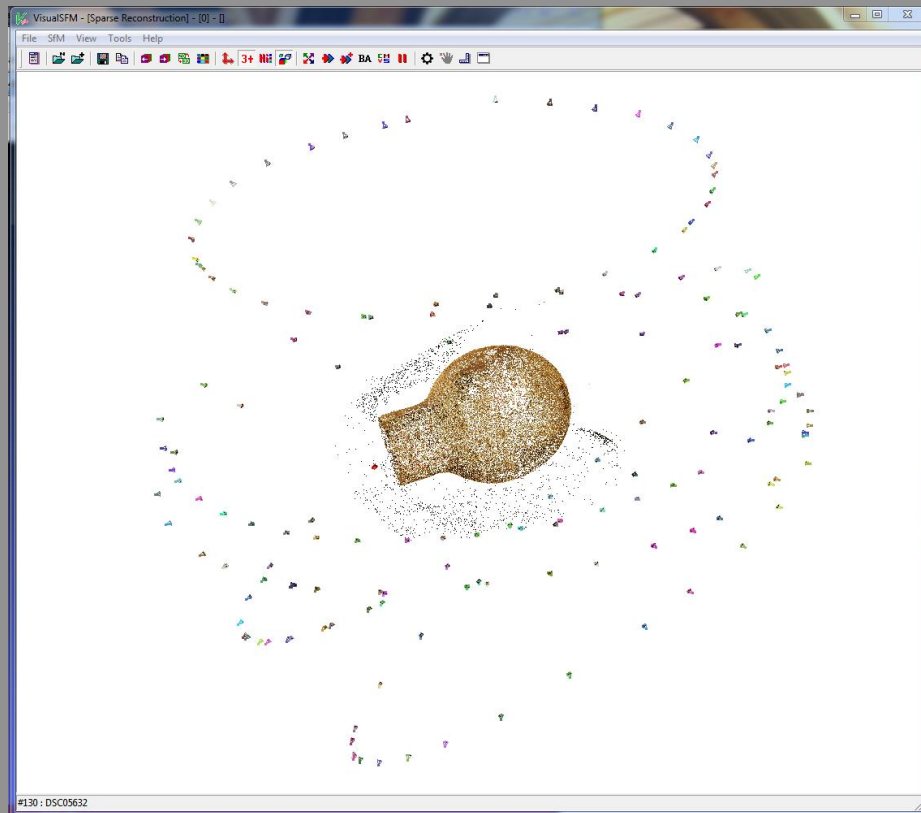


```
Task Viewer
focal_length: 2222.222
91: P1020384
image_size: 3200x2400
focal_length: 2222.222
92: P1020385
image_size: 3200x2400
focal_length: 2222.222
93: P1020386
image_size: 3200x2400
focal_length: 2222.222
94: P1020387
image_size: 3200x2400
focal_length: 2222.222
*****
Change the number of pixel-loaded images by
modifying param_visual_data_budget in nv.ini
Use the PAUSE button to skip the pixel loading
*****
Loading image pixel data ...done in 25s

Compute Missing Pairwise Matching, begin...
***** WARNING *****
More than 703MB of graphic memory may be allocated
under the default settings. If the program halts here,
adjust parameters to save memory and rerun the task:
[Tools->Enable GPU->Set Maximum DIM]
Note some octaves may be automatically skipped
SIFT: 0000, 3200x2400, 8471, 1.22sec
SIFT: 0001, 3200x2400, 8260, 0.19sec
SIFT: 0002, 3200x2400, 8704, 0.18sec
SIFT: 0003, 3200x2400, 8866, 0.18sec
SIFT: 0004, 3200x2400, 7936, 0.19sec
SIFT: 0005, 3200x2400, 7206, 0.16sec
SIFT: 0006, 3200x2400, 8465, 0.18sec
SIFT: 0007, 3200x2400, 8737, 0.18sec
SIFT: 0008, 3200x2400, 8214, 0.17sec
SIFT: 0009, 3200x2400, 9097, 0.20sec
SIFT: 0010, 3200x2400, 9507, 0.21sec
SIFT: 0011, 3200x2400, 9435, 0.19sec
SIFT: 0012, 3200x2400, 9778, 0.19sec
```

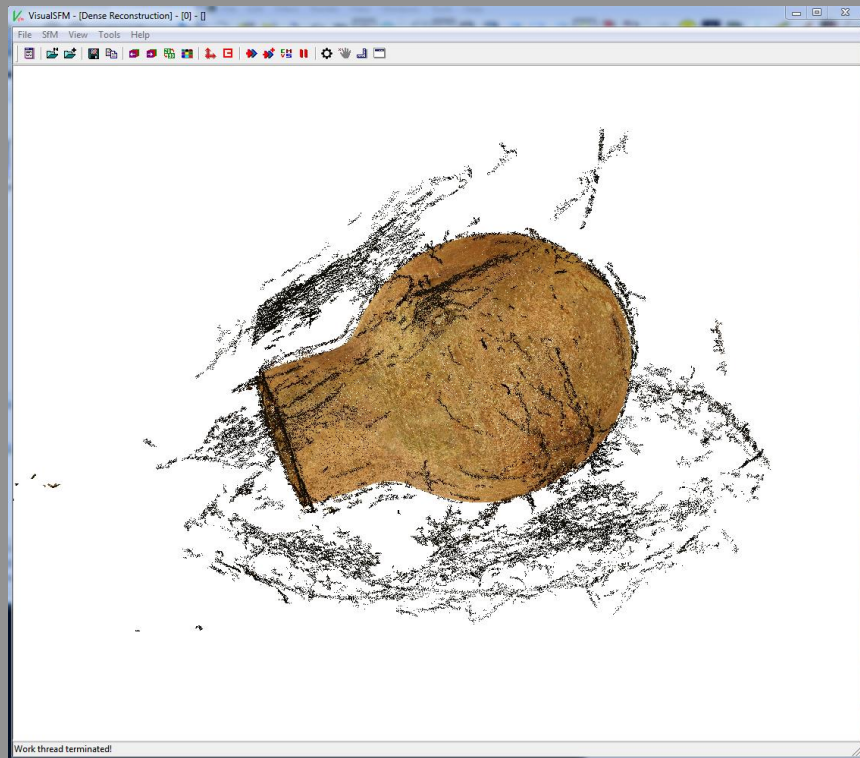
# Processing artefacts

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Equipment and Selection

Photography and Lighting

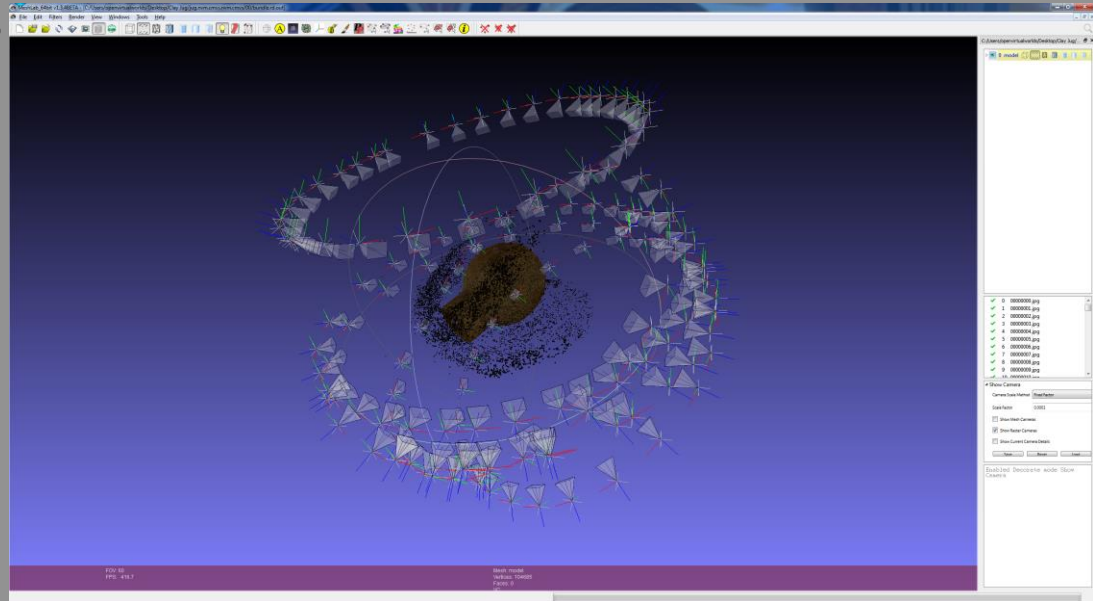
Structure from Motion

Archiving and Social Archiving

Virtual Museums and Exhibits

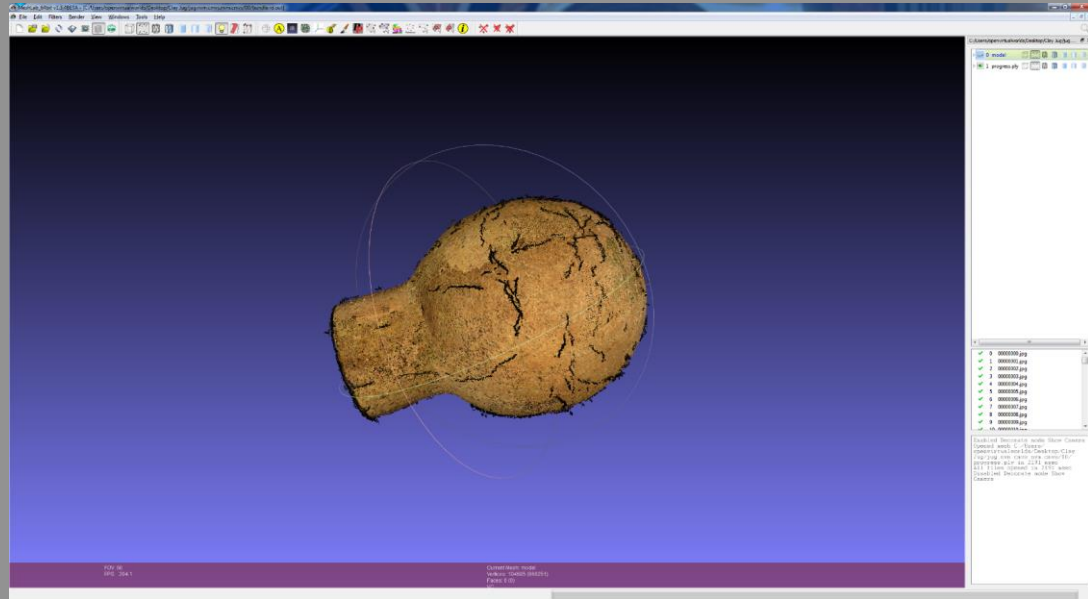
# Processing artefacts: Meshlab

- Import points clouds into meshlab
- Delete unwanted points
- Create mesh from points
- Clean up mesh
- Apply textures
- Export model



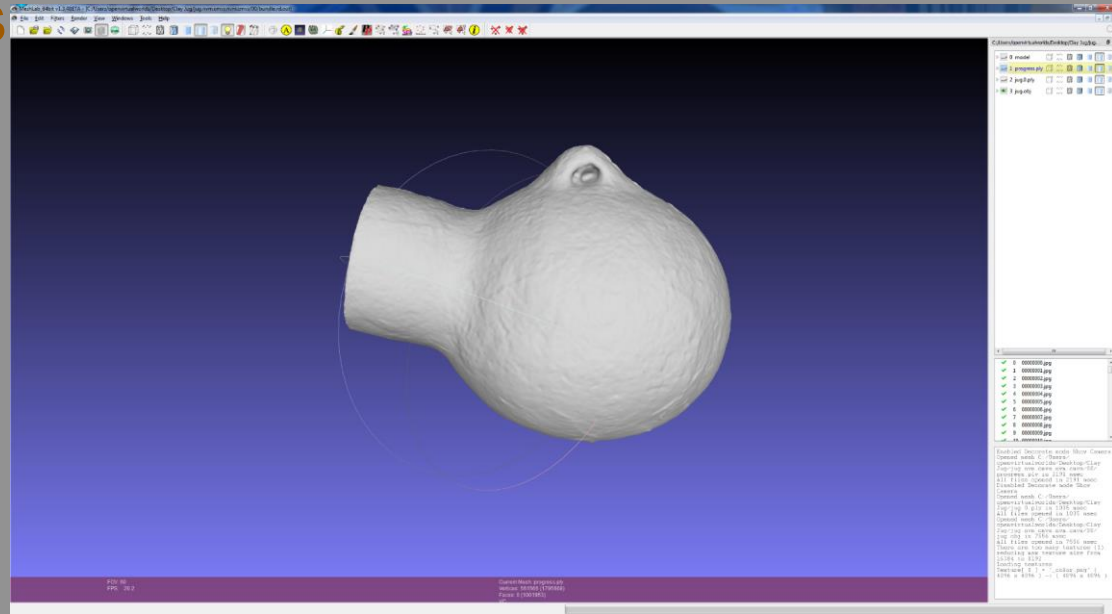
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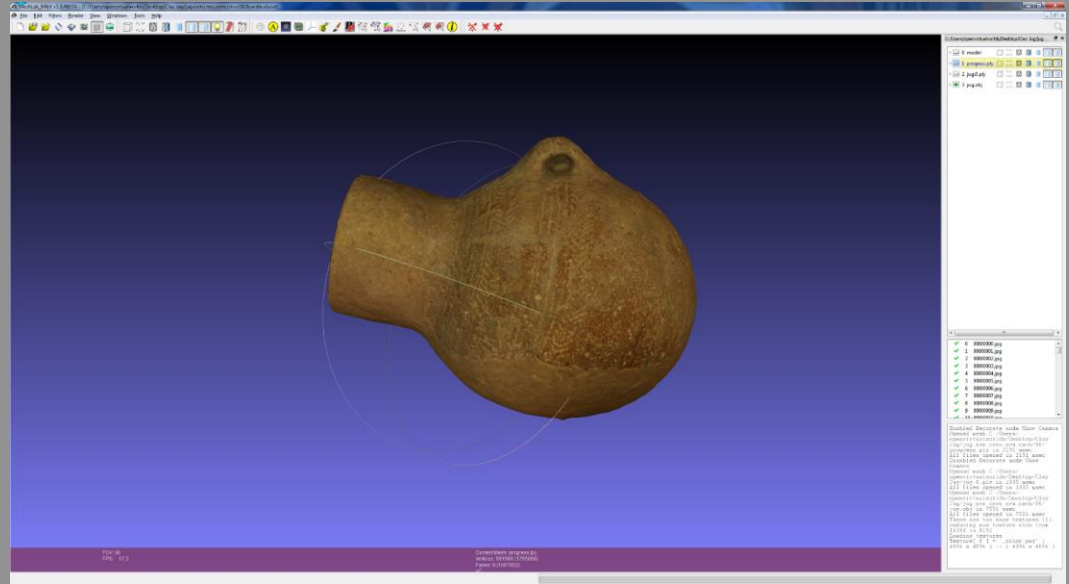
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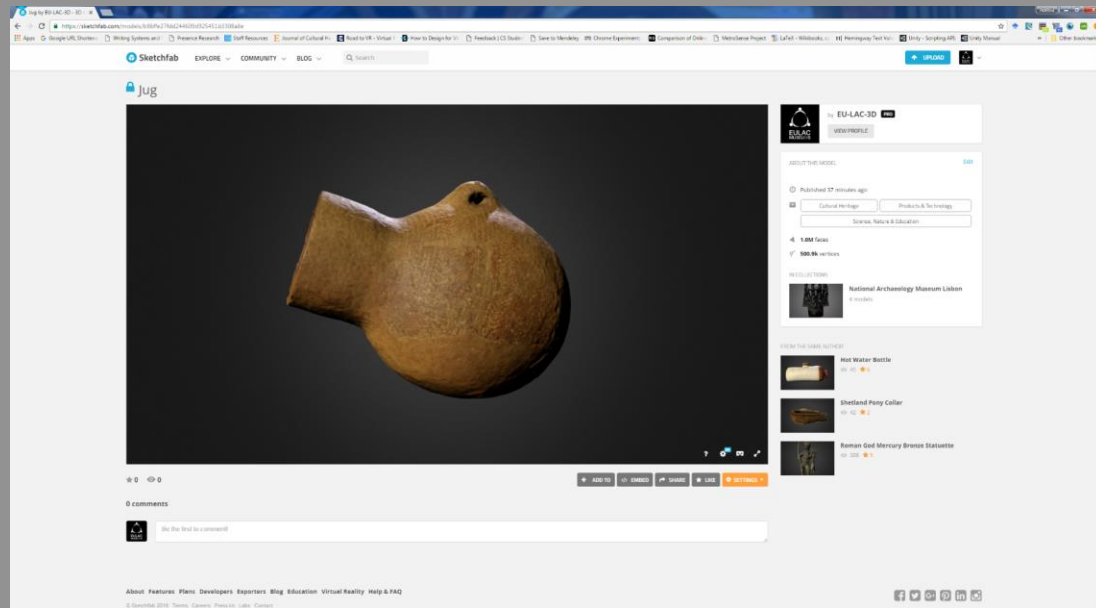
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# CINE

See into the past

**Project area**



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# Exhibits

- Virtual
  - Artefact Galleries
  - Virtual Reality
  - Museum without walls
  - Wiki
- Physical
  - 3D Printing



Interpretation



# Archiving

- Archive high definition model
- Where possible include original photographs
  - This will future proof the artefact and enable it to be used in future platforms
- Make accessible through upload:
  - Artefacts: sketchfab
  - Spheres: roundme, google maps
- Include meta data in particular location.

- Dashboard
- Items**
- Collections
- Item Types
- Tags
- Exhibits
- Simple Pages
- Dropbox
- BagIt
- Bulk Editor
- Comments
- CSV Import
- Embedded Items
- Fedora Connector
- Map
- OAI-PMH Harvester

## Add an Item

Press **F11** to exit full screen



...

**Dublin Core**

Item Type Metadata

Scripto

Files

Zoom

Tags

Fedora

Map

ImageMap

### Dublin Core

The Dublin Core metadata element set is common to all Omeka records, including items, files, and collections. For more information see, <http://dublincore.org/documents/dces/>.

**Title**

A name given to the resource

**Add Input**Use HTML **Subject**

The topic of the resource

**Add Input**Use HTML **Description**

An account of the resource

**Add Input****Add Item**Public:  Featured: **Collection**

Select Below ▼

# Item Types

EU-LAC

Plugins Appearance Users Settings **Welcome, Super User** Log Out

Dashboard
Items
Collections
<b>Item Types</b>
Tags
Exhibits
Simple Pages
Dropbox
BagIt
Bulk Editor
Comments
CSV Import
Embedded Items
Fedora Connector
Map

Add an Item Type

Type Name	Description	Total Items
<b>Text</b> Edit	A resource consisting primarily of words for reading. Examples include books, letters, dissertations, poems, newspapers, articles, archives of mailing lists. Note that facsimiles or images of texts are still of the genre Text.	0
<b>Moving Image</b> Edit	A series of visual representations imparting an impression of motion when shown in succession. Examples include animations, movies, television programs, videos, zoetropes, or visual output from a simulation.	0
<b>Oral History</b> Edit	A resource containing historical information obtained in interviews with persons having firsthand knowledge.	0
<b>Sound</b> Edit	A resource primarily intended to be heard. Examples include a music playback file format, an audio compact disc, and recorded speech or sounds.	0
<b>Still Image</b> Edit	A static visual representation. Examples include paintings, drawings, graphic designs, plans and maps. Recommended best practice is to assign the type Text to images of textual materials.	0
<b>Website</b> Edit	A resource comprising of a web page or web pages and all related assets ( such as images, sound and video files, etc. ).	0
<b>Event</b> Edit	A non-persistent, time-based occurrence. Metadata for an event provides descriptive information that is the basis for discovery of the purpose, location, duration, and responsible agents associated with an event. Examples include an exhibition, webcast, conference, workshop, open day,	0

Search:



Item ID	Title	Description	Added	Updated
1	<a href="#">Museum Nord</a>	Museum Nord is a non-profit, government-supported organisation within the national museum network, operating 21 different museums in northern Nordland. Museum Nord contributes to the collection and documentation of historic sites and objects, carrying out research, and disseminating and promoting the cultural and natural history of Ofoten, Vesterålen and Lofoten. In this context the museum works with the preservation of archaeological and architectural monuments and physical environments of cultural significance. Museum Nord was founded in 2002 with the aim to consolidate and professionalise all the public museums in these three regions, and to communicate heritage knowledge to a wider audience.	Friday 15th of September 2017 11:32:07 AM	Friday 23rd of February 2018 10:48:06 AM
2	<a href="#">Museum Nord Collection</a>		Friday 15th of September 2017 11:48:57 AM	Friday 23rd of February 2018 10:53:28 AM
3	<a href="#">Norwegian Fishing Village Museum</a>	Welcome to Å, at the end of E10: the King Olav's Road. Here you will find the picturesque Norwegian Fishing Village Museum, and experience everyday life at the Lofoten fisheries over the last 250 years. Visit our buildings. Participate in demonstrations and activities: • The old stone oven bakery (1844) with delicious bread and cinnamon buns • The big boat house, with traditional wooden boats (Nordland boats) • The cod liver oil factory – and increase your vitamin D dose • The home of the fisherman's family • LATEST EXHIBITION! The post office, where the expedition of the steam ships were held • The drying loft with temporary exhibitions • The woodshed • The Forge, where the blacksmith was working • Historical gardens • The old grocery shop, located in a house built in 1843. Locally produced food, textiles, local literature, clothing, fishing equipment – and a basic selection of groceries • Activity room, specially made for children The Norwegian Fishing Village Museum offers guiding in Norwegian, English and Spanish, from 15 to 60 minutes. In the summer season guiding may be available in other languages.	Friday 15th of September 2017 12:24:32 PM	Thursday 18th of January 2018 11:26:33 AM
			Friday 15th	







cineg 📍 Northern Peripheries and Arctic Regionh

Seeing the past imagining the future

EDIT PROFILE

1 Follower

2 Followings



SUMMARY

54 MODELS

**COLLECTIONS**

0 LIKES

UPLOADS

Iceland

2 📶 0

Timespan

10 📶 1

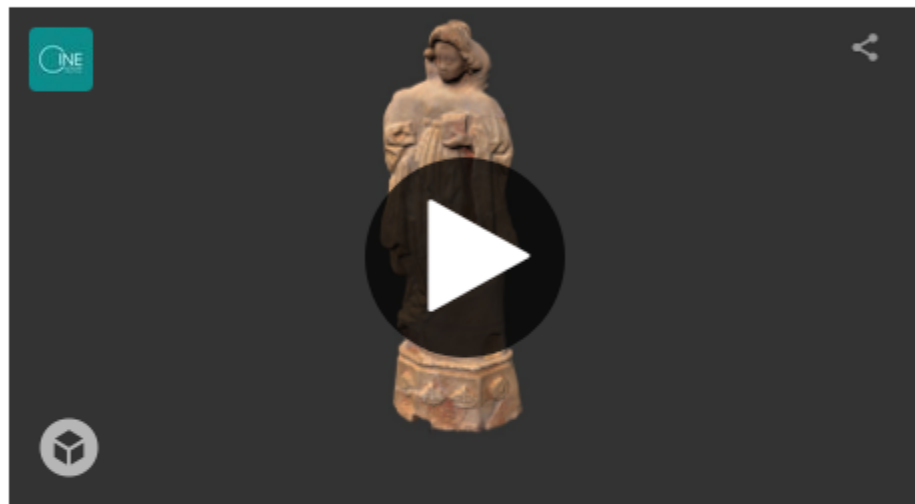
Callanish 14

4 📶 0





## Preview



**St Barbara Statue** by [cineg](#) on [Sketchfab](#)

## Embed code

Format:

iframe

Size:

640

x

480

```
<div class="sketchfab-embed-wrapper"><iframe width="640" height="480"
```

## Options

- Autostart
- Animated entrance
- Turntable animation
- Preload textures
- Preselect annotation
- Annotation autopilot

None ▾

PRO OPTIONS:

[Upgrade To Unlock](#)

- Transparent background

PREMIUM OPTIONS:

[Upgrade To Unlock](#)

- Hide controls
- Hide model info

BUSINESS OPTIONS:

[Upgrade To Unlock](#)

- Remove watermark link

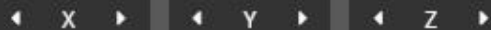


SAVE VIEW



GENERAL

Straighten model



Show advanced rotation

Renderer

Classic

PBR

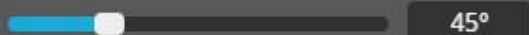
Matcap

Shading

Lit

CAMERA

Field Of View



Limit orbit camera

Upgrade to **Sketchfab PRO** to use the limit orbit camera

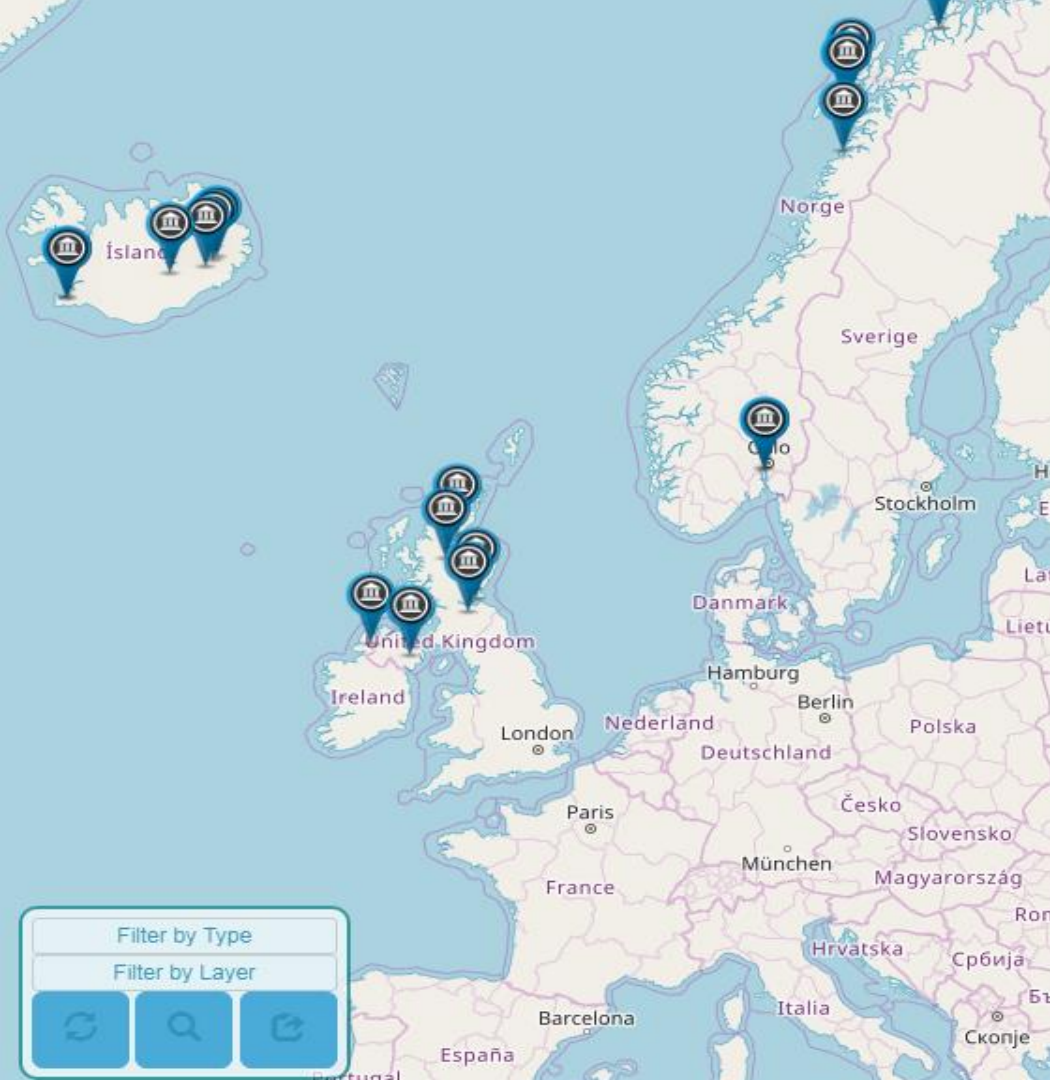
Equipment and Selection

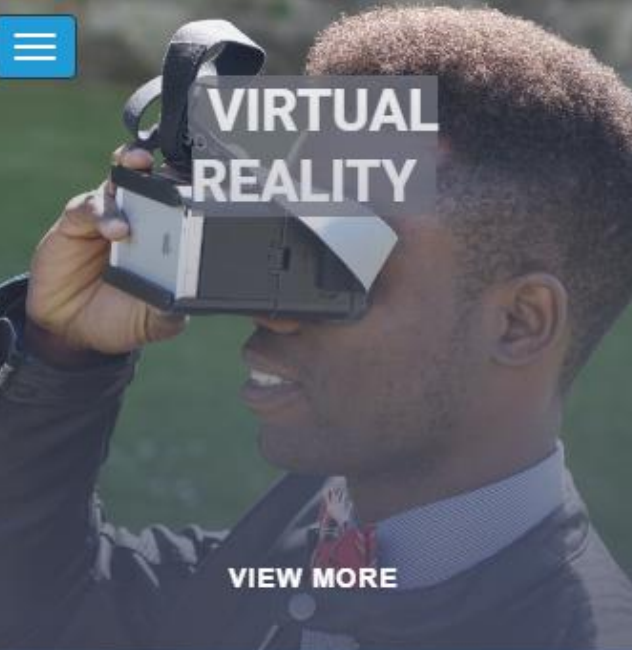
Photography and Lighting

Structure from Motion

Archiving and Social Archiving

Virtual Museums and Exhibits







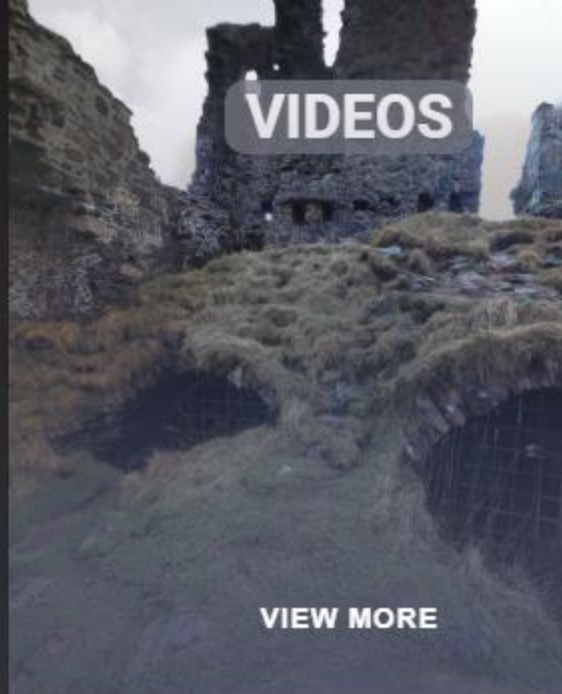
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Museums and other institutions

### Pages in category ‘Museums’

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- [Aurora Borealis Multimedia AS](#)

#### C

- [Callanish Visitor Centre](#)

#### D

- [Donegal County Museum](#)

#### F

- [Fljótsdalshreppur Municipality](#)

#### G

- [Minjastofnun Íslands](#)
- [Museum Nord](#)

#### N

- [Nordland Fylkeskommune](#)

#### R

- [Riksantikvaren](#)

#### T

- [The Museum of the University of St Andrews](#)
- [Timespan - Helmsdale Heritage and Arts Society](#)
- [Tromsø Universitetsmuseet](#)

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[Museums](#)

[Collections](#)

[Objects](#)

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[Page information](#)

# Resources

- Tutorial for Visual SFM and Meshlab
  - <http://abcb.fyi/visualsfm-tutorial>
- Download Visual SFM
  - <http://ccwu.me/vsfm/>
- Tutorial for MeshLAB
  - <http://www.cse.iitd.ac.in/~mcs112609/Meshlab%20Tutorial.pdf>
- Download MeshLAB
  - <http://www.meshlab.net/>
- SketchFAB
  - <https://sketchfab.com/>
- Virtual museum upload
  - cineg.org
- Photogrammetry Toolkit
  - <https://cineg.org/wordpress/toolkits/photogrammetry/>
- Photogrammetry Trello board
  - <https://trello.com/b/ADe37pa1/digital-artefacts>
- Photogrammetry **Wiki**
  - [https://cineg.org/wiki/index.php/Digital\\_Artefacts](https://cineg.org/wiki/index.php/Digital_Artefacts)

