



Grafica 3D per i beni culturali: 3D scanning in MeshLab

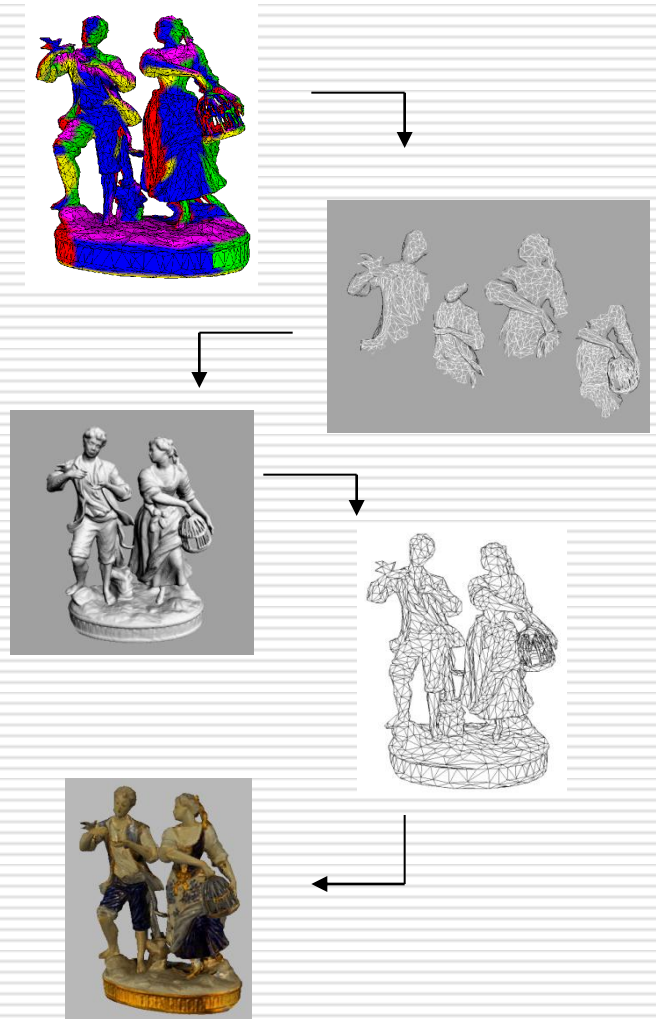
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Layers Management


3D Scanning Pipeline

- [**Acquisition planning**]
- **Acquisition** of multiple range maps
- Range map **filtering**
- **Registration** of range maps
- **Merging** of range maps
- Mesh **Editing**
- Interactive **visualization**
- **Capturing/Integration** of **appearance** (color acquisition, registration, mapping on surface, color visualization)
- Archival and data conversion



Alignment in Meshlab

The alignment of a number of meshes can be done using a filter in MeshLab

Procedure: 

- Load the range maps as layers
 - Glue the first one (hide the others)
 - For each mesh, use Point Based Glueing to find the rough alignment
 - Every 4-5 range maps aligned, launch Process
 - If needed, correct the alignment error
 - Parameters: Min. starting dist, Sample number
 - Save the aln or mlp file

 - Video Tutorial:
 - <http://www.youtube.com/watch?v=4g9Hap4rXok&list=PL53FAE3EB5734126E&index=1>
 - http://www.youtube.com/watch?v=UrJqKIF_tAc&list=PL53FAE3EB5734126E&index=2
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Merging in Meshlab (1)

There are several ways to merge the range maps in a unique mesh.

- 1) Remeshing, simplification and reconstruction -> Surface Reconstruction:VCG

Procedure:

- Load the aln file
 - Launch the reconstruction
Parameters: Voxel Side, SubVol splitting
 - If the merging is split, make all the subblocks visible and launch Layer and attribute management -> Flatten visible layers
 - Clean!
 - Save the final model

 - Videotutorial:
<http://www.youtube.com/watch?v=Ye95yhvjYJM&list=PL53FAE3EB5734126E&index=3>
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Merging in Meshlab (2)

There are several ways to merge the range maps in a unique mesh.

2) Remeshing, simplification and reconstruction -> Surface Reconstruction:
Poisson

Procedure:

- Load the aln file
 - Layer and attribute management -> Flatten visible layers
 - Launch the reconstruction
Parameters: Octree Depth, Solver divide
 - Clean!
 - Save the final model

 - Videotutorial:
http://www.youtube.com/watch?v=dTkiPsNZg_o&list=PL53FAE3EB5734126E&index=4
 - <http://www.youtube.com/watch?v=JvTt5VjmWNQ&list=PL53FAE3EB5734126E&index=5>
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Next in line...

Next lesson:

- Mesh processing

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