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

15-21 Marzo 2013
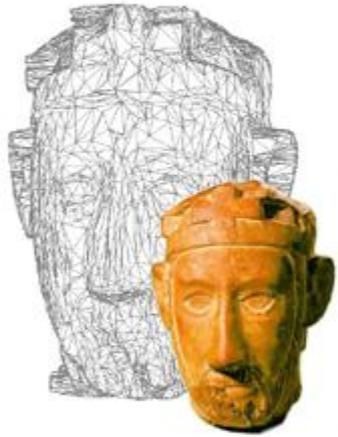
Layers Management

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
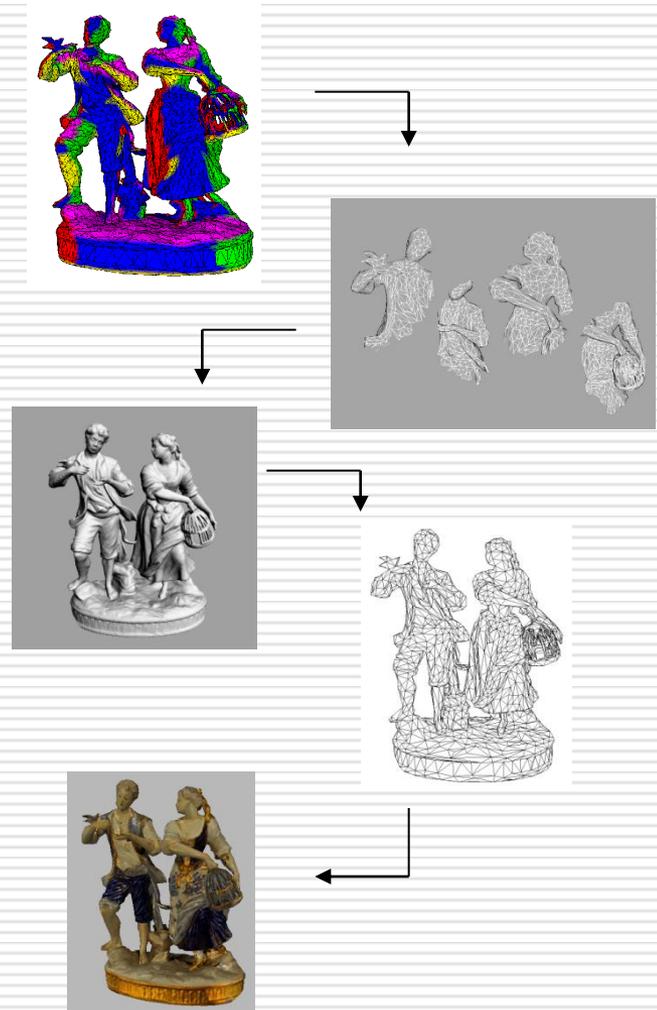
Alignment in Meshlab

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=4g9Hap4rX0k&list=PL53FAE3EB5734126E&index=1
- http://www.youtube.com/watch?v=UrJqKIF_tAc&list=PL53FAE3EB5734126E&index=2

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

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_0&list=PL53FAE3EB5734126E&index=4

- http://www.youtube.com/watch?v=JvTt5VjmWNQ&list=PL53FAE3EB5734126E&index=5

Next in line…

Next lesson:

- Mesh processing

Contacts:

Matteo Dellepiane

c/o ISTI-CNR Via G. Moruzzi 1

56124 Pisa (PI)

Tel. 0503152925

E-Mail: dellepiane@isti.cnr.it

Personal website: http://vcg.isti.cnr.it/~dellepiane/

VCG website: http://vcg.isti.cnr.it