Visualizzazione avanzata

Lezione 16: 17 Maggio 2013

Advanced visualization

MultiTriangulation:

Handling extremely complex geometries in real-time

Efficient rendering of very large static meshes

- Memory bound (nearly 10M)
- Fps bound (at least 10 fps)

Multiresolution approach

(out of core management, Low CPU usage, Exploitation of GPU power)

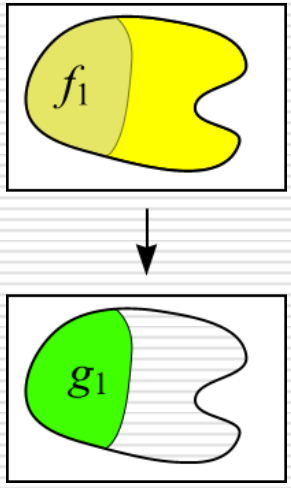
MultiTriangulation approach

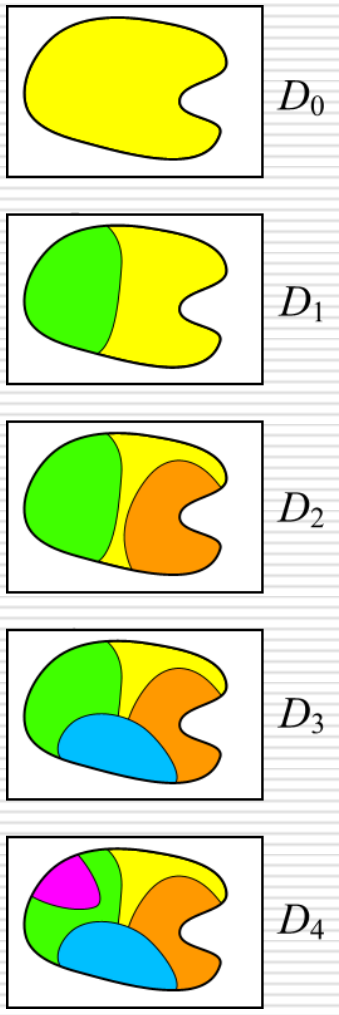
(sequence of local modifications over a given description *D*)

MultiTriangulation approach

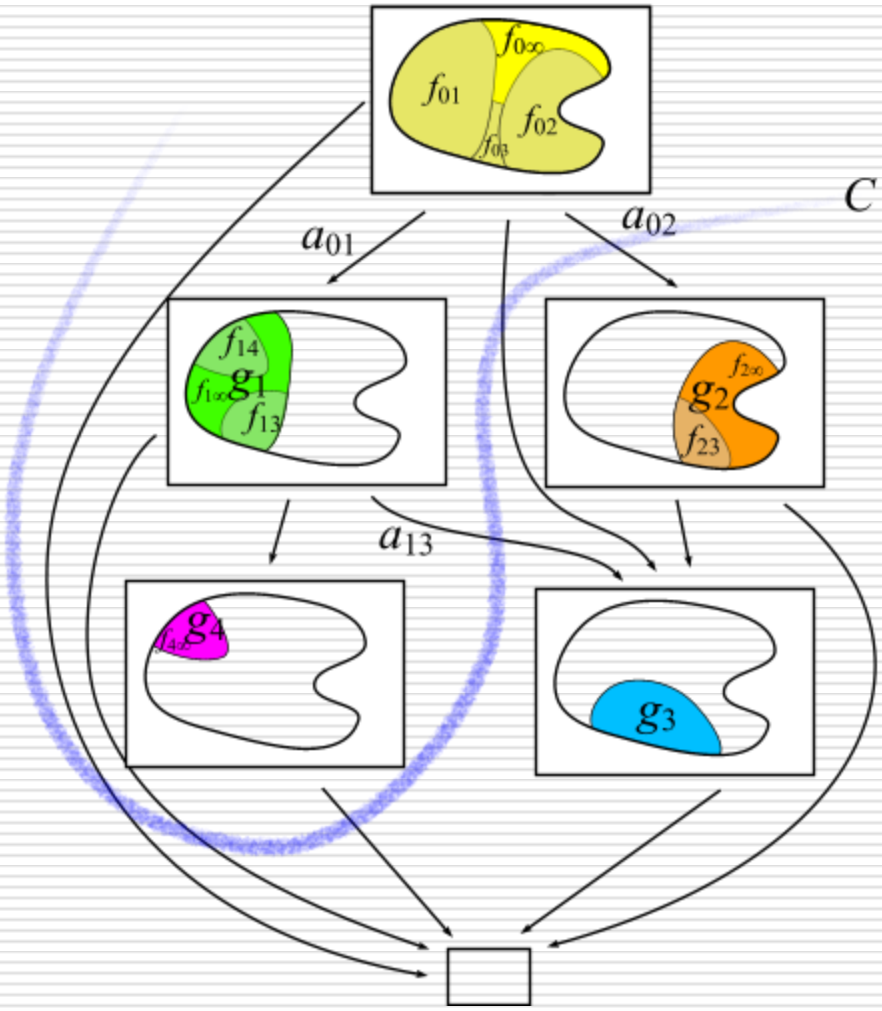
Consider a sequence of local modifications over a given description *D*

- Each modification replaces a portion of the domain with a different conforming portion (simplified)
- $\boldsymbol{f_1}$ floor
- $\boldsymbol{g_1}$ the new fragment

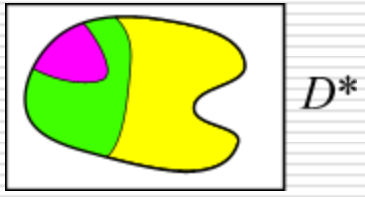




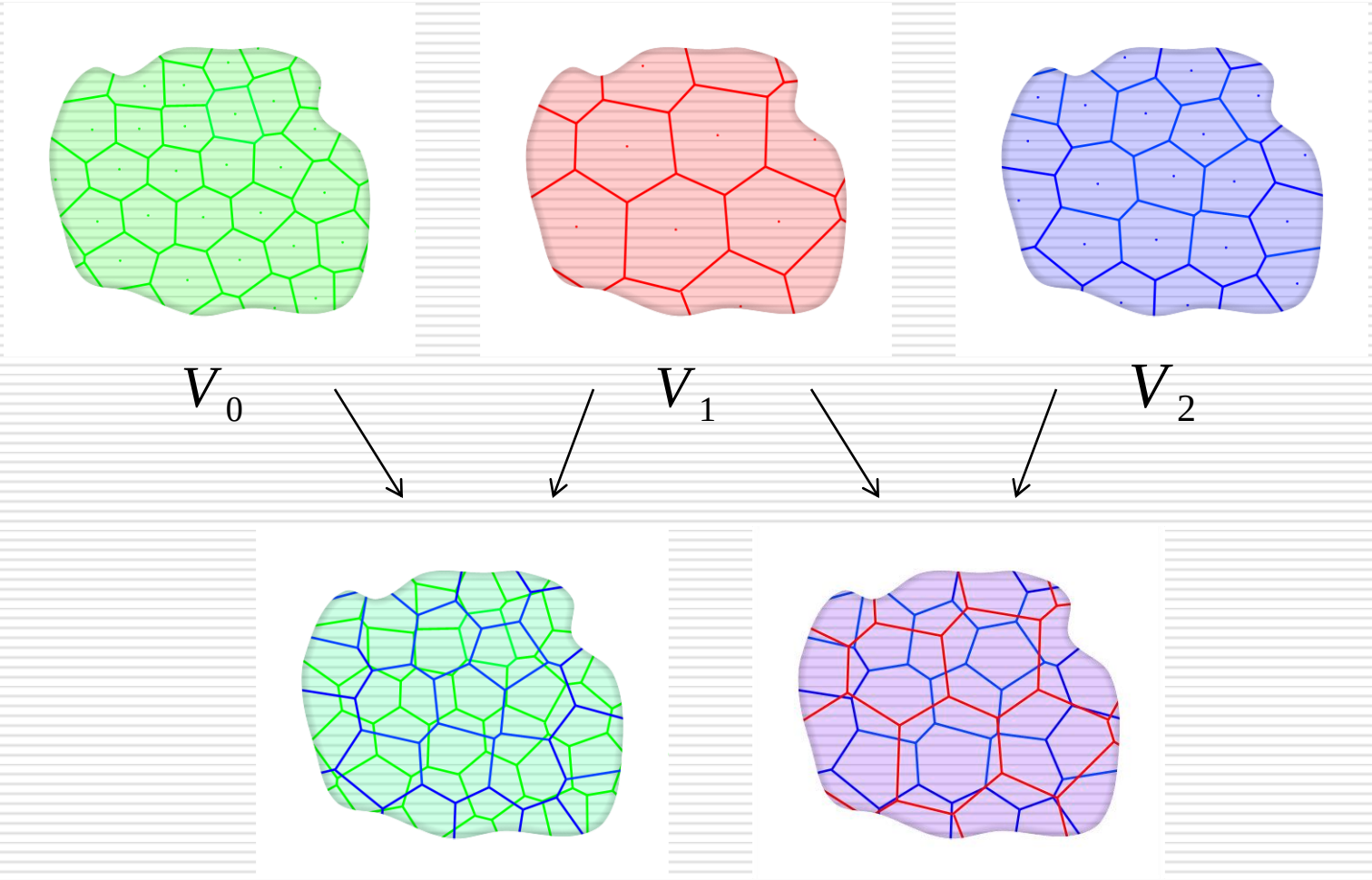
MultiTriangulation approach



- Dependence between modifications can be arranged in a DAG (Direct Acyclic Graph)
- A cut on the DAG defines a new representation.
- Paste all the fragment inside the cut



MultiTriangulation approach



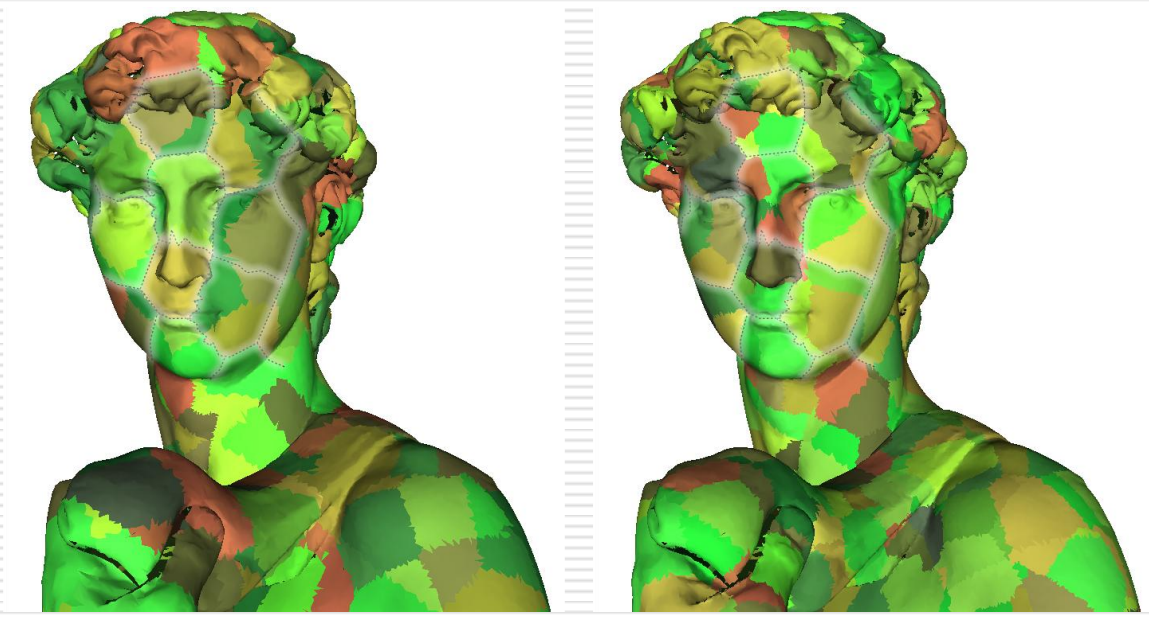
MultiTriangulation approach

- Voronoi partitioning of space

- Regularly sampled seeds

- Out of core, time critical rendering

- View dependent measure of error.



MultiTriangulation: pros and cons

- Flexible (not only triangulated surfaces)
- Up to more than 1G triangles
- Real time navigation

- Texturing
- Disk space occupation
- No editing

Advanced visualization

3D models embedded in PDF:

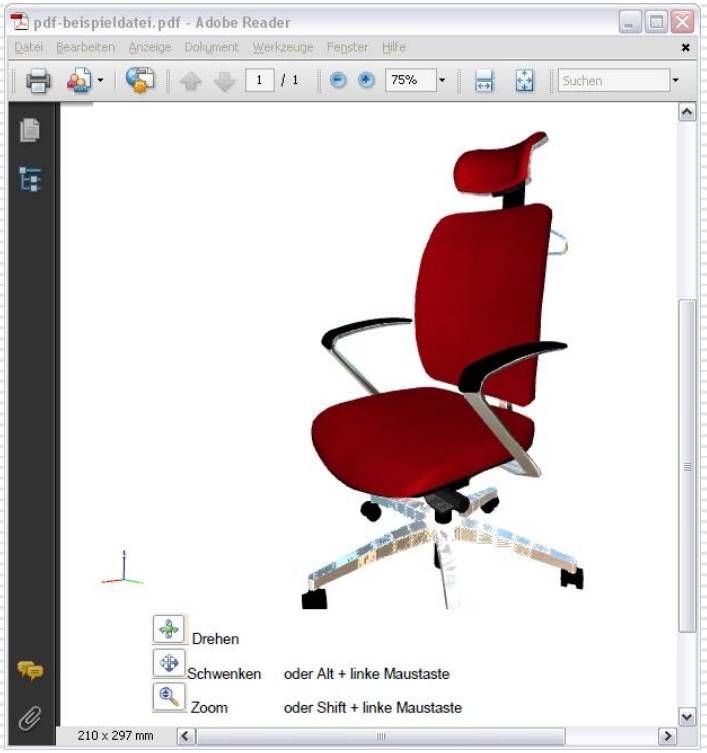
Integrating 3D navigation in text files

3D models in PDF

In 2007, Adobe launched the possibility to embed 3D models in PDF files.

Several nice features are available:

- Navigation
- Rendering and lighting
- Viewpoint definition
- Hotspots
- Other stuff

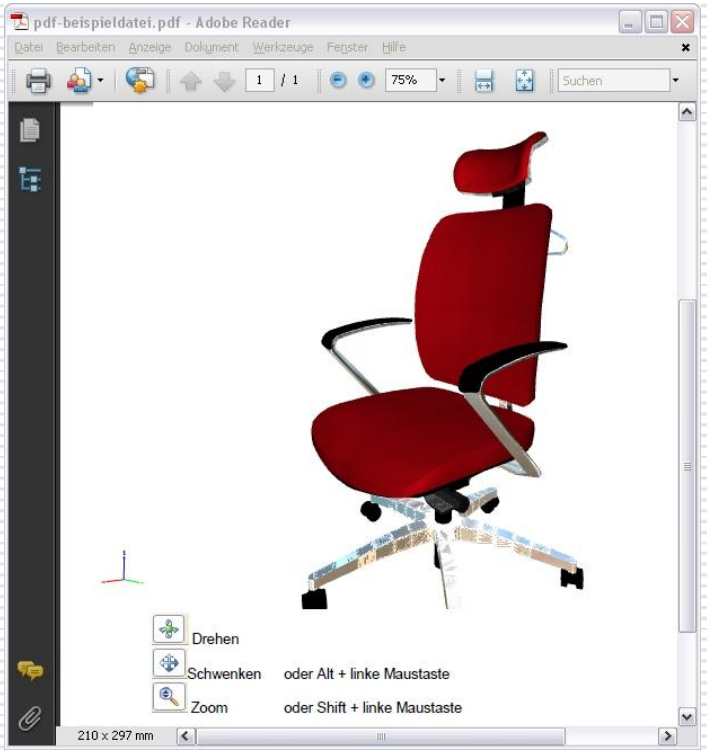


3D models in PDF

In order to save a PDF 3D in MeshLab, you need to:

- Export mesh ad U3D
- Load the saved .tex file in a Latex compiler (i.e. TexWorks, distributed together with MikTex)
- Compile it

You will obtain a starting 3D model.



Next in line…

Next lesson:

- WebGL

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