

Analysis of Micro Vascular Networks

EEF Summer School on Massive Data Sets

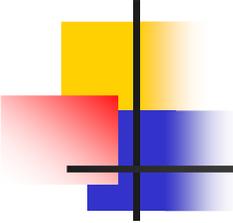
Steffen Prohaska



Zuse Institute Berlin

Indeed
Visual Concepts

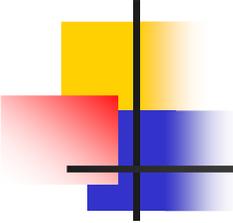




Project Overview

- n Analysis of image data of capillaries in human brain
 - n Confocal microscopy (blockwise scan)
 - n Synchrotron CT
- n Analysis
 - n Network topology
 - n Morphometry of single vessels
 - n Statistical analysis of morphometry of network
- n Visualization and interactive validation

Copyright



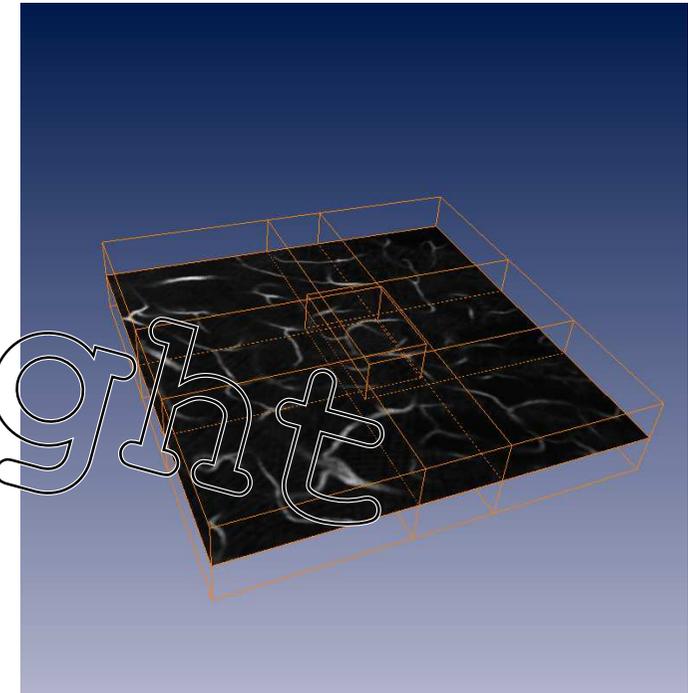
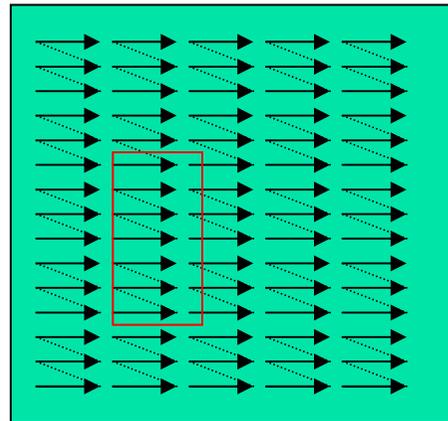
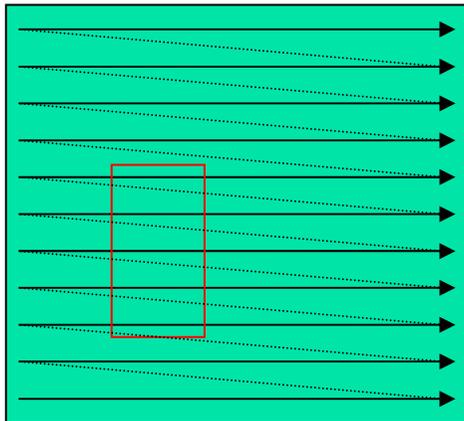
Data Processing Pipeline

- n Image Pre-Processing
 - n Block alignment ?
 - n Block merging
 - n Segmentation*
 - n Skeletonization/Distance map*
 - n Skeleton processing*
 - n Validation/Editing*
 - n Export/Analysis*
- Copyright*

*Operate on global image

Image Data

- n Merge to one large image
- n Data sets exceed main memory
- n Specialized storage scheme



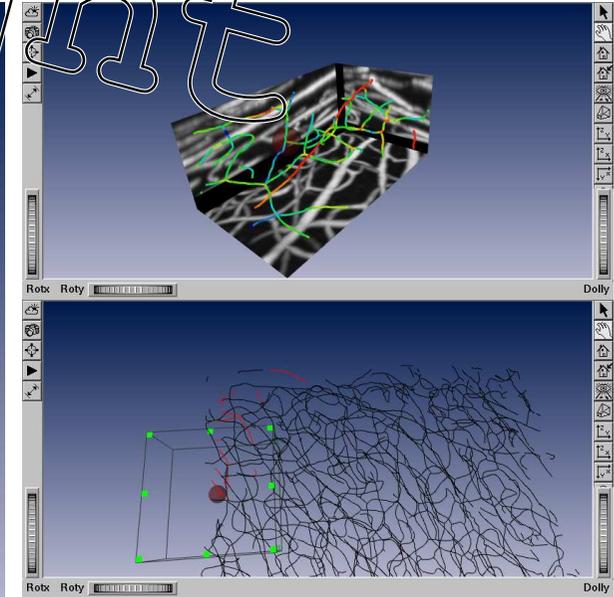
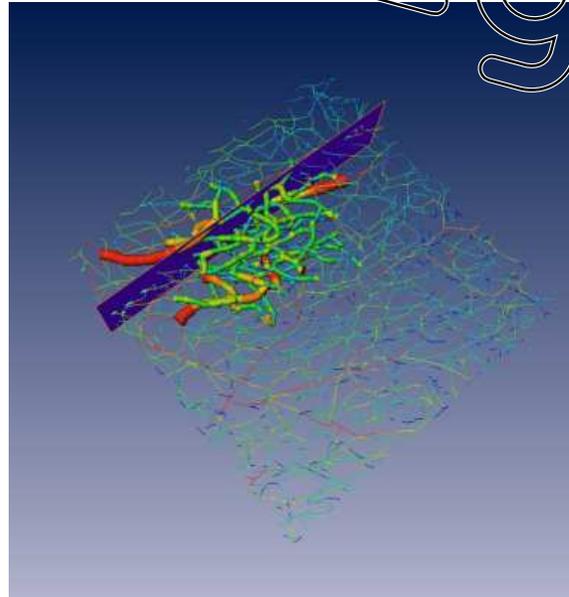
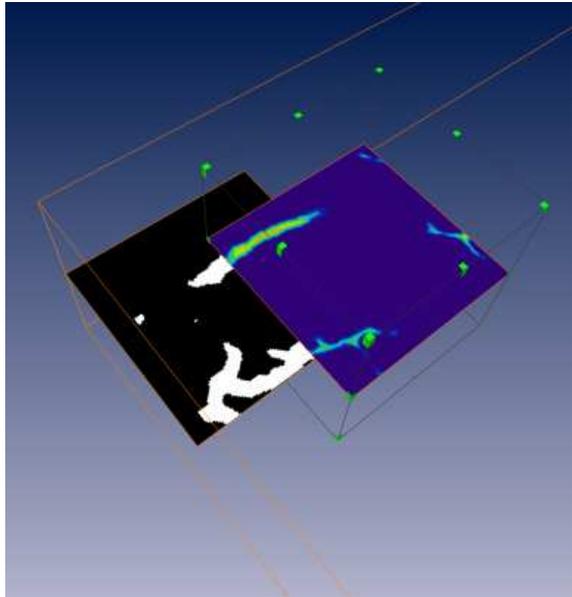
Processing

- n Specially adapted algorithms

- n Distance map

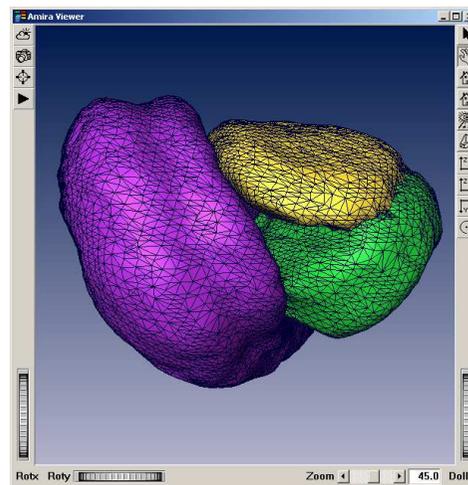
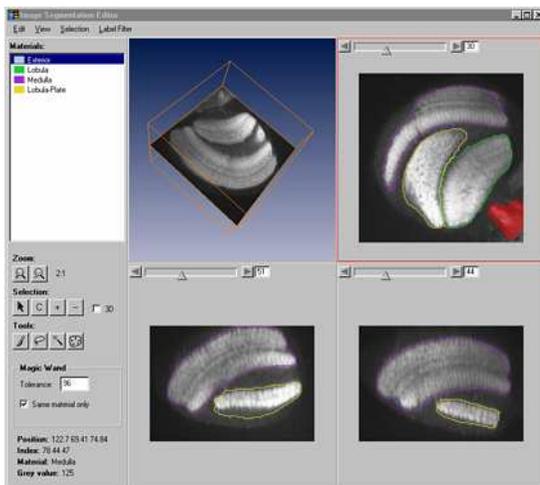
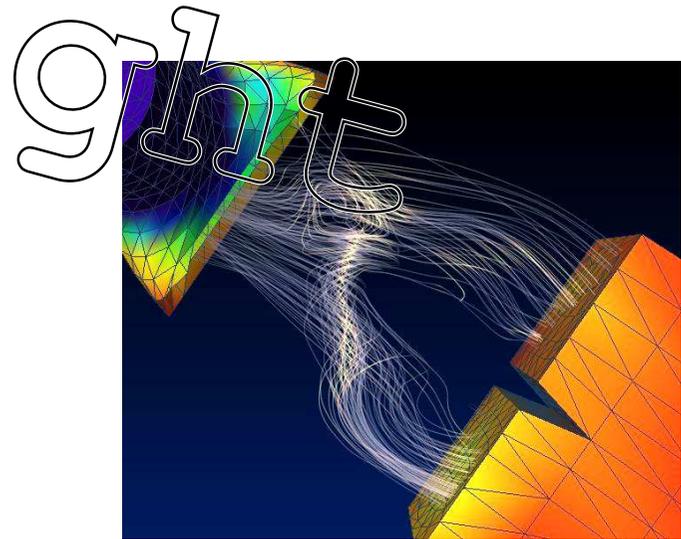
- n Center lines

- n Editing/Validating

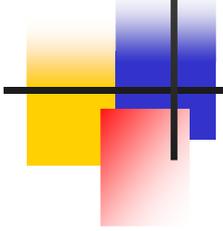


Integration into Amira®

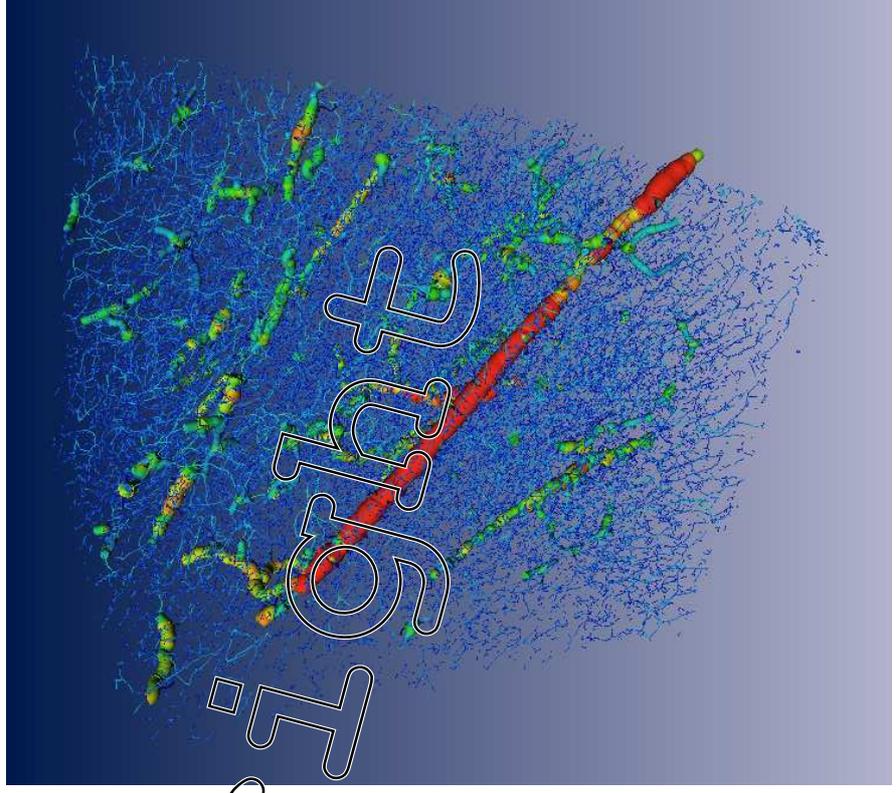
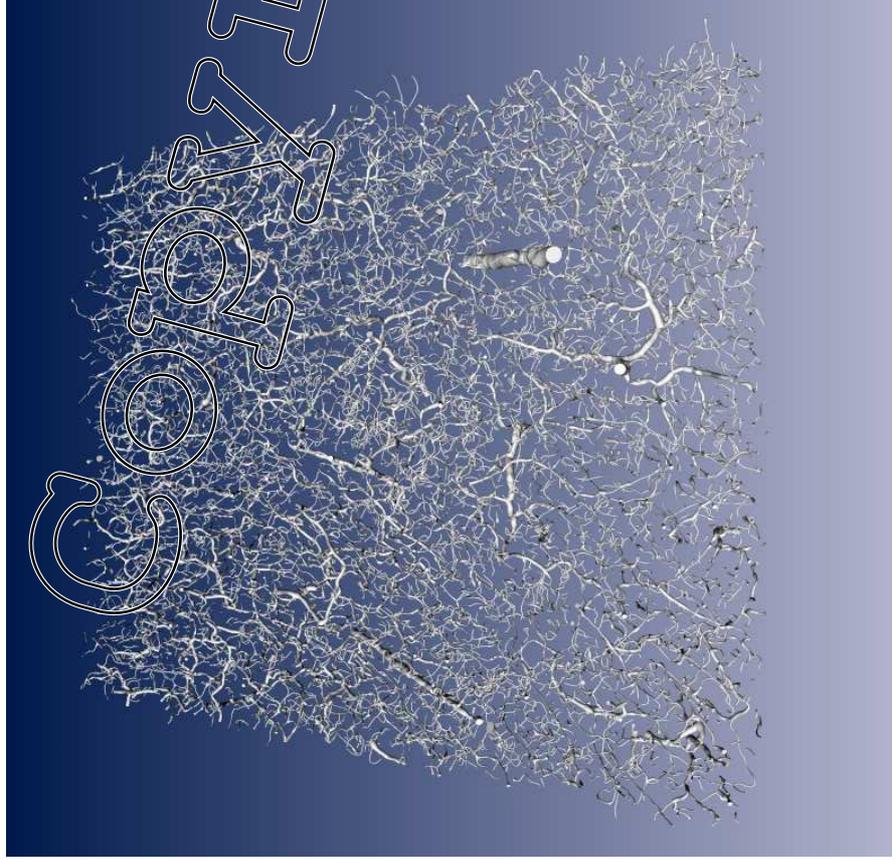
- n General-purpose 3D visualization system
- n 3D images
- n Segmentation
- n Surface/Grid generation
- n FEM/Grid visualization

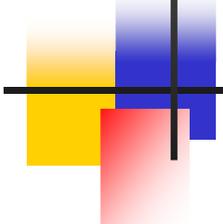


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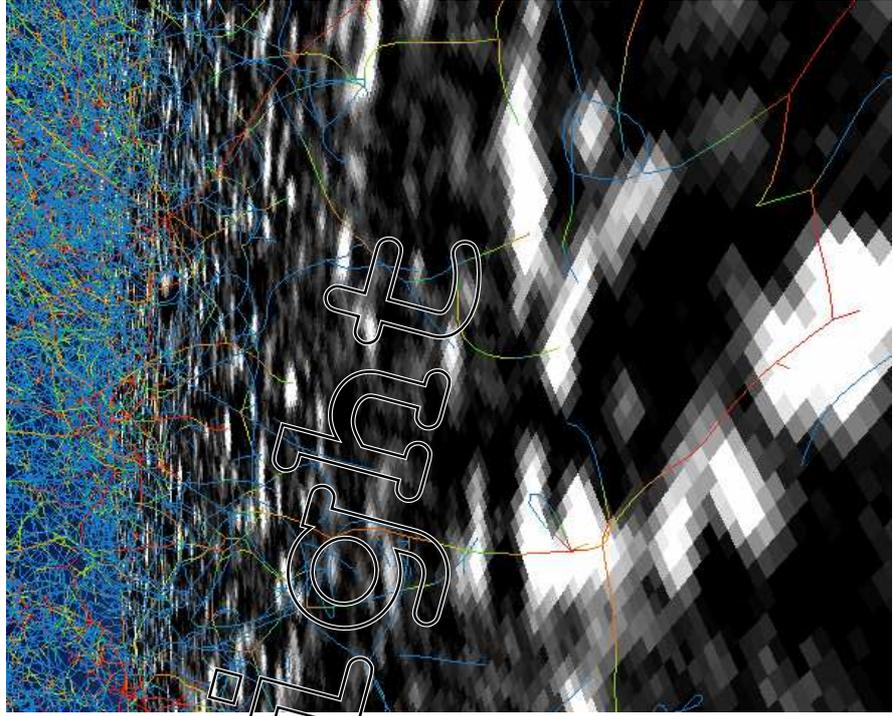
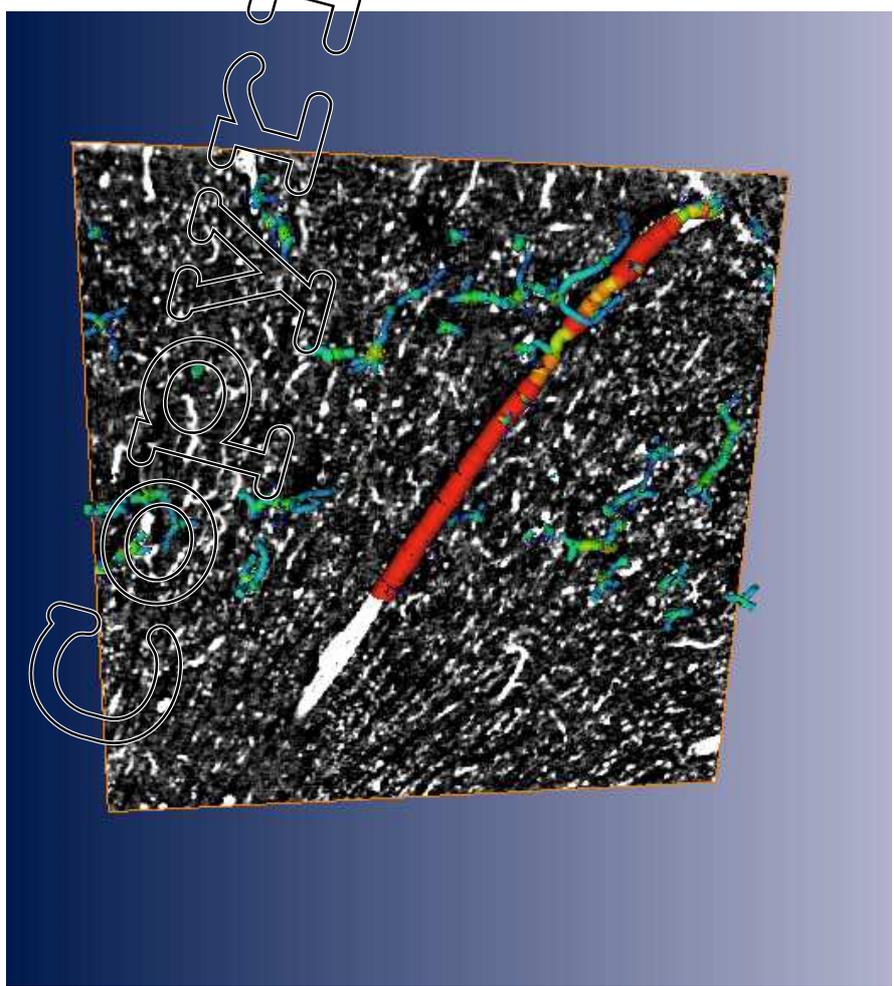


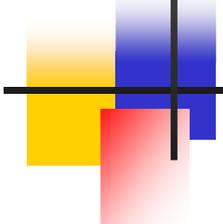
Gallery



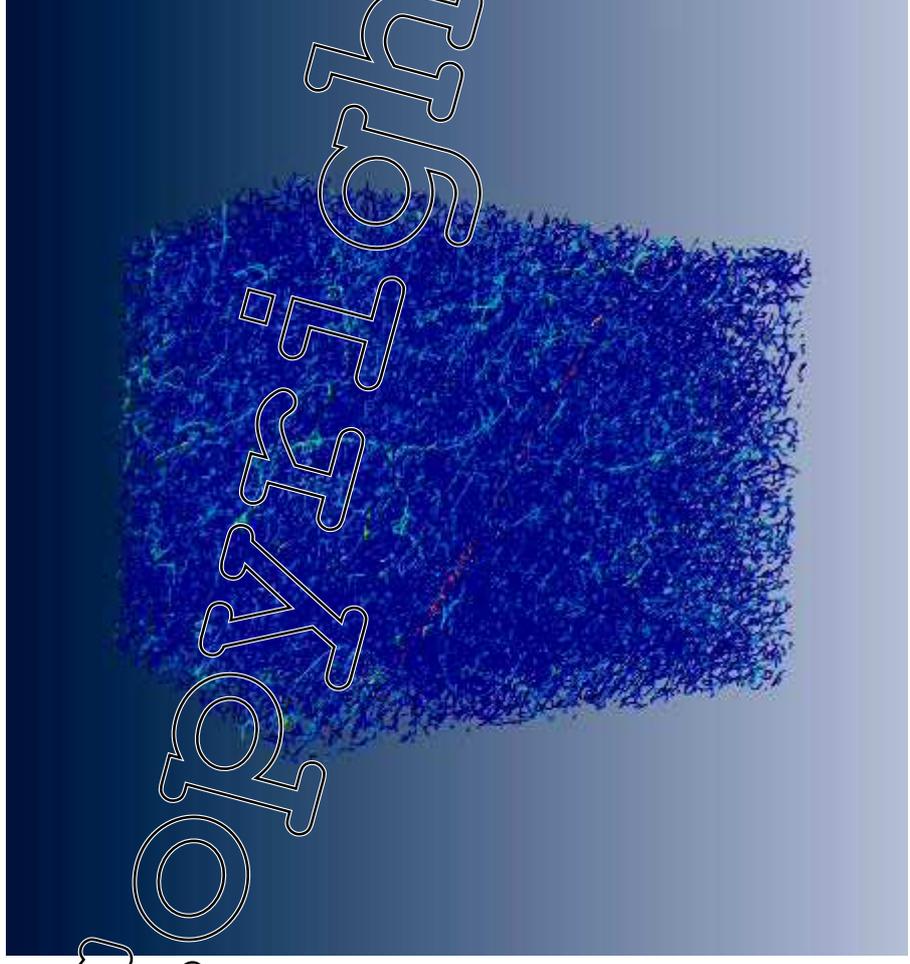


Gallery

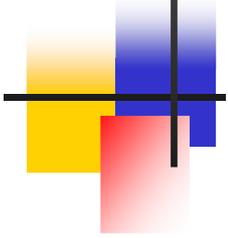




Gallery



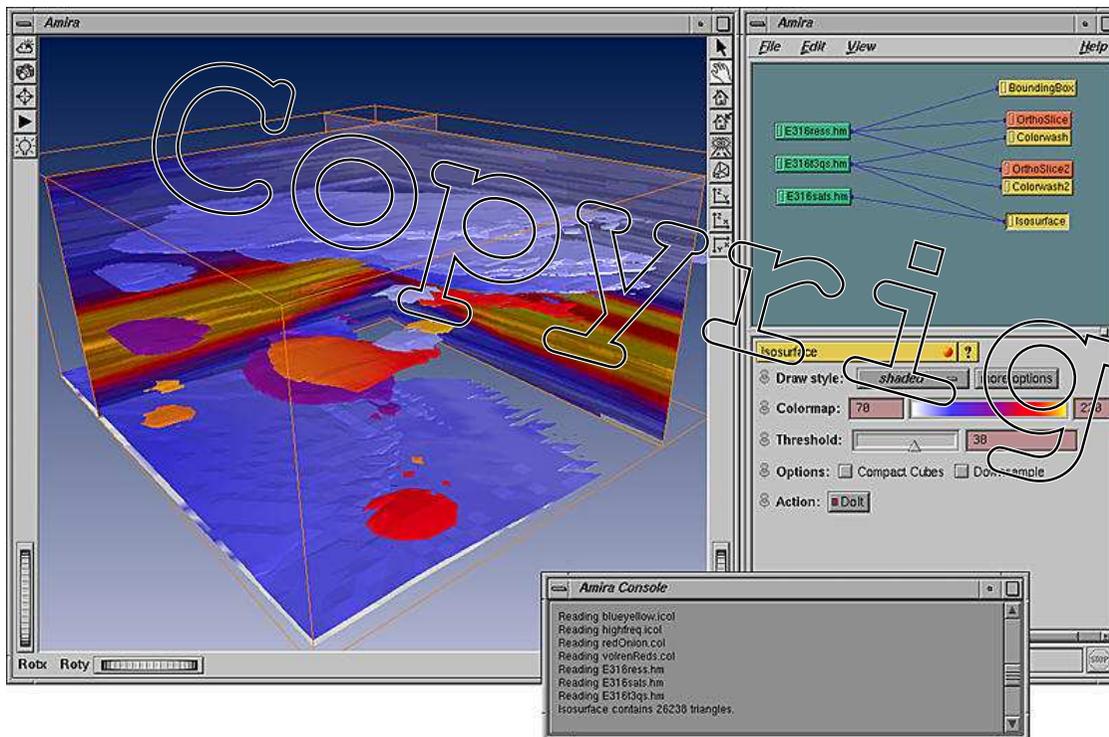
Copyright



Discussion

Copyright

Integration into amira



object pool
(data objects, modules)

working area
(gui elements, ports)

3D graphics window

console window

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