Analysis of Micro Vascular Networks

EEF Summer School on Massive Data Sets

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Project Overview

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

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

*Operate on global image
Image Data

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

- Specially adapted algorithms
  - Distance map
  - Center lines
  - Editing/Validating
Integration into Amira®

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

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Integration into amira

3D graphics window

console window

object pool
(data objects, modules)

working area
(gui elements, ports)

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