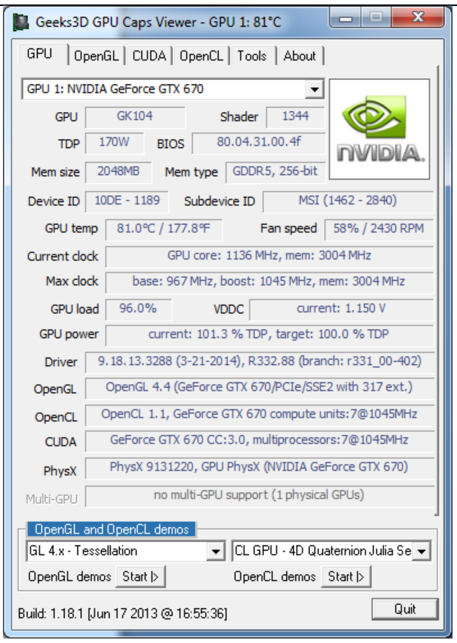
GigaVoxels

1. Configuration System : GPU / Cuda / OpenGL / System



GPU 1: NVIDIA GeForce GTX 670

GPU GK104 Shader 1344

TDP 170W BIOS 80.04.31.00.4f

Mem size 2048MB Mem type GDDR5, 256-bit

Device ID 10DE - 1189 Subdevice ID MSI (1462 - 2840)

GPU temp 81.0°C / 177.8°F Fan speed 58% / 2430 RPM

Current clock GPU core: 1136 MHz, mem: 3004 MHz

Max clock base: 967 MHz, boost: 1045 MHz, mem: 3004 MHz

GPU load 96.0% VDDC current: 1.150 V

GPU power current: 101.3 % TDP, target: 100.0 % TDP

Driver 9.18.13.3288 (3-21-2014), R332.88 (branch: r331_00-402)

OpenGL OpenGL 4.4 (GeForce GTX 670/PCIe/SSE2 with 317 ext.)

OpenCL OpenCL 1.1, GeForce GTX 670 compute units:7@1045MHz

CUDA GeForce GTX 670 CC:3.0, multiprocessors:7@1045MHz

PhysX PhysX 9131220, GPU PhysX (NVIDIA GeForce GTX 670)

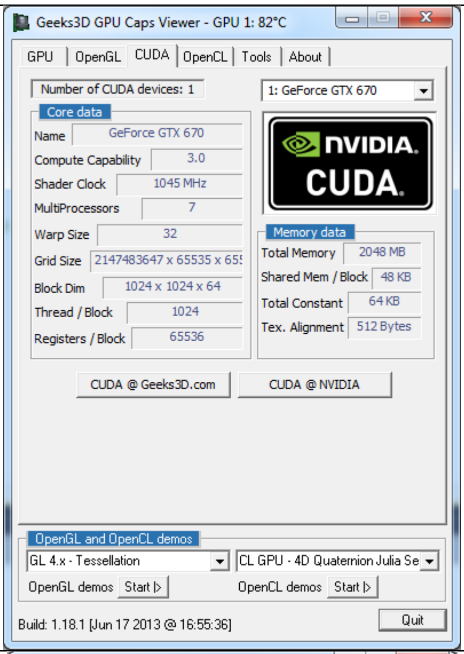
Multi-GPU no multi-GPU support (1 physical GPUs)

OpenGL and OpenCL demos

GL 4.x - Tessellation

CL GPU - 4D Quaternion Julia Se

Build: 1.18.1 [Jun 17 2013 @ 16:55:36]



Number of CUDA devices: 1

1: GeForce GTX 670

Core data

Name GeForce GTX 670

Compute Capability 3.0

Shader Clock 1045 MHz

MultiProcessors 7

Warp Size 32

Grid Size 2147483647 x 65535 x 65!

Block Dim 1024 x 1024 x 64

Thread / Block 1024

Registers / Block 65536

Memory data

Total Memory 2048 MB

Shared Mem / Block 48 KB

Total Constant 64 KB

Tex. Alignment 512 Bytes

OpenGL and OpenCL demos

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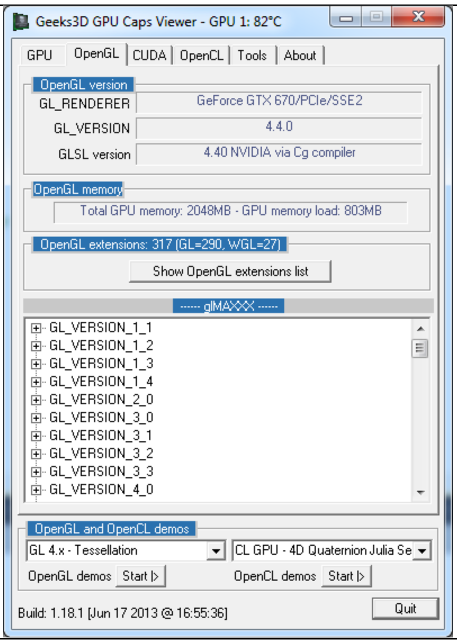
Build: 1.18.1 [Jun 17 2013 @ 16:55:36]


Geeks3D GPU Caps Viewer - GPU 1: 82°C
GPU
OpenGL
CUDA
OpenCL
Tools
About

OpenGL version

GL_RENDERER GeForce GTX 670/PCIe/SSE2

GL_VERSION 4.4.0

GLSL version 4.40 NVIDIA via Cg compiler

OpenGL memory

Total GPU memory: 2048MB - GPU memory load: 803MB

OpenGL extensions: 317 (GL=290, WGL=27)

Show OpenGL extensions list

------ glMAXXX ------

- GL_VERSION_1_1
- GL_VERSION_1_2
- GL_VERSION_1_3
- GL_VERSION_1_4
- GL_VERSION_2_0
- GL_VERSION_3_0
- GL_VERSION_3_1
- GL_VERSION_3_2
- GL_VERSION_3_3
- GL_VERSION_4_0

OpenGL and OpenCL demos

GL 4.x - Tessellation

CL GPU - 4D Quaternion Julia Se

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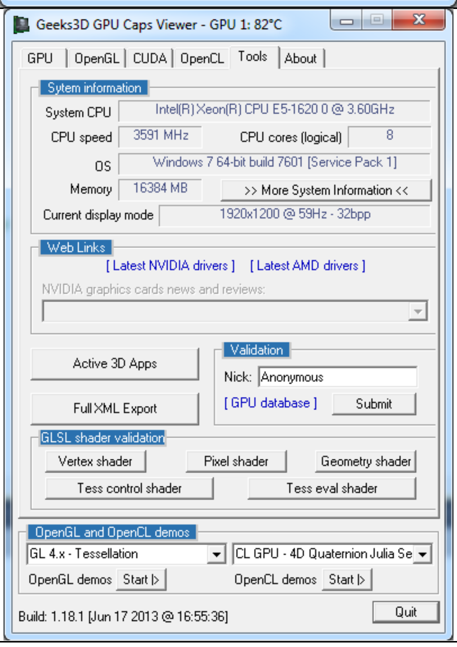


Sytem information

System CPU Intel(R) Xeon(R) CPU E5-1620 0 @ 3.60GHz

CPU speed 3591 MHz CPU cores (logical) 8

OS Windows 7 64-bit build 7601 [Service Pack 1]

Memory 16384 MB

Current display mode 1920x1200 @ 59Hz - 32bpp

Web Links

[Latest NVIDIA drivers]
[Latest AMD drivers]
NVIDIA graphics cards news and reviews:
Active 3D Apps
Full XML Export

Validation

Nick: Anonymous

GLSL shader validation

OpenGL and OpenCL demos

GL 4.x - Tessellation

CL GPU - 4D Quaternion Julia Se

Build: 1.18.1 [Jun 17 2013 @ 16:55:36]

Datasets

1. Aneurism – 256x256x256 – unsigned char (8 bits)

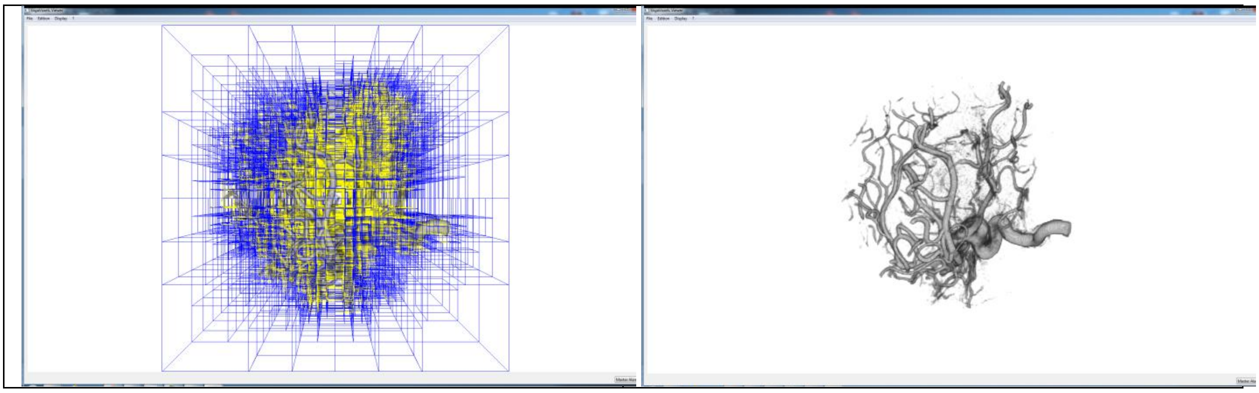
Rotational C-arm x-ray scan of the arteries of the right half of a human head. A contrast agent was injected into the blood and an aneurism is present.

Source : http://www.gris.uni-tuebingen.de/edu/areas/scivis/volren/datasets/datasets.html

Size / content / spacing : 256 x 256 x 256 - unsigned char (8 bits) – 1:1:1

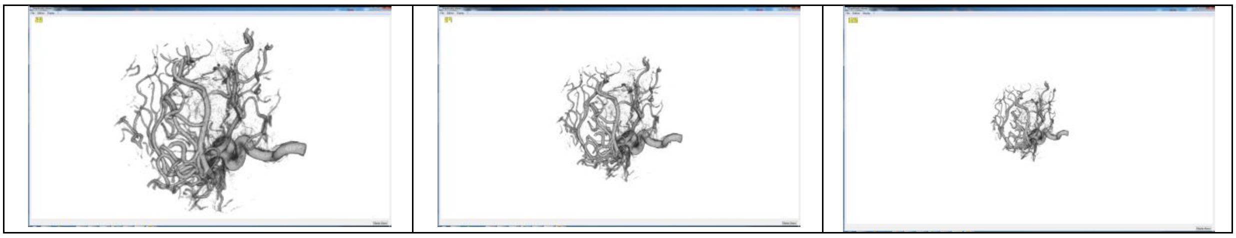
Window Size : 1900 x 1069

a) View of the octree



b) FPS

(left to right) : 29 - 57 – 126



Node Pool : 8 Mo

Data Pool : 256 Mo

2. Head Aneuyrism – 512x512x512 – unsigned short (16 bits)

Rotational C-arm x-ray scan of the arteries of the right half of a human head. A contrast agent was injected into the blood and an aneurism is present.

Source : http://www.gris.uni-tuebingen.de/edu/areas/scivis/volren/datasets/new.html

Size / content / spacing : 512 x 512 x 512 - unsigned short (16 bits) – 0.1953, 0.1953, 0.1953

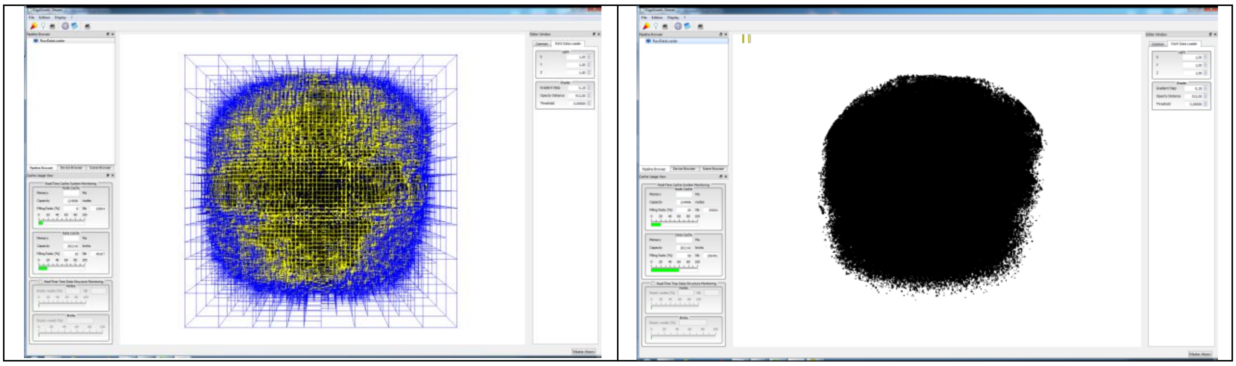
Note : 12 bits set

Rotational angiography scan of a head with an aneurysm. Only contrasted blood vessels are visible.

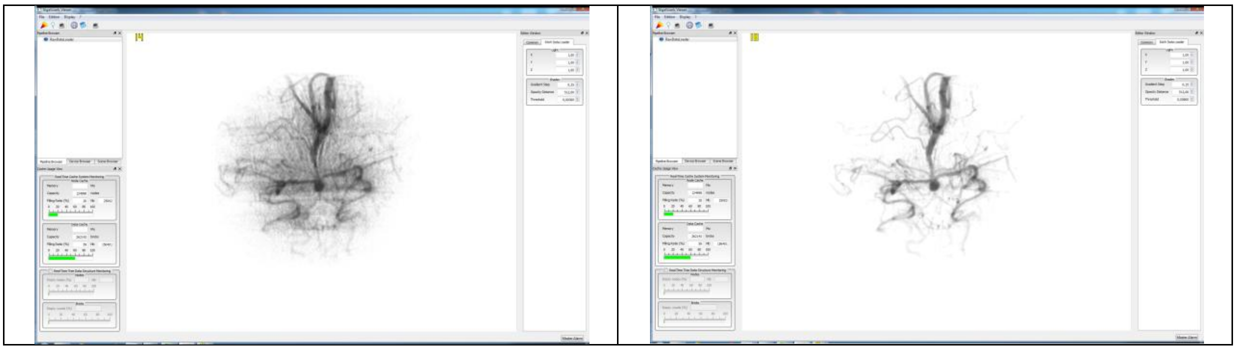
Window Size : 1900 x 1069

a) View of the octree

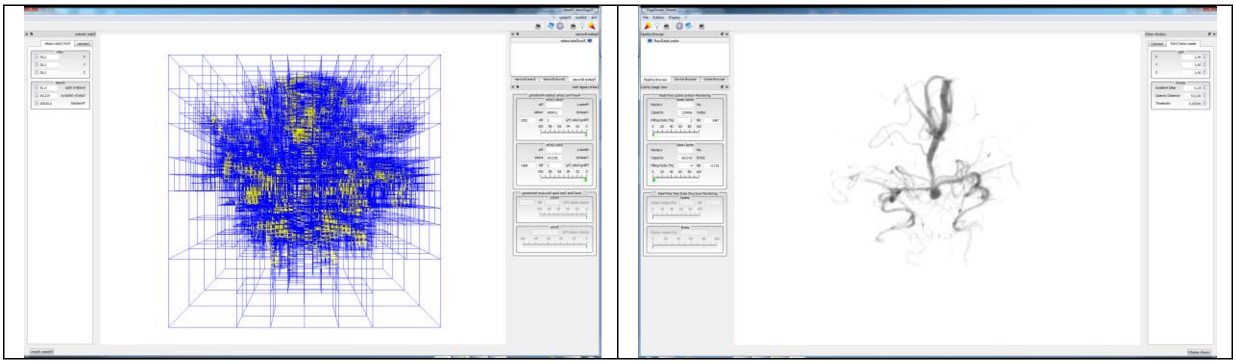
Without thresholding, we have bad octree due to noise.



We can use thresholding at run-time, but the associated octree remains the same. (more threshold on right)

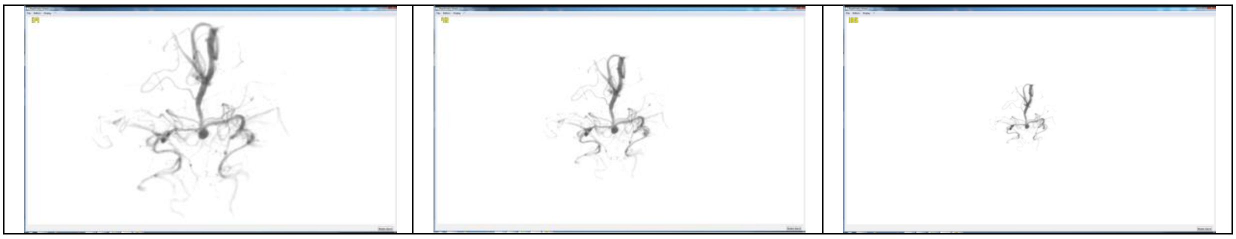


If we use thresholding during mipmap-pyramid construction, we have better octree. But it’s not interactive, it’s a long process done manually. It may be done automatically with an histogram ?



b) FPS

(left to right) : 34 - 72 – 189



Node Pool : 8 Mo

Data Pool : 512 Mo

3. Foot – 256x256x256 – unsigned char (8 bits)

Rotational C-arm x-ray scan of a human foot. Tissue and bone are present in the dataset.

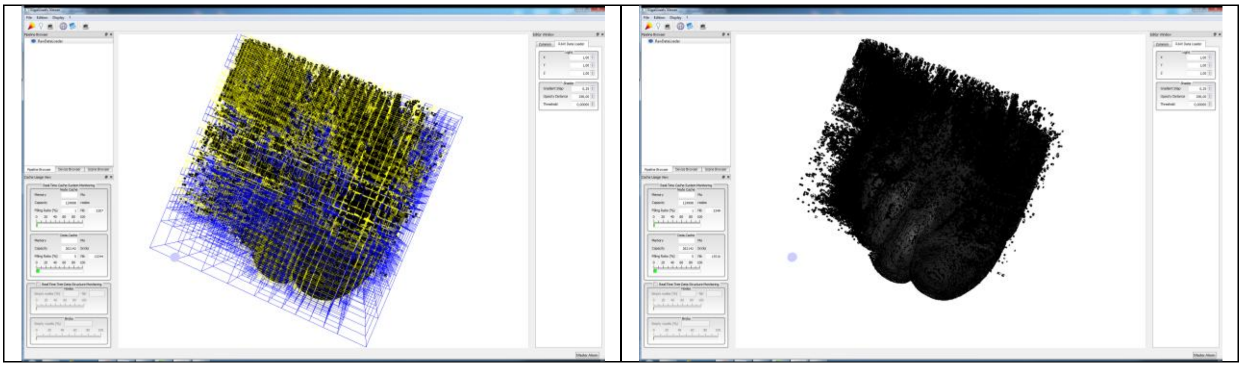
Source : http://www.gris.uni-tuebingen.de/edu/areas/scivis/volren/datasets/datasets.html

Size / content / spacing : 256 x 256 x 256 - unsigned char (8 bits) – 1:1:1

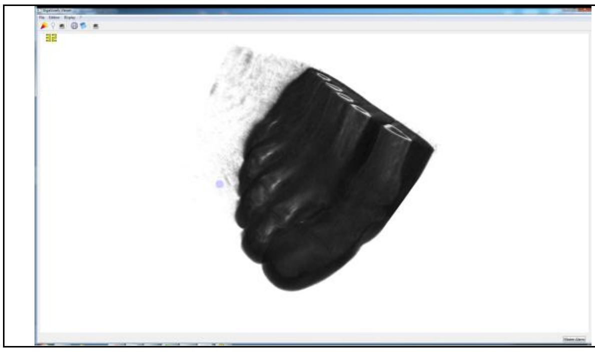
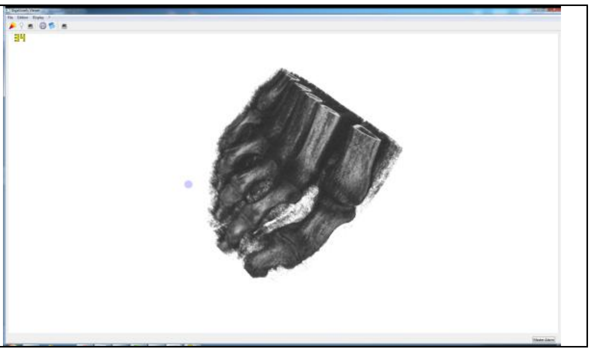
Window Size : 1900 x 1069

a) View of the octree

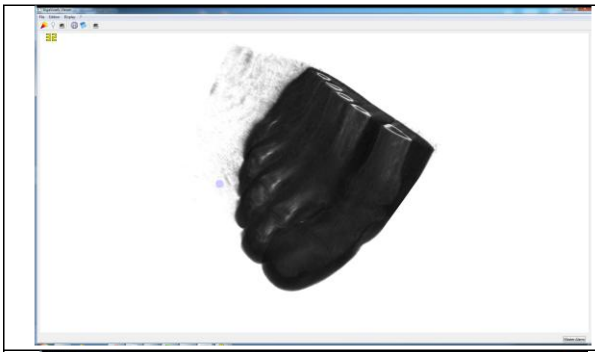
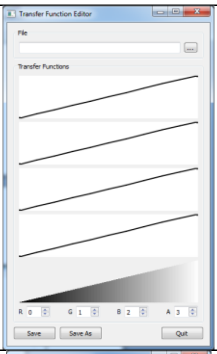
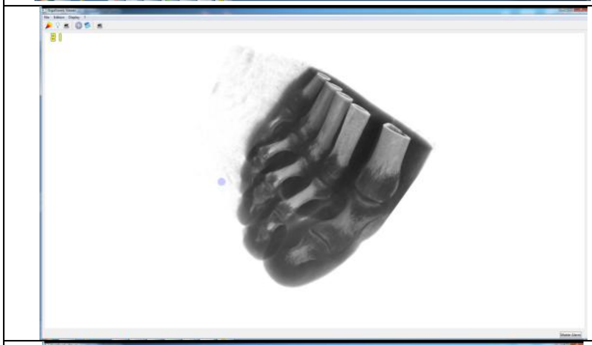
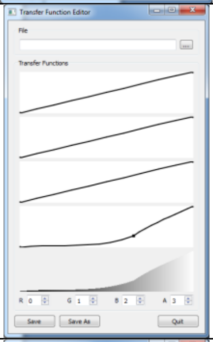
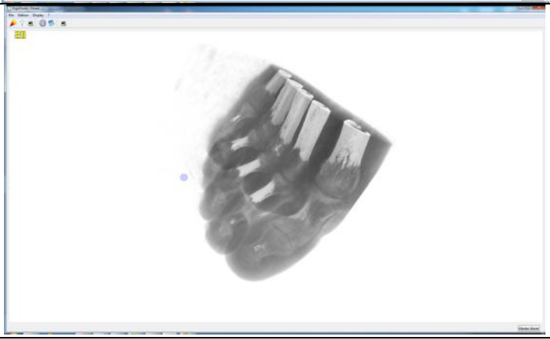
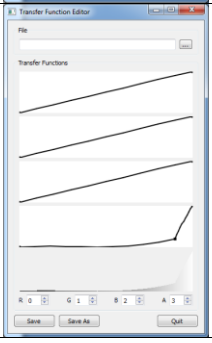
Without thresholding, we have bad octree due to noise.



We can use thresholding at run-time, but the associated octree remains the same. (more threshold on right)

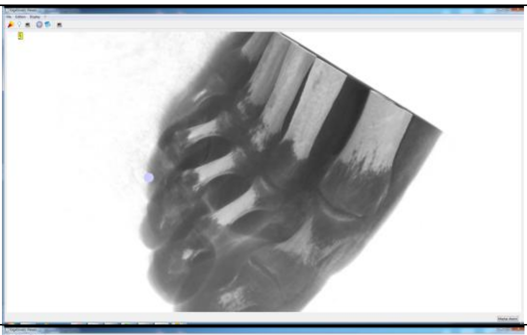
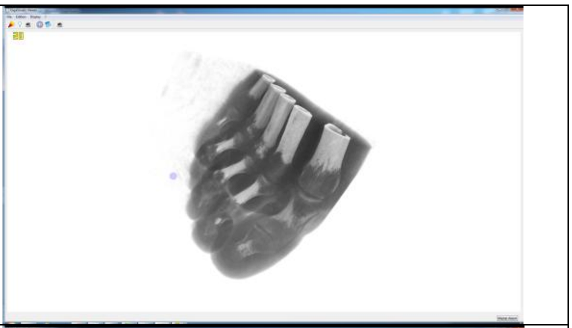
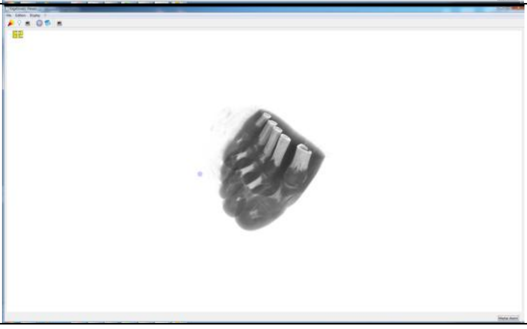
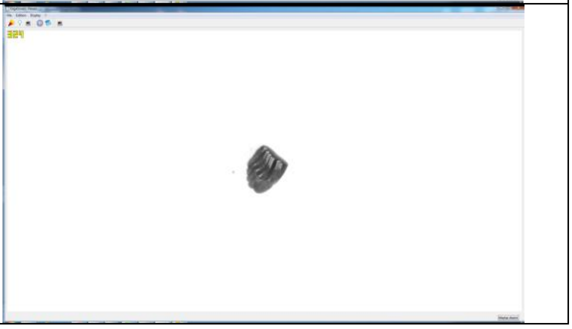
	

If we use alpha in transfer function in real-time, we can remove skin on bones.

	 Transfer Function Editor File Transfer Functions R 0 G 1 B 2 A 3 Save Save As Quit
	 Transfer Function Editor File Transfer Functions R 0 G 1 B 2 A 3 Save Save As Quit
	 Transfer Function Editor File Transfer Functions R 0 G 1 B 2 A 3 Save Save As Quit

c) FPS

(left to right) : 9 - 20 – 62 - 324

Node Pool : 8 Mo

Data Pool : 256 Mo

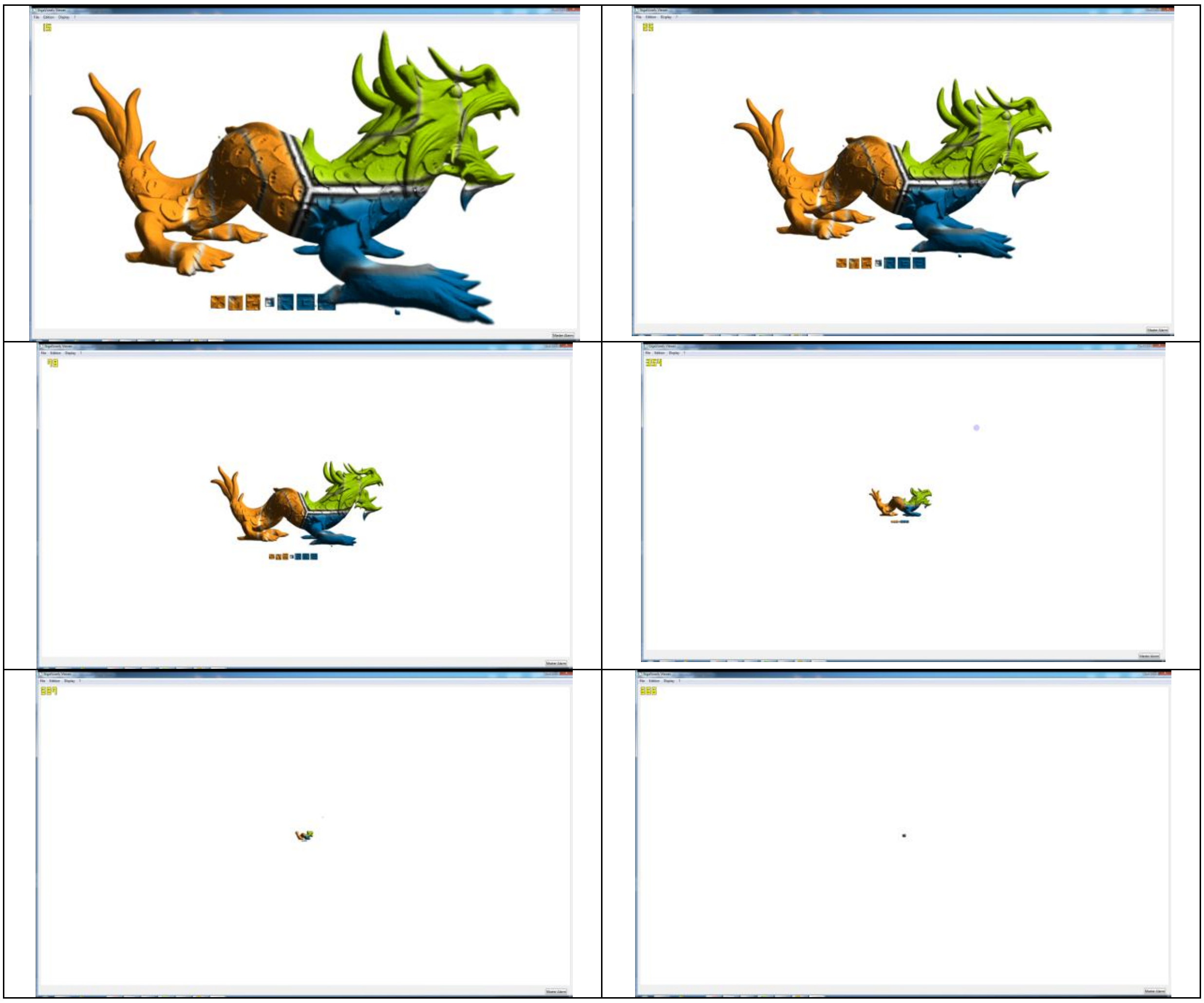
Exemple 3D

512x512x512 - “unsigned char 4” : rgb+a (4 components color)

Normals are computed at real-time for shading (appearence) by central finite differences (6 neighbors)

Window Size : 1900 x 1069

FPS : 15 – 25 – 79 – 354 – 597 – 666 (as distance to viewer increase)

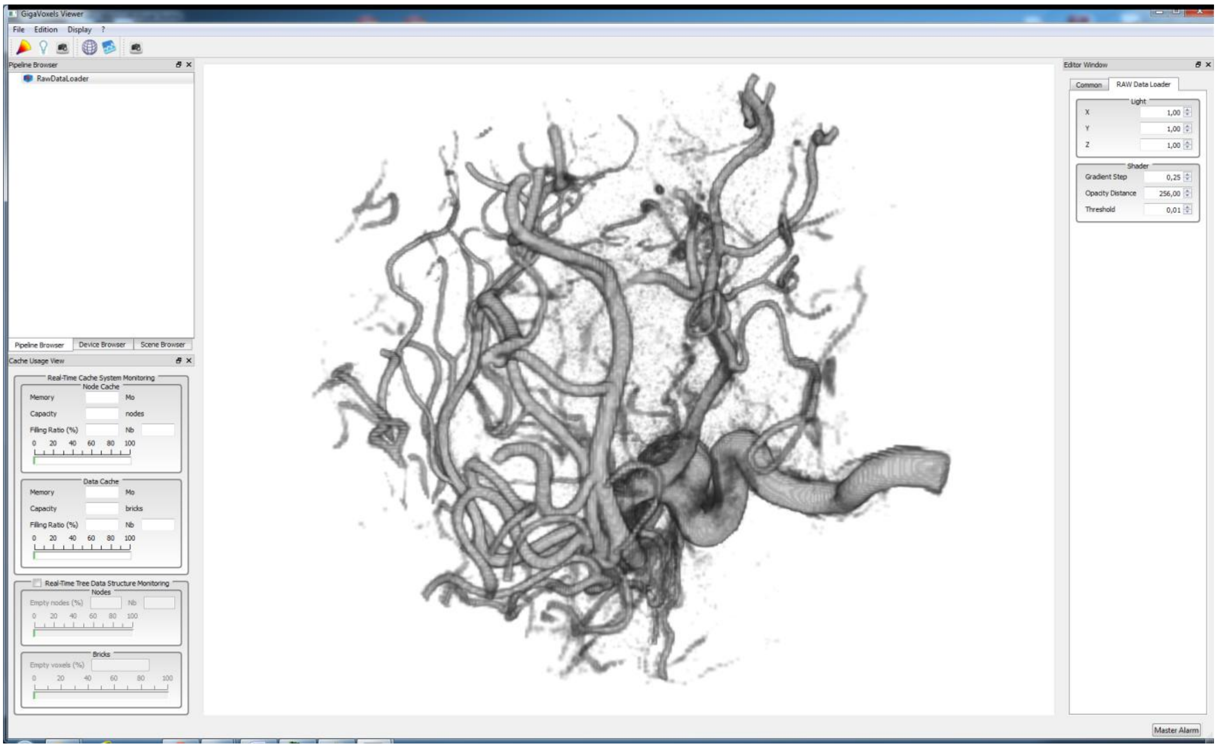


Node Pool : 8 Mo (cache de neouds spatiaux)

Data Pool : 256 Mo (cache de données : “voxels”)

Tools

1. Viewer – Customizable editor



Light

X 1,00

Y 1,00

Z 1,00

Shader

Gradient Step 0,25

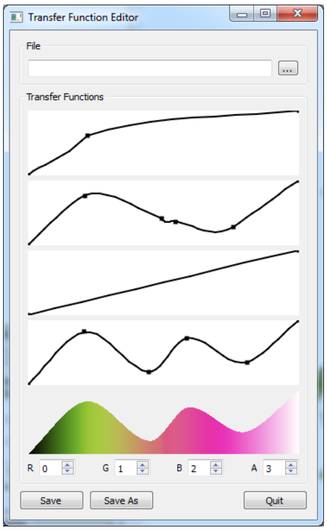
Opacity Distance 256,00

Threshold 0,01

2. Customizable Transfer Function Editor

RGB + A

But customizable



R 0 G 1 B 2 A 3

Features

1. Producers

Only N3-tree (octrees, etc) => same size and same spacing

2. Renderer

Other

1. Limitations

Only N3-tree (octrees, etc) => same size and same spacing