

GPU-based Volume Rendering plan

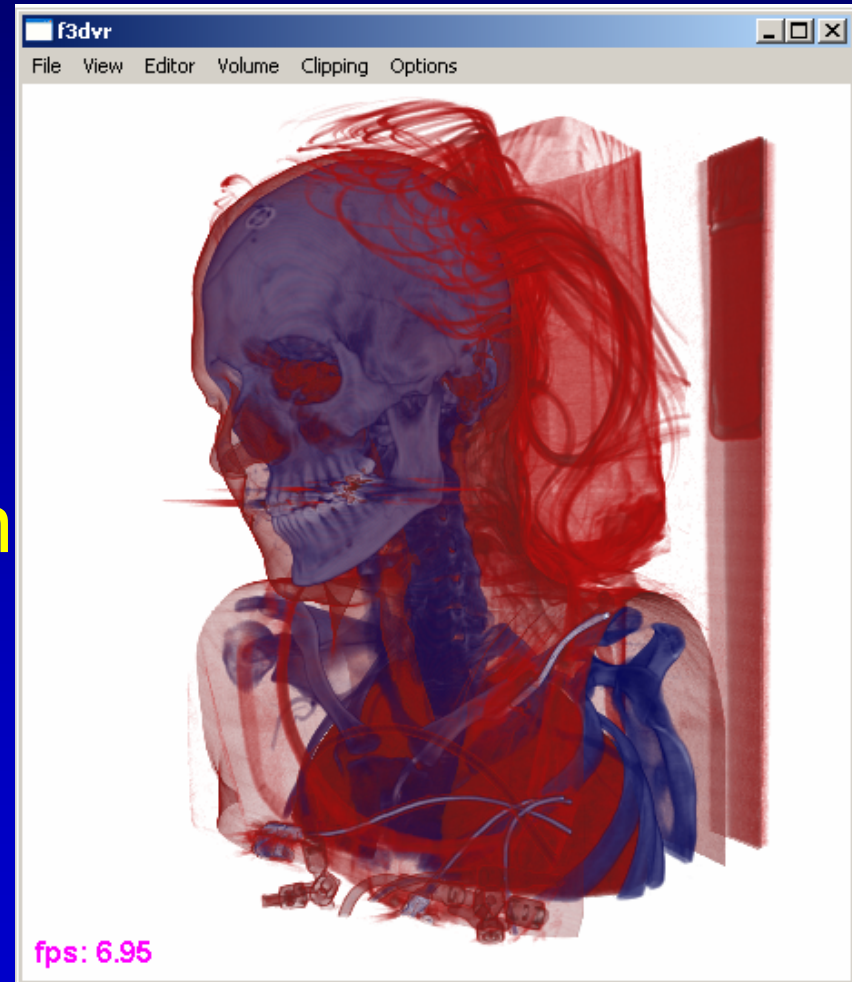
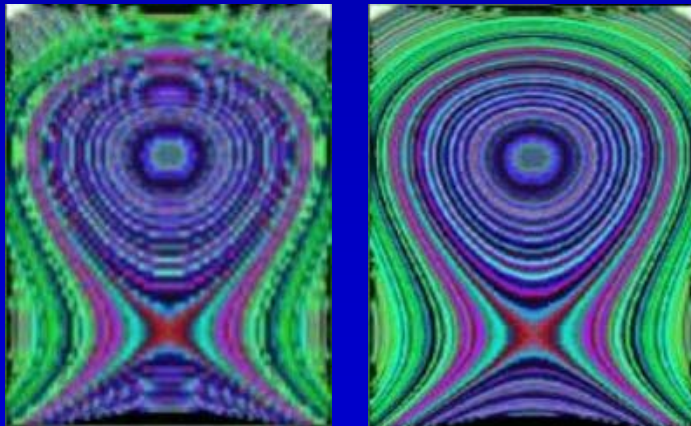
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Outline

- Previous work
- Actual work
- Future work
 - requirements
 - design
- New technologies

Previous work - f3dvr

- 2d, 3d textures
- shading
- max/min IP
- clip planes
- pre,post - classification

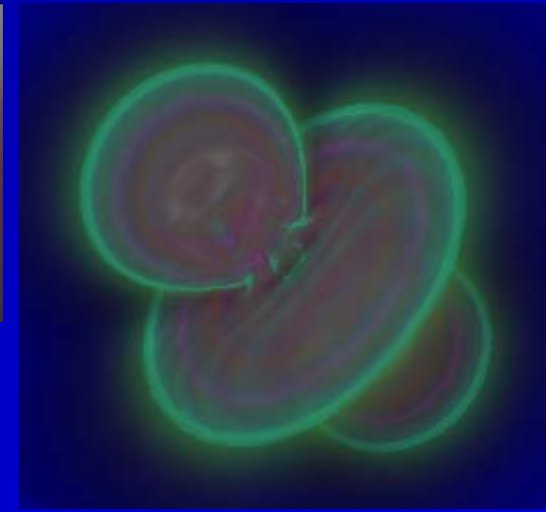
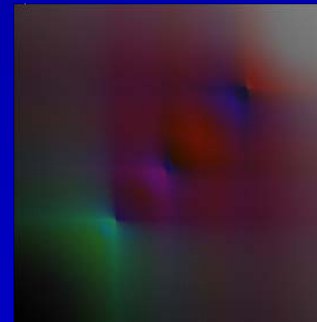
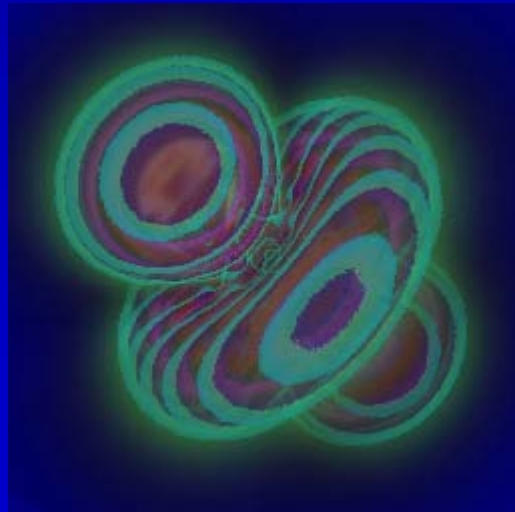
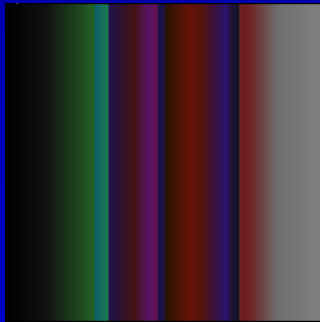
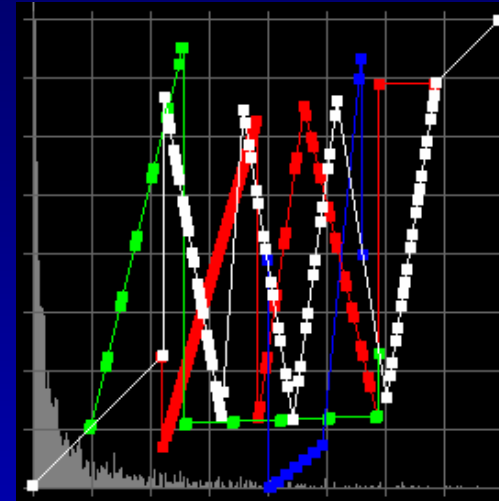


Actual work

- read / write TF from / to file
- pan on middle mouse button
- auto save settings (win position & size, draw mode ...)
- eliminate some known bugs
- pre-integration classification
- ray-casting draw mode

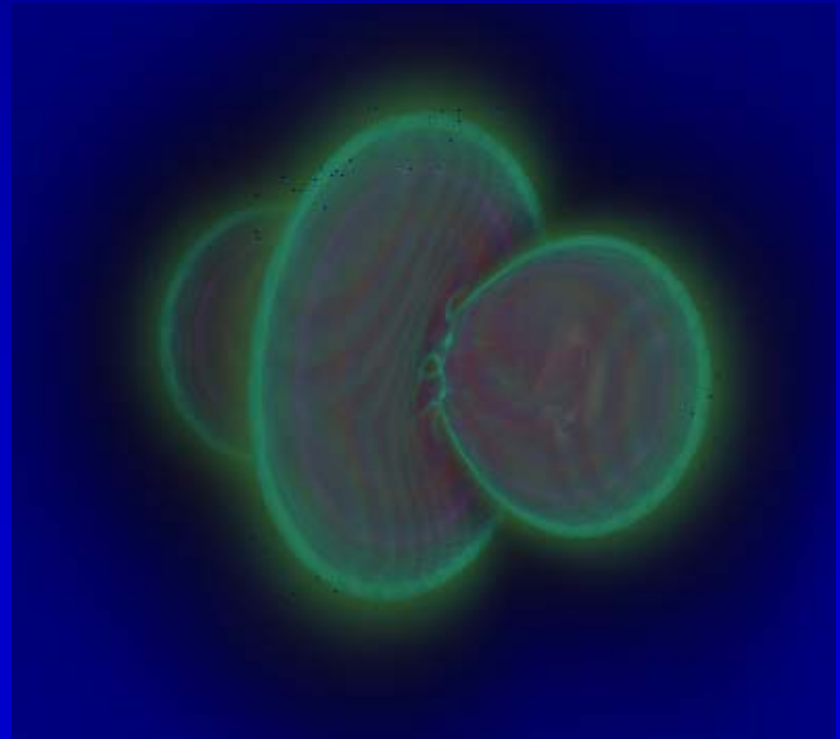
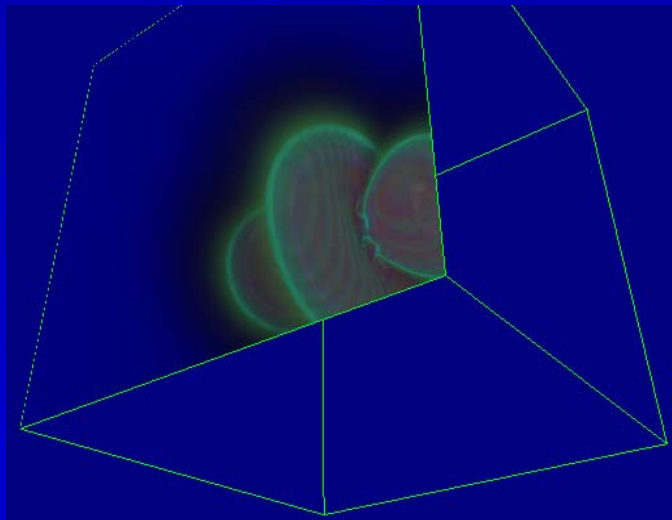
Pre integration

- slab by slab rendering
- pre processing:
pre integration of all possible combinations



Ray-casting

- requirements – shader model 3.0
- one pass rendering
- both classification used
- early ray termination
- empty space skipping



Future of f3dvr

- f3dvr will be closed soon
- possible extension by new features
- for quick testing
- source code:
<http://gerlach.viskom.oeaw.ac.at/websvn/>

Future work

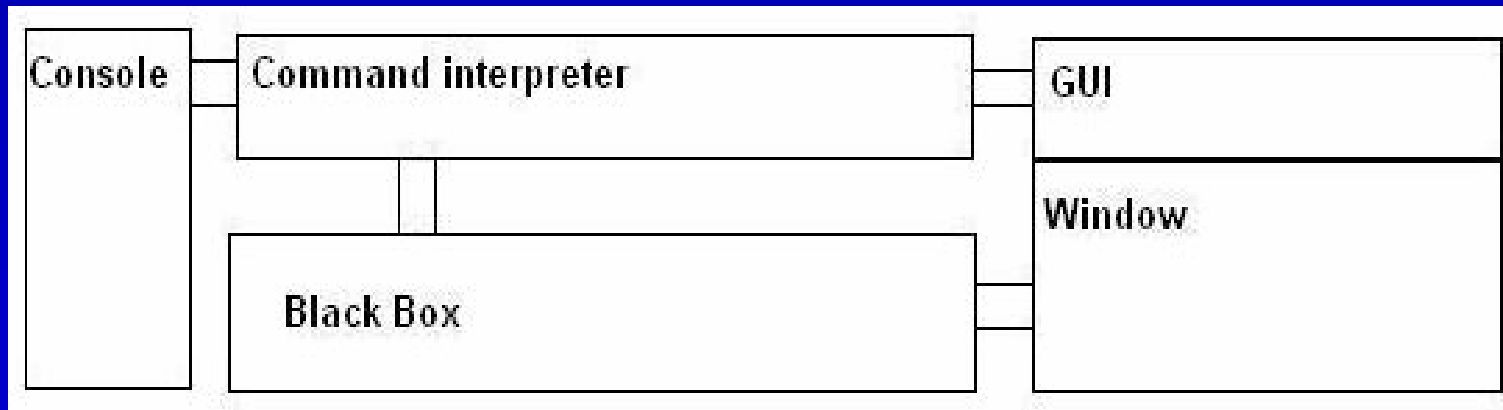
- new project for volume rendering by using GPU
- libraries package for easy usage
- progressive development
- name not decided yet

Requirements

- controlled via console by commands (rotx 45°, loaddata "file" ...)
- maximal usage of GPU (not only for rendering)
- easy extendible by new techniques and technologies
- system independent (Linux, Windows)
- common window (extendible by suitable GUI)
- big datasets
- ...

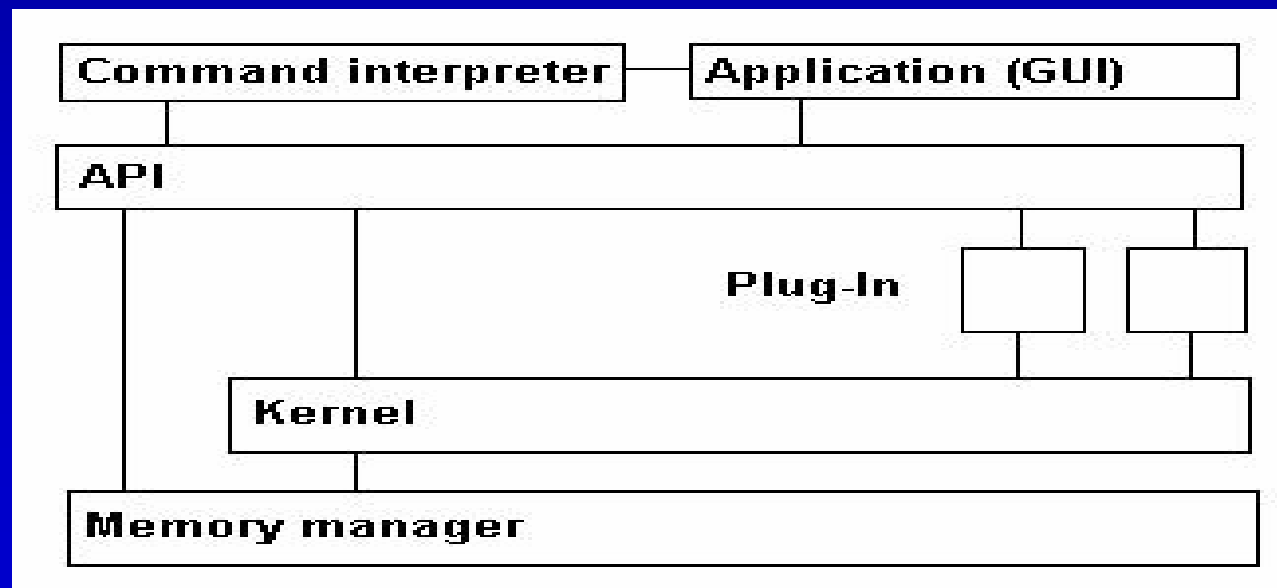
Design – basic idea

- command interpreter
- input from console - commands
- black box – rendering & computing
- GUI – command interpreter or API



Design – architecture

- command interpreter – application
- memory manager – data representation
- plug-in manager – rendering/editing modes
- kernel – based on GPU



New technologies

- Actual version of GPU (7xxx, X1xxx)
- Shader model 3.0, DX9.0c, OpenGL 2.0 (GLSL)
- SLI, CrossFire
- TurboCache, HyperMemory
- 16/32 bit floating point format
- 64 bit texture filtering & blending

Thank you
for your attention