VolumeRenderer

Powered By Tang Boyi, Wang Teng and Xu Xuejun.

Introduction

Volume Renderer is a volume rendering program based on VTK, CTK and Qt.

File support

- slc formate

Renderer Support(Hot switch)

- vtkSlicerGPURayCastVolumeMapper(from Slicer https://www.slicer.org/)
- vtkGPUVolumeRayCastMapper
- vtkSmartVolumeMapper (Default. Recommended. Microsoft Remote Desktop can downgrade OpenGL to 1.1 and it can switch to CPU)

Transfer Function Interaction

- Drag a point
- Delete a point
- Add a point
- Change RGB color of a demarcation point
- Digital setting mode supported

Framerate Display

- When the FPS is greater than 60 ,the color is black; otherwise red.

Others

Advanced interpolation, shade and material settings.

Installation(Optional)

Item	Version	Remark
VTK	8.0.1	
Qt	5.12.3	MSVC 2017
CMake	3.14.4	GUI

CMake settings for compiling VTK

```
set(VTK_DIR "C:/Users/chwangteng/Downloads/vtkqt8.0.1/vtk-v8.0.1-build" CACHE PATH "VTK
directory")
set(QT_QMAKE_EXECUTABLE "C:/Qt/Qt5.12.3/5.12.3/msvc2017_64/bin/qmake.exe" CACHE PATH "Qt
qmake.exe")
set(CMAKE_PREFIX_PATH "C:/Qt/Qt5.12.3/5.12.3/msvc2017_64" CACHE PATH "Qt directory")
set(VTK_QT_VERSION 5 CACHE STRING "Qt version")
set(VTK_NO_LIBRARY_VERSION ON CACHE BOOL "VTK_NO_LIBRARY_VERSION")
set(VTK_Group_Qt ON CACHE BOOL "VTK_Group_Qt")
set(Module_vtkGUISupportQt ON CACHE BOOL "Module_vtkGUISupportQt")
set(Module_vtkGUISupportQtOpenGL ON CACHE BOOL "Module_vtkGUISupportQtOpenGL")
```

```
set(Module_vtkRenderingQt ON CACHE BOOL "Module_vtkRenderingQt")
set(BUILD_TESTING OFF CACHE BOOL "BUILD_TESTING")
set(VTK_RENDERING_BACKEND_DEFAULT "OpenGL")
```

CMake settings for compiling the project volume-renderer/VolumeRenderer/CMakeLists.txt

```
set(VTK_DIR "C:/Users/chwangteng/Downloads/vtkqt8.0.1/vtk-v8.0.1-build" CACHE PATH "VTK
directory")
set(QT_QMAKE_EXECUTABLE "C:/Qt/Qt5.12.3/5.12.3/msvc2017_64/bin/qmake.exe" CACHE PATH "Qt
qmake.exe")
set(CMAKE_PREFIX_PATH "C:/Qt/Qt5.12.3/5.12.3/msvc2017_64" CACHE PATH "Qt directory")
```

RUN

1. Open executable/VolumeRenderer/VolumeRenderer.exe in Windows(64bit).
2. Click "Open" and select a slc file(vm_foot.slc).
3. Have fun.

TODO

- Bug fix
- Performance improvement

References

VTK安装 win10+VS2017+VTK8.1.2+QT5.12编译安装
VTK8.1 在 Qt5.9 环境下的配置、编译和安装
VTK/Examples/Cxx/VolumeRendering/SmartVolumeMapper
VTK/Examples/Cxx/Utilities/FrameRate
vtkCommand Class Reference
QVTKWidget Class Reference
ctkTransferFunctionWidget
vtkVolumeProperty Class Reference