

Volume Slice Viewer

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In this project, we are prompted to implement an OpenGL application that allows the user to slice different volumes of CT scans for visualization purposes.

1 Introduction

Figure 1 shows a screenshot of the visualization interface of the volume slicer, which represents the user's main point of view of the CT scan loaded into the GPU.

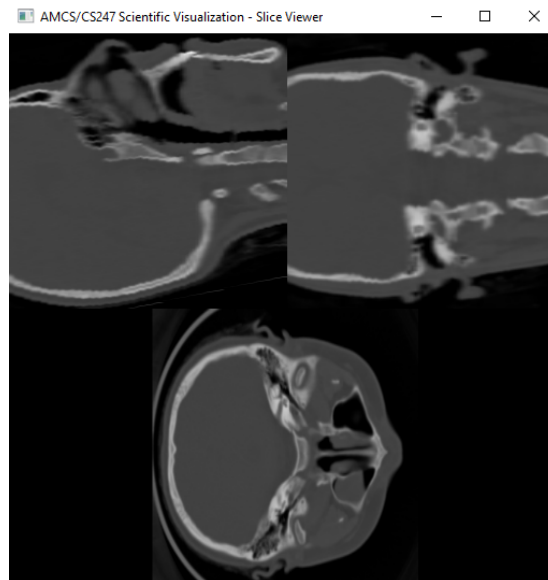
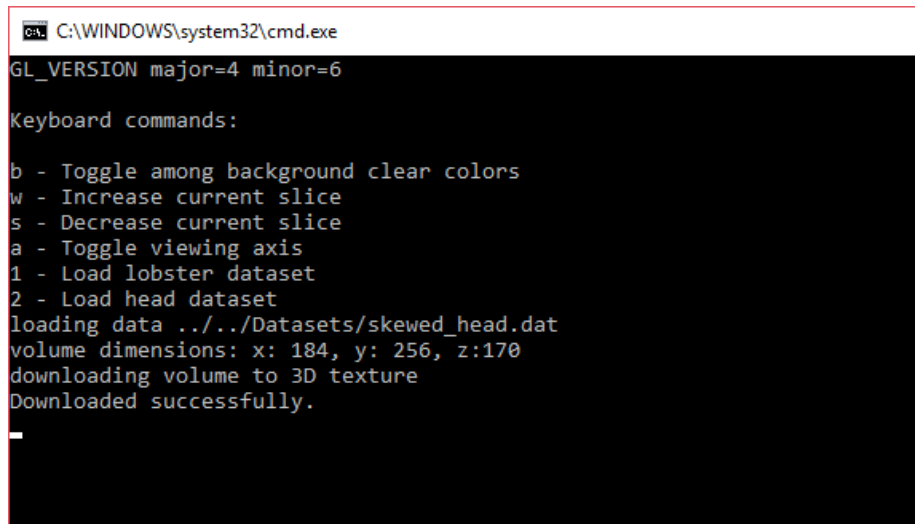


Figure 1: Main viewer showing 4 different slices of a brain CT scan

After loading the desired *.dat* file, the volume slicer application shows three slices of the CT scan.

2 Usage

Figure 2 shows a screenshot of the command line terminal when running the program. It provides the ability to toggle through the different three slices illustrated in Figure 1 using the *a* key on the keyboard. The user can also adjust the slicing position along a specific axis using the *w* and *s* keys after toggling to the desired plane.



```
C:\WINDOWS\system32\cmd.exe
GL_VERSION major=4 minor=6

Keyboard commands:

b - Toggle among background clear colors
w - Increase current slice
s - Decrease current slice
a - Toggle viewing axis
1 - Load lobster dataset
2 - Load head dataset
loading data ../../Datasets/skewed_head.dat
volume dimensions: x: 184, y: 256, z:170
downloading volume to 3D texture
Downloaded successfully.
```

Figure 2: Keyboard shortcuts and navigation

3 Slicing Axes

The top left image in Figure 1 represents the *YZ*-plane slice cutting along the *X*-axis, the top right image represents the *XZ*-plane slice cutting along the *Y*-axis, and the bottom image represents the *XY*-plane slice cutting along the *Z*-axis.