Report for DVR method.

1. The visualization of the mummy head was done in Python by rewrite the given file for the volume rendering and maximum intensity projection method. A GUI was implemented using Tkinteract library, which contains two button, Save and Quit. When executing the two python script(vol_ren.py and vol_mip.py), the results are as given:

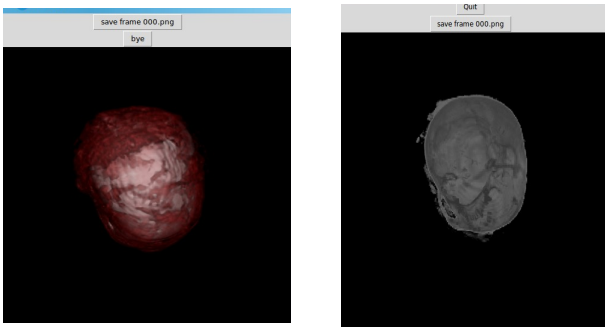

Figure 1: the GUI of vol_ren.py(left) and vol_mip.py(right).

The GUI have two button which can save the picture and quit when clicking. It also has the rendering window which displays the image and also support interaction using mouse.

2.

For volume rendering method:

Test 1: set the color to red for the skin part of mummy head:

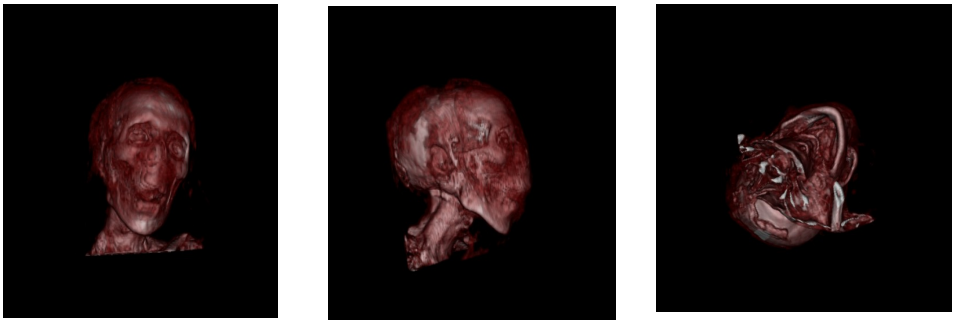

Figure2: The visualization of mummy head from front, side and bottom.

Test 2: set the opacity of the density below 100 to be 0 to visualize the bone:

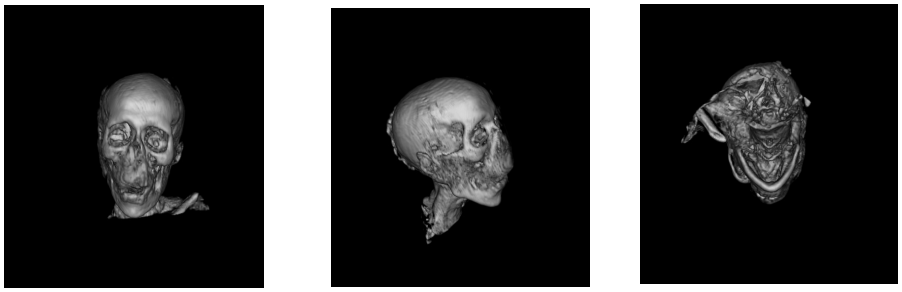

Figure3: The visualization of mummy skull from front, side and bottom.

For the maximum intensity projection method
Test1: Change the color of visualization to green:

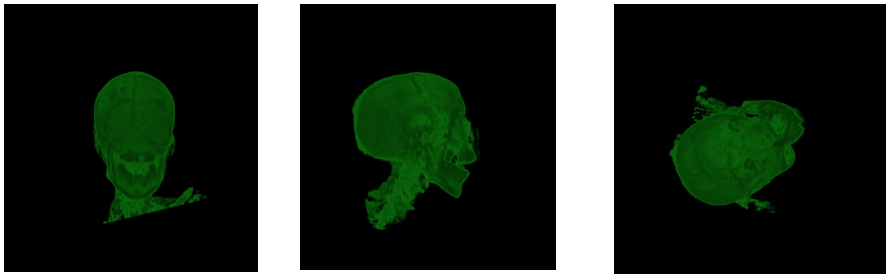

Figure4: The maximum intensity projection of mummy head from front, side and bottom.

Test 2: Set the skin to have the highest opacity

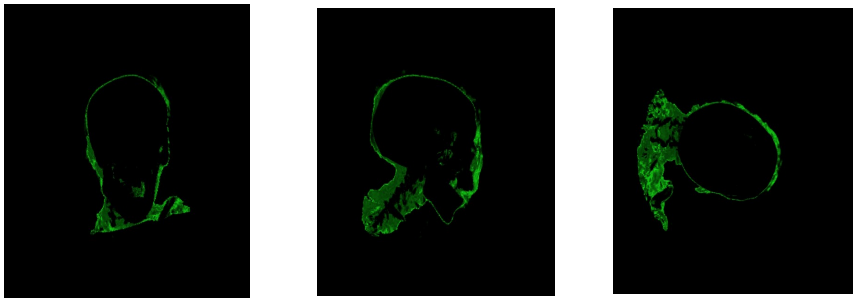

Figure5: The maximum intensity projection of mummy head from front, side and bottom.

3.
vtkVolumeRayCastMapper:
This is a slow but accurate mapper for rendering volumes. It can takes the density data as an input and maps the color based on the given sample distance and the composite function, which indicates the rule to calculate the samples.

VtkOutlineFilter:
This filter can takes the dataset as input and output the boundary region of the data. This filter can be used to add a bounding box to the area of visualization. However, in the given code the filter has not been used since it is not working well together with ray casting algorithm.

VtkWindowToImageFilter:
This filter can takes the rendering window and use it as input to the following imaging pipeline, the window can be read as RGB pixels. This filter is useful to save image in this program.