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CS3200 - Assignment 8 Report
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Question 1

In order to actually see my working directory, open “Question1_View.pvsm” in Paraview. More information to open it can be found in the “README” file attached.

After following the instructions provided in Question 1, I was able to achieve the expected view results in paraview. Here are my results:

Figure 1 - Working Directory View

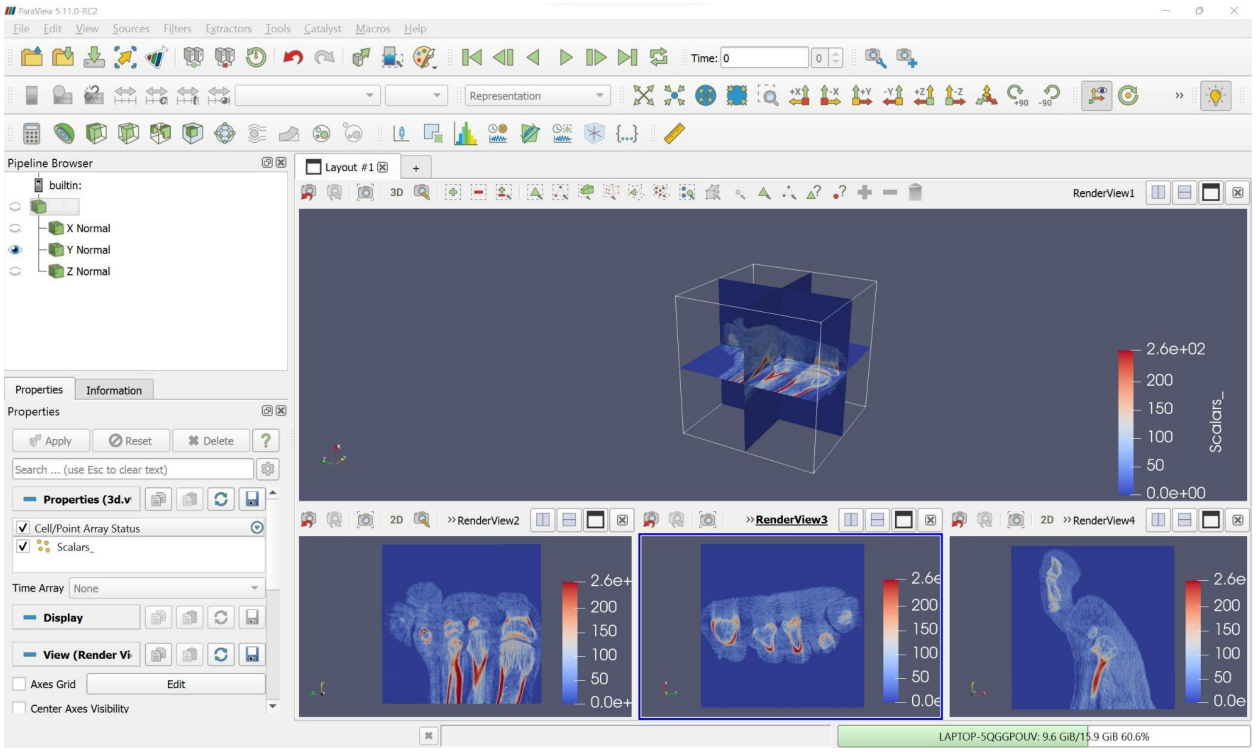
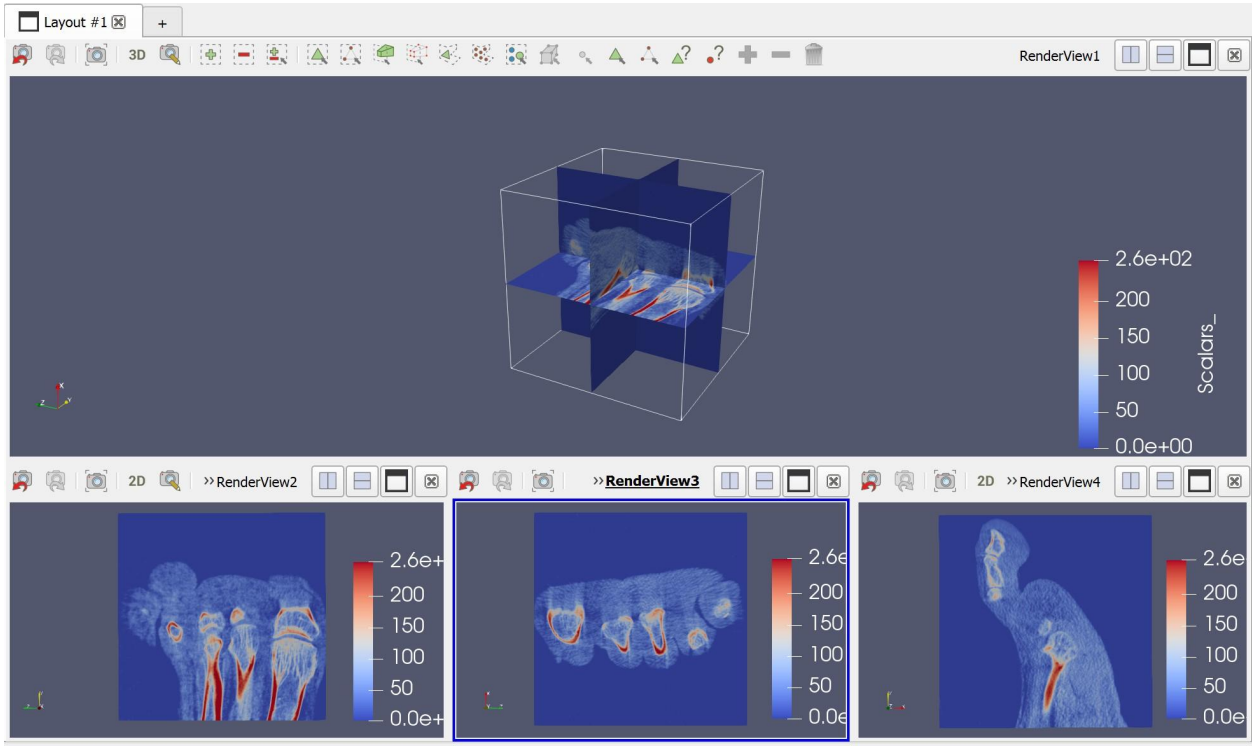


Figure 2 - Zoomed In View



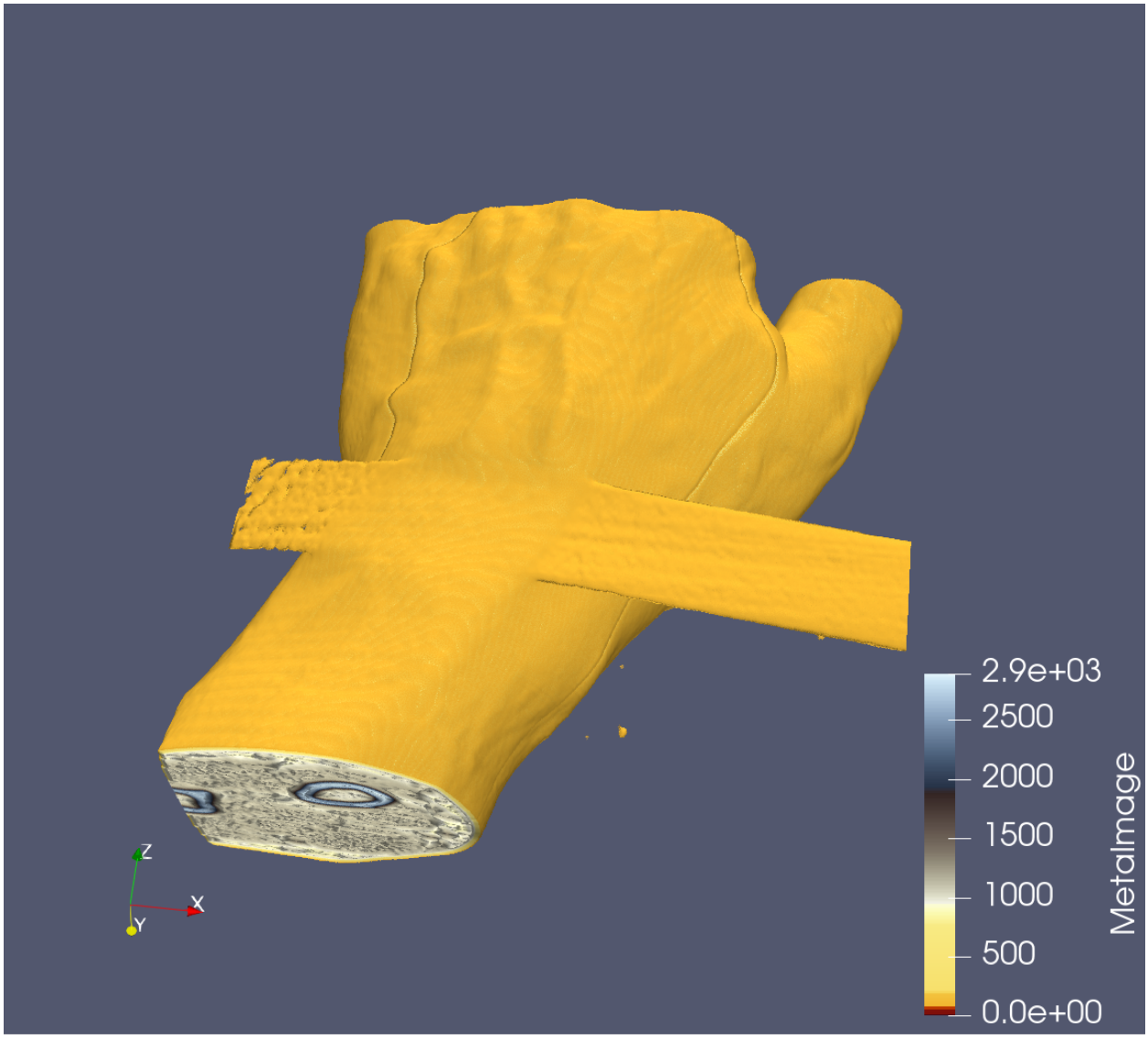
I downloaded the “3d.vti” file and opened it in Paraview. From there I began slicing the data for each X, Y, and Z normal within the pipeline browser. From there, I simply created a vertical view and then 3 horizontal views in the bottom view. Each one hides a different Axis normal. From left to right, the 2D normals seen are the X, Y, and Z normals.

Question 2

In order to actually see my working directory for each hand, open either “Question2_Hand1.pvsm”, “Question2_Hand2.pvsm” , or “Question2_Hand3.pvsm” in Paraview. More information to open it can be found in the “README” file attached.

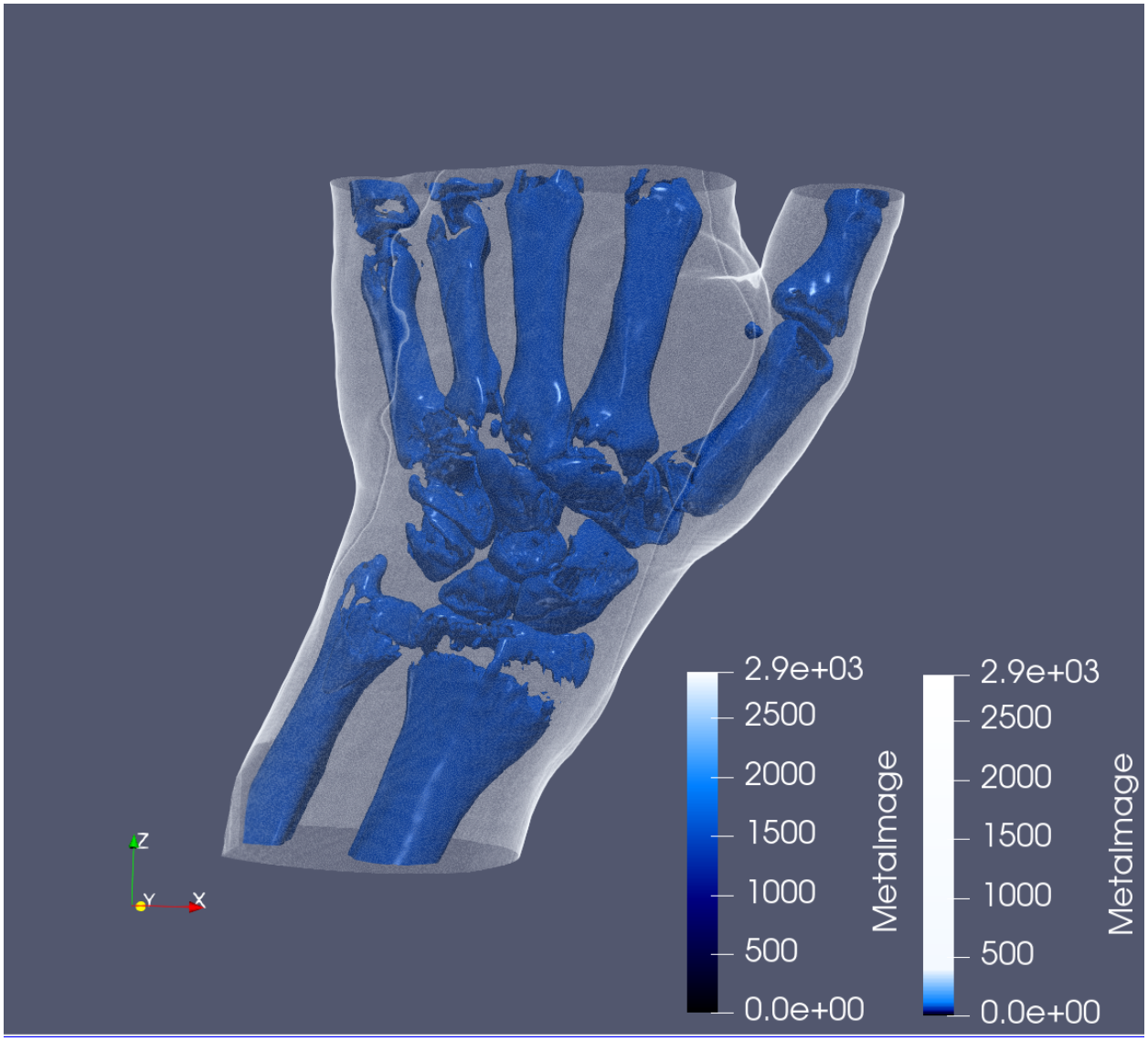
After recreating the images provided in Question 2, these were the results in the same order as presented in the prompt:

Figure 1 - Hand 1



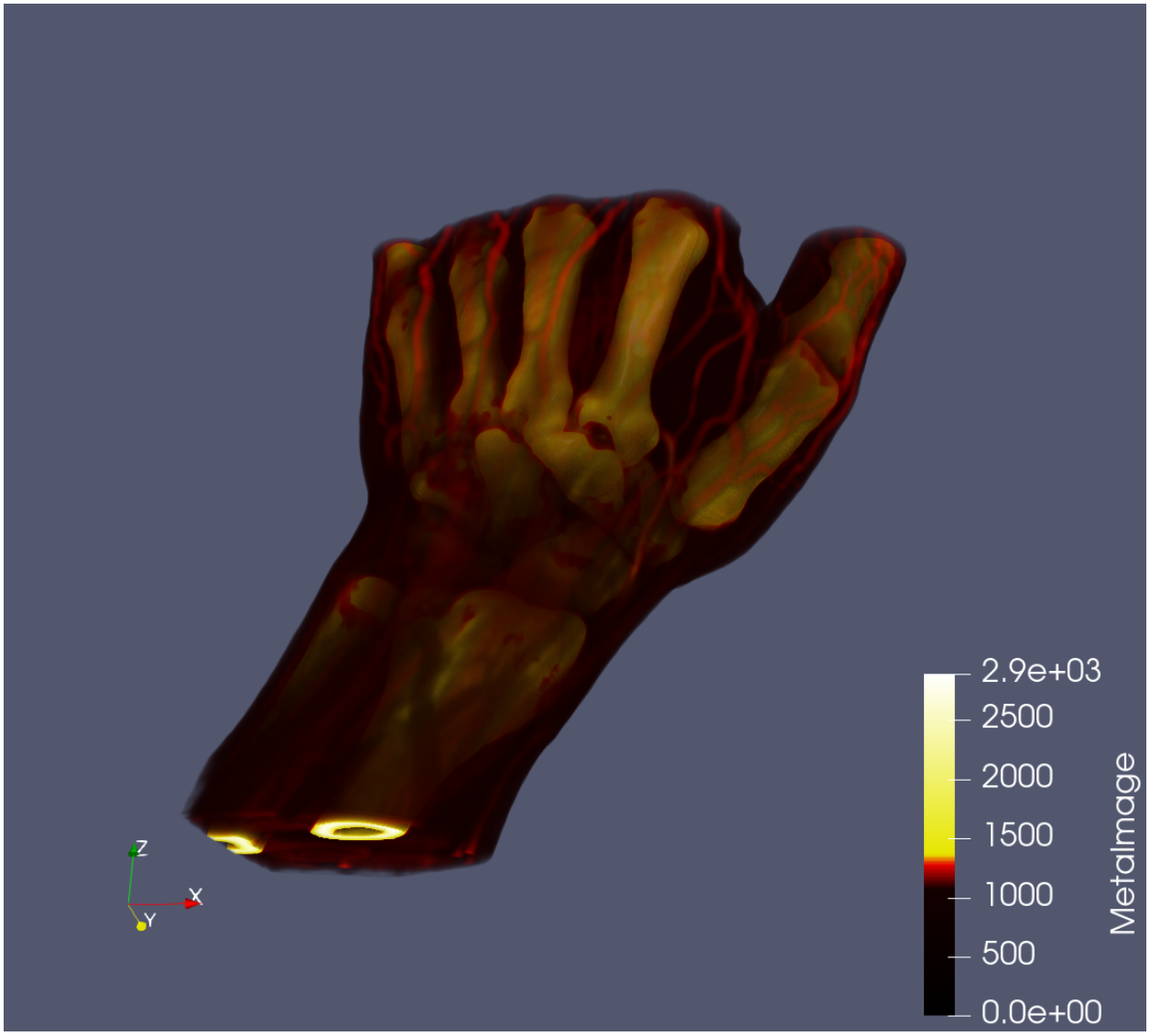
In Figure 1, the rendering method I chose was “Volume” so show the hand mesh. I also applied “Shade” to the rendered volume. From there, I changed the iso-values in the “Color Map Editor” using the “Yellow - Gray - Blue” Mapping Data option. To achieve this one color look (with the wrist strap attached), I set all values to the max color except for the starting values where I manipulated them (roughly around iso-value 88.46) to 0 alpha color to ensure the volumetric box disappeared and the strap was maintained since those were mapped near the skin.

Figure 2 - Hand 2



In Figure 2, the rendering method I chose was “Volume” so show the hand mesh. To show the bone mesh, I applied a “contour” to my hand data and set its rendered setting to “surface”. From there, I changed the iso-values for the hand mesh in the “Color Map Editor” using the “Black - Blue - White” Mapping Data option. For the bone mesh contour, I applied “specular” lighting to 1 and set its Color Map to render it as blue with the “Black - Blue - White” Mapping Data option. To achieve this look, I changed the color values to encapsulate more white than black/blue which allows for me to make the skin more white. From there, at iso-value 725, I set its color alpha to 0.659. This is how I achieved that white color with some opacity given to actually see the blue bone contour.

Figure 3 - Hand 3



For Figure 3, the rendering method I chose was “Volume” to show the hand mesh data. I then applied a “Surface Contour” to display the skeletal bone mesh and I applied specular lighting to it. I applied a black body radiation color map to the data to best reflect the image shown in the example. From there I changed around the iso-values and the volume slider to achieve a look represented in Figure 3. The iso-values for the skin here were between 159 and 955. This is where I mostly mapped the skin for the hand with the values I chose applied being iso-values 760 and 937 in the black volume area. The veins specifically were at roughly iso-value 1274, so I made my adjustments by sliding the volume slider mappings over to red to best achieve the look in the example. I applied an alpha value of 0.367 at iso-value 1220 and an alpha value of 0.435 at iso-value 1344. Lastly, the bone iso-value starts at 1380 and onward; this allowed me to make adjustments with the yellow color mapping using an alpha value of 1 to achieve a “yellow-ish” look at those iso-values.

Question 3

In order to actually see my working directory for the present, open “Question3_View.pvsm” in Paraview. More information to open it can be found in the “README” file attached. Additionally, pictures taken might be inaccurate to the current .pvsm file upon opening.

Contents inside the present:

- A Hamster
- A Cup Encapsulating the Hamster
- A Fish (or some type of weirdly shaped banana)
- A Miniature Castle or Church
- A Crystal Ball
- A Wooden Lockbox (with the 13 mechanisms keeping it shut)
- “DIESEL” letters on the wooden box

Contents outside the present still worth noting:

- Stars/Opening Decals
- Twine that wraps it

Figure 1 - Hamster, Cup Encapsulating the Hamster, Castle/Church, Fish, Crystal Ball

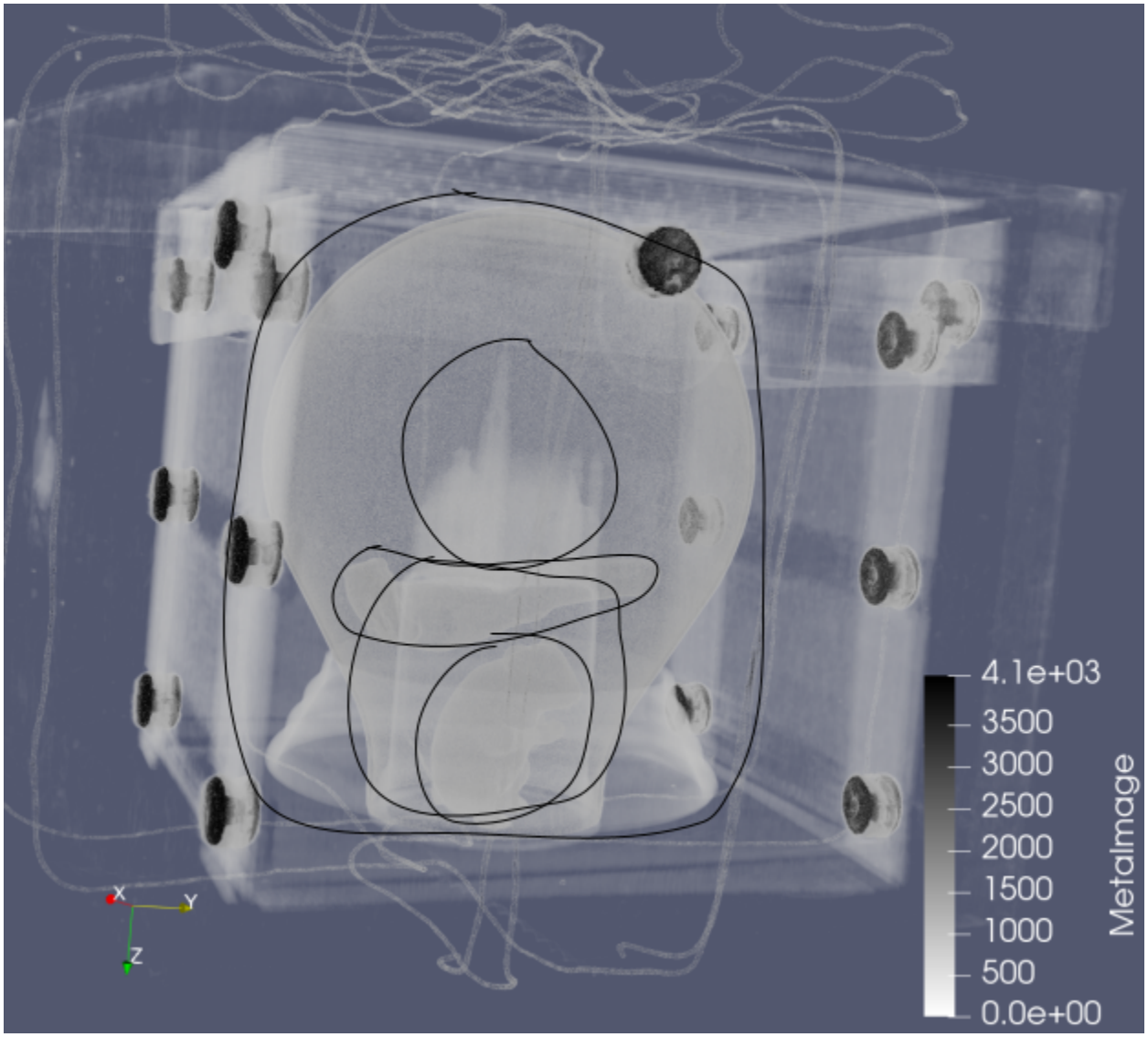


Figure 2 - Wooden Box (with Mechanisms keeping it shut)

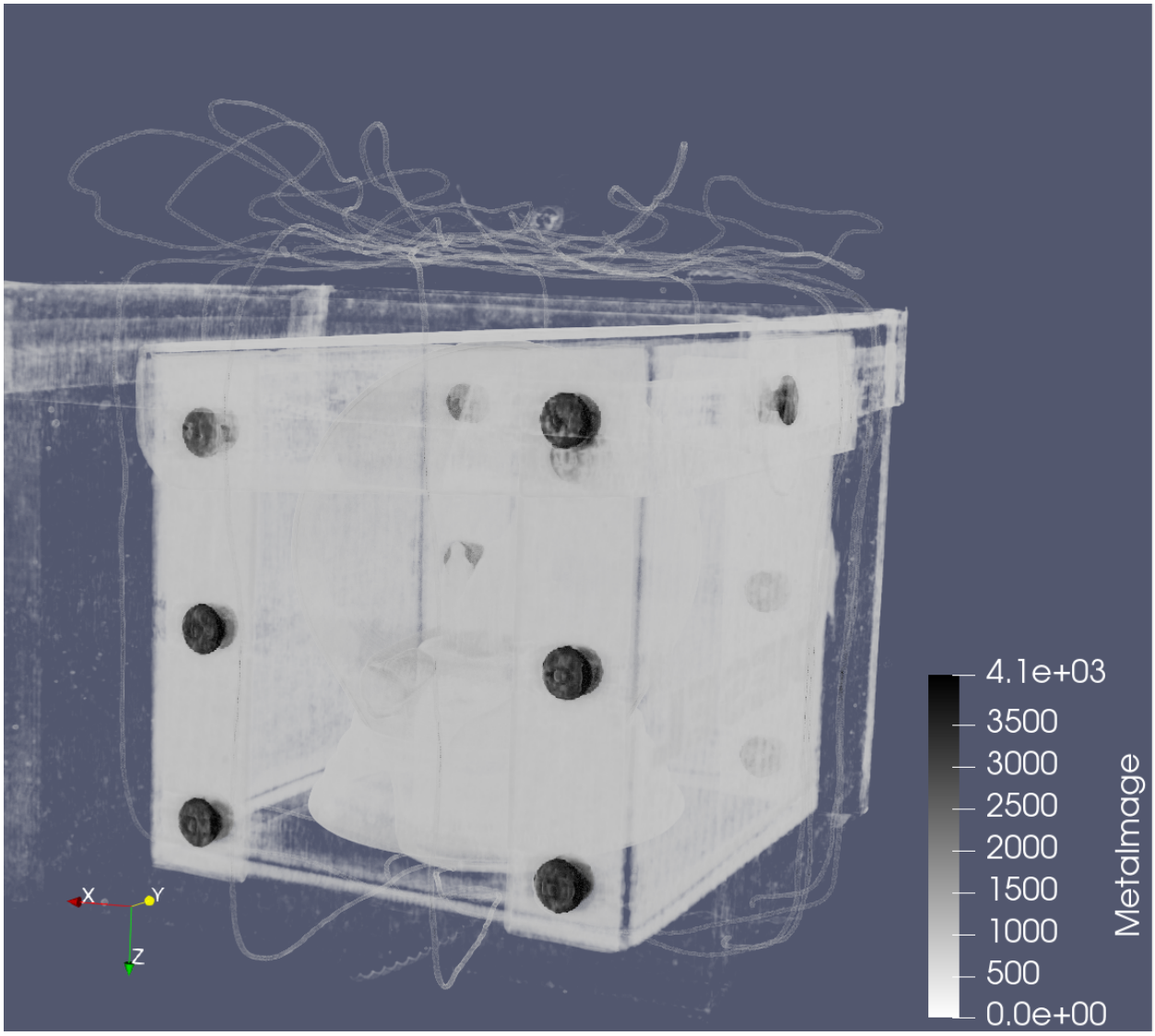
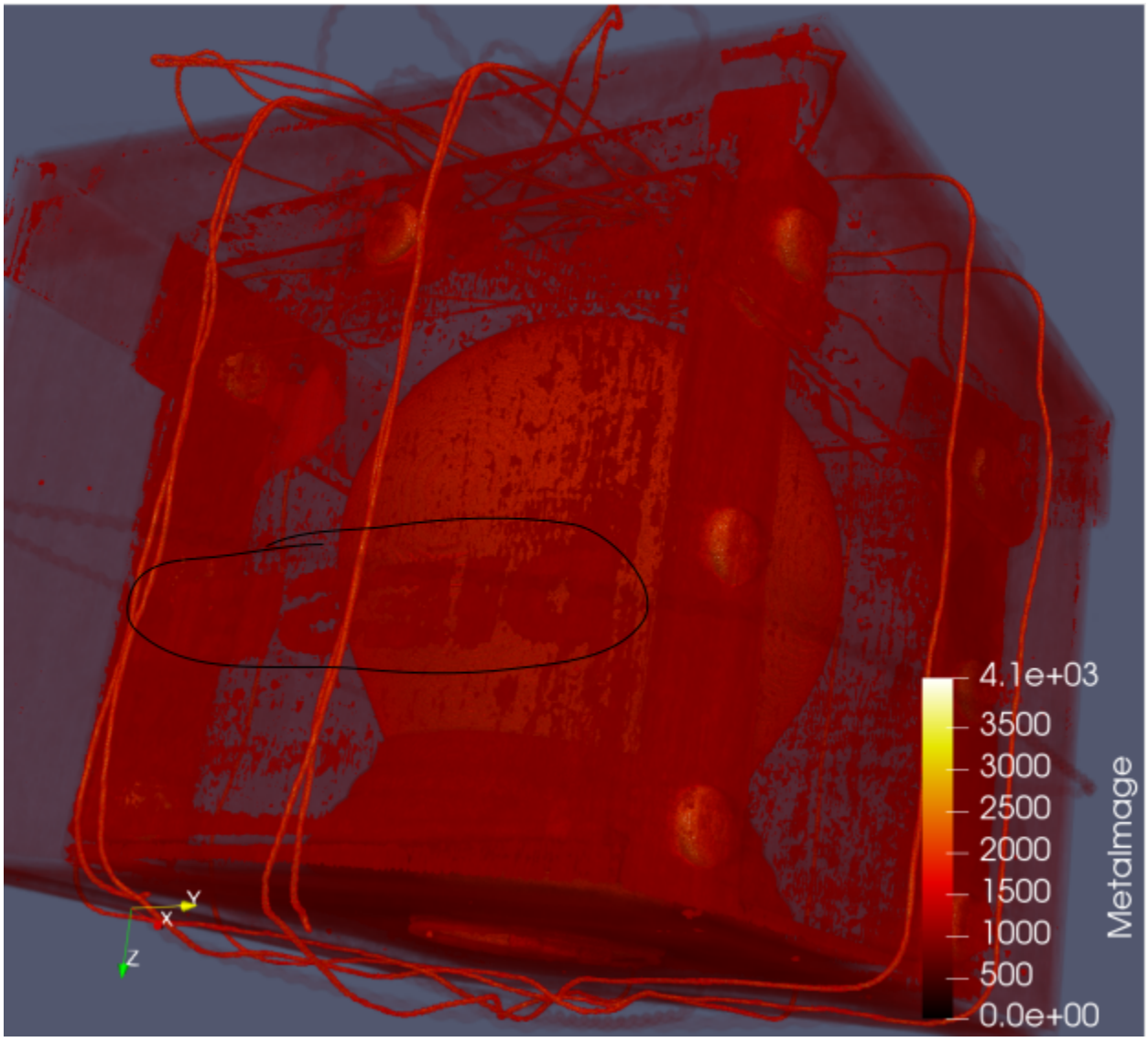


Figure 3 - “DIESEL” (written on the side of the wooden box)



As you can see from the figures, I used different color mappings to find all the objects I could. I used both x-ray (Figures 1 and 2) and a black body radiation color map (Figure 3). These are in “Question3_View1.pvsm” and “Question3_View2.pvsm” respectively so have a look for yourself! For Figures 1 and 2, I only applied a contour to show the present. From there, I particularly altered the iso-value at 1947 to full opacity and turned the previous values to 0 opacity in order to look inside the present and Identify the objects in Figure 1. For Figure 2, I just adjusted the iso-values at 891 to full opacity and turned down the values representing the objects in Figure 1 at iso-value 1947 to opacity of 0. This turns the wooden box into a more visible image as seen in Figure 2. In Figure 3, I changed the view such that there’s also a contour added in order to view the items on the outside of the present, but I noticed that I now could find the “DIESEL” letters on the wooden box when adjusting the iso-value at 967.

Sources

1) https://my.eng.utah.edu/~cs3200/Paraview.pdf

2) https://my.eng.utah.edu/~cs3200/Scalar-Fields1.pdf