Date: 2-15-18
Due Date: 3-1-18

CS 6635: Visualization for Scientific Data

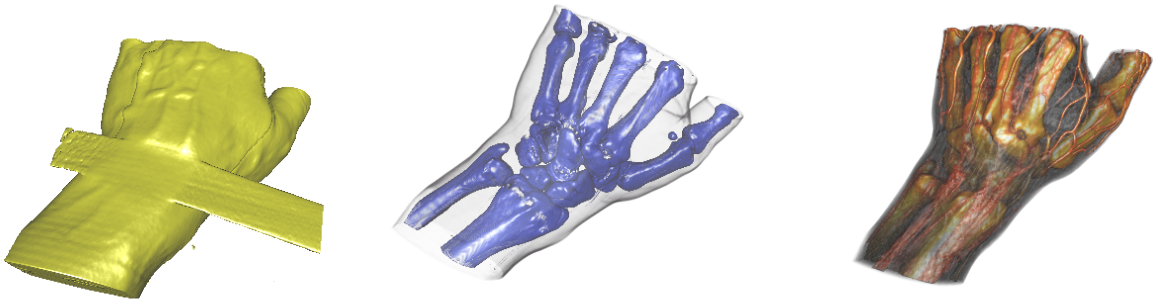
Assignment 3

In addition to ParaView, this assignment involves using ImageVis3D, a software program developed in the Scientific Computing and Imaging Institute at the University of Utah. The program, documentation, and example datasets are available at:

http://www.sci.utah.edu/software/imagevis3d.html

1. Visit the software page listed above, and click on the "Data' link in the ImageVis3D section. Download the `hand16.uvf` dataset and the `hand16.1dt` transfer function. Start ImageVis3D and load the hand dataset.

    - Try to recreate each of the following images by manipulating the isosurface and/or 1D/2D transfer function settings (the background color can be changed in ImageVis3D's preferences) and submit images (hand1, hand2, hand3) of your results.



    - What rendering method did you use for each image? How did you chose the settings?
    - What iso-value(s) correspond to the skin? What iso-value(s) correspond to the bone?

2. Repeat Problem 1 using ParaView. To get the hand data set into ParaView, you will need to convert the data from uvf format to mhd format:

   - In ImageVis3D use File Export Dataset
   - Select ”Kitware MHD format”
   - Type in a filename in the dialog
   - Click ’okay’ and it will create the file designated, which can then be loaded into ParaView

3. Download the `present.uvf` dataset from the class website:

   `http://www.eng.utah.edu/~cs6635/present.uvf`

   Please note this is a large data set – about 250 Mb – so make sure to use a fast internet connection.

   - Use volume rendering within ImageVis3D to visualize the data and find out what is in the “present”.
   - Try to identify as many objects as you can. State what you believe the objects to be and submit images showing the objects.
   - What techniques and/or special settings did you use to identify the objects?

4. Repeat Problem 3 using ParaView. Did you find more (or fewer) items? Was ParaView or ImageVis3D easier to use for this task?

5. Required for CS 6635 Students. Download the “unknown” data set `data.zip` from the class website:

   `http://www.eng.utah.edu/~cs6635/data.zip`

   Use ImageVis3D to load and convert the data. This is a real research data set from a large-scale simulation. Keep in mind that unlike the previous data that was stored in ImageVis3D’s native UVF file format, the data you find in the ZIP archive is raw data so you need to “guess” the size and type of the data. Submit images of the data and describe what you see.

What to turn in

Write a *short* report explaining and documenting your results and answering any questions asked above. Be sure to explain any figures you submit. Your homework is primarily graded upon your report. Please submit your report on Canvas in PDF format.