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**Scientific Visualization Creative Inquiry – Report**

Week 1:

* Downloading and running Paraview.
* Reading the Paraview tutorial.

Week 2:

* Loading different datasets in Paraview.
* Resetting a session.
* Applying filters to a specific dataset.
  + Using the threshold filters to view one specific component.

A picture containing text, vegetable

Description automatically generated

* + Using the threshold filters to view the interface between components.

A picture containing text, fabric

Description automatically generated

* + Using the clip filter to look at the inside of a dataset.

A picture containing text

Description automatically generated

* + Combining different filters to highlight interesting aspects of the data.

A map of the world

Description automatically generated with medium confidence

* Changing the colors of the components.

A screenshot of a map

Description automatically generated with medium confidence

Week 3:

* Finding other datasets online and running filters/color changes on them.
* Using the “Save State” and “Load State” functions to store and run filters.

Week 4:

* Tracing the session to create a python script of the state.
* Modifying the python script to work with multiple datasets.
* Applying filters and changing their parameters using Python.
* Saving states and screenshots of the filtered models through Python.

A map of the world

Description automatically generated with medium confidence

Week 5:

* Using the animation feature in Paraview.
* Adding and changing filter parameters in succession to animate the filters and display the data model in different states.
* Saving an animation as an animation file.
* Saving an animation as an MP4.
* Loading an animation file.

Week 6:

* Attempting to use the “Material Interface Filter” on a dataset. (Did not function as intended. Paraview was missing proper documentation on this filter and they had also changed its functionality at some point.)

Week 7:

* Using the Contour filter to find a dataset’s interface.

A close-up of a rock

Description automatically generated with low confidence

* Downloading and running MeshLab.
* Converting .vti files into .ply files through the Save Data function in Paraview.
* Running the “Discrete Curvature” plugin on the .ply dataset.

Map

Description automatically generated

Week 8:

* Using the “igl” and “meshio” to determine the discrete gaussian curvature on a dataset.
* Storing the curvature data as a numpy array.
* Adding the curvature data to the original dataset as a field data parameter.

A close-up of a rock

Description automatically generated with low confidence

Week 9:

* Using Matplotlib in python to display the distribution of curvatures.

Chart, histogram

Description automatically generated

* Adding bins to edit the histogram ranges.

Chart

Description automatically generated

* Filtering out data that made the graph unreadable. (There were too many datapoints where |x| < 0.01, which made the histogram center a giant pole while everything else was flattened in comparison.)

Chart, histogram

Description automatically generated