Contact: Jonathan B. Glass: jbglassij@gmail.com

Usage

Step 1:

Import an image stack.

Step 2:

Clean off any major blemishes from the stack.

Step 3:

Run Export Point Cloud->Point Cloud. The user will be presented with a list of options:

- *Start slice*, *end slice* and *step size* allow the user to extract data from a subset of the stack. For large stacks these options make the amount of data more manageable.
- *Upper threshold* and *lower threshold* set the color range that will be extracted. The color range has only been tested on gray-scale images, so it may be necessary to gray-scale the stack first.
- *Starting point* and *ending point* are intended to allow the user to reduce the data being examined to a specific portion of the CT-Scan.
- *Output surface points only* ignores internal data points.
- *File type: This* drop-down menu allows the user to select the type of data file created. To export as a simple list of comma delimited Cartesian coordinates select 'txt'. To export a point cloud in a format compatible with Paraview select 'vtk'. When saving in 'txt' format, another dialog box will give the option of adding a custom header to the file.
- *Output as single file* produces individual files for each CT-Scan slice examined.
- *Append to file* adds the data collected to the end of an existing data file.

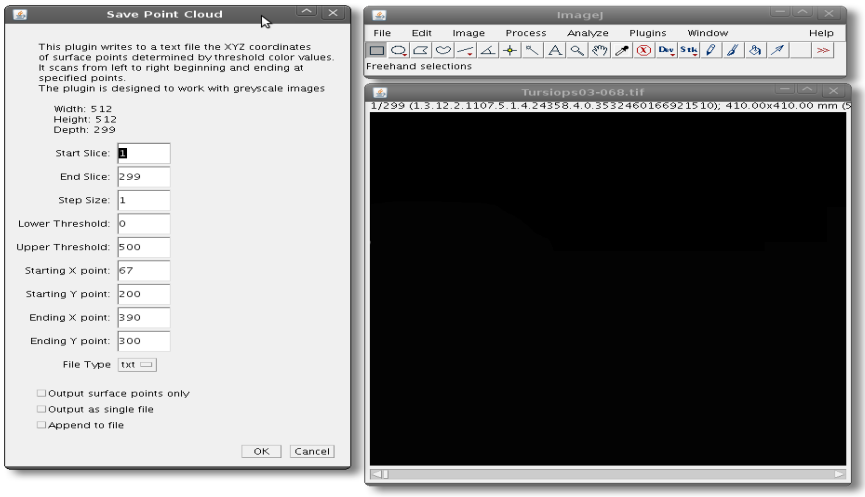


Figure 1. The Point Cloud plugin main menu.

Step 4:

After choosing ok, a standard dialog box will appear to save the data file. Data saved as a txt file can be imported into Excel, Matlab, or Pro-E. The vtk option was specifically designed to work with Paraview, an open-source program that is readily available on the web and provides a suite of additional tools and filters. For example, a Delaunay 2D filter can produce a three-dimensional model capable of being saved in STL format. Custom mathematical models can be applied to the points through Paraview as well (see figures 4 and 5).

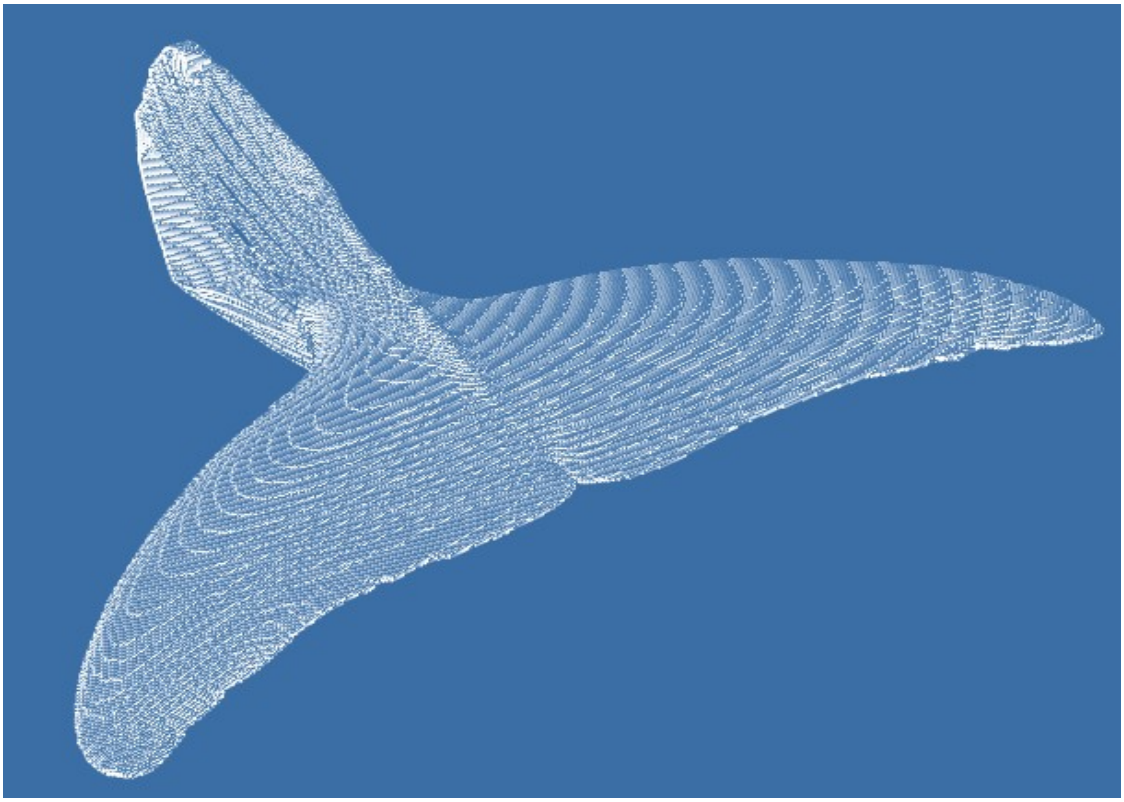


Figure 2. A point cloud of the fluke from a Common Dolphin (D*elphinus delphis)*.

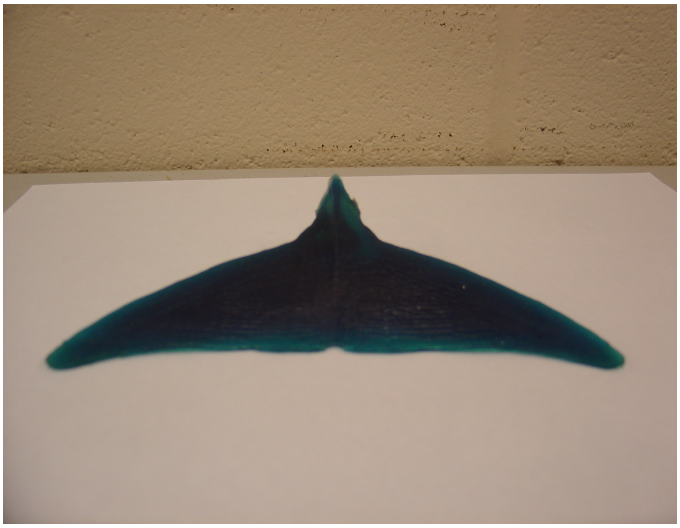
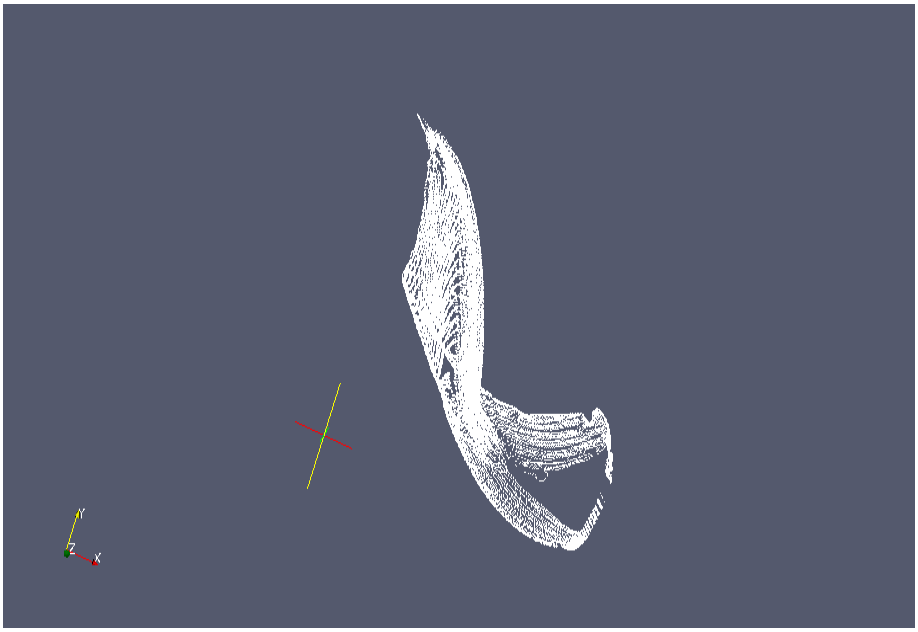


Figure 3. The end result: a flexible model created solely from CT-Scan data.



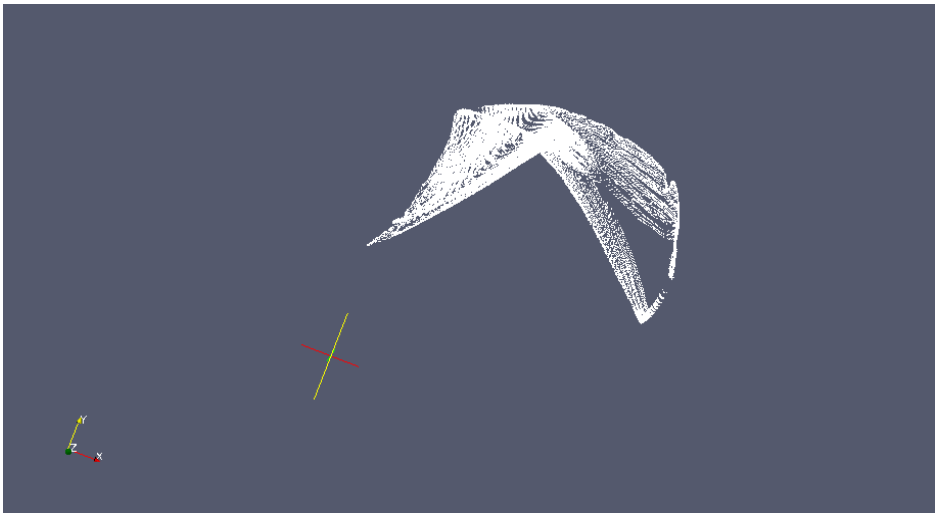


Figure 4,5: A mathematical model can be applied to the point cloud using Paraview.