

# Aim

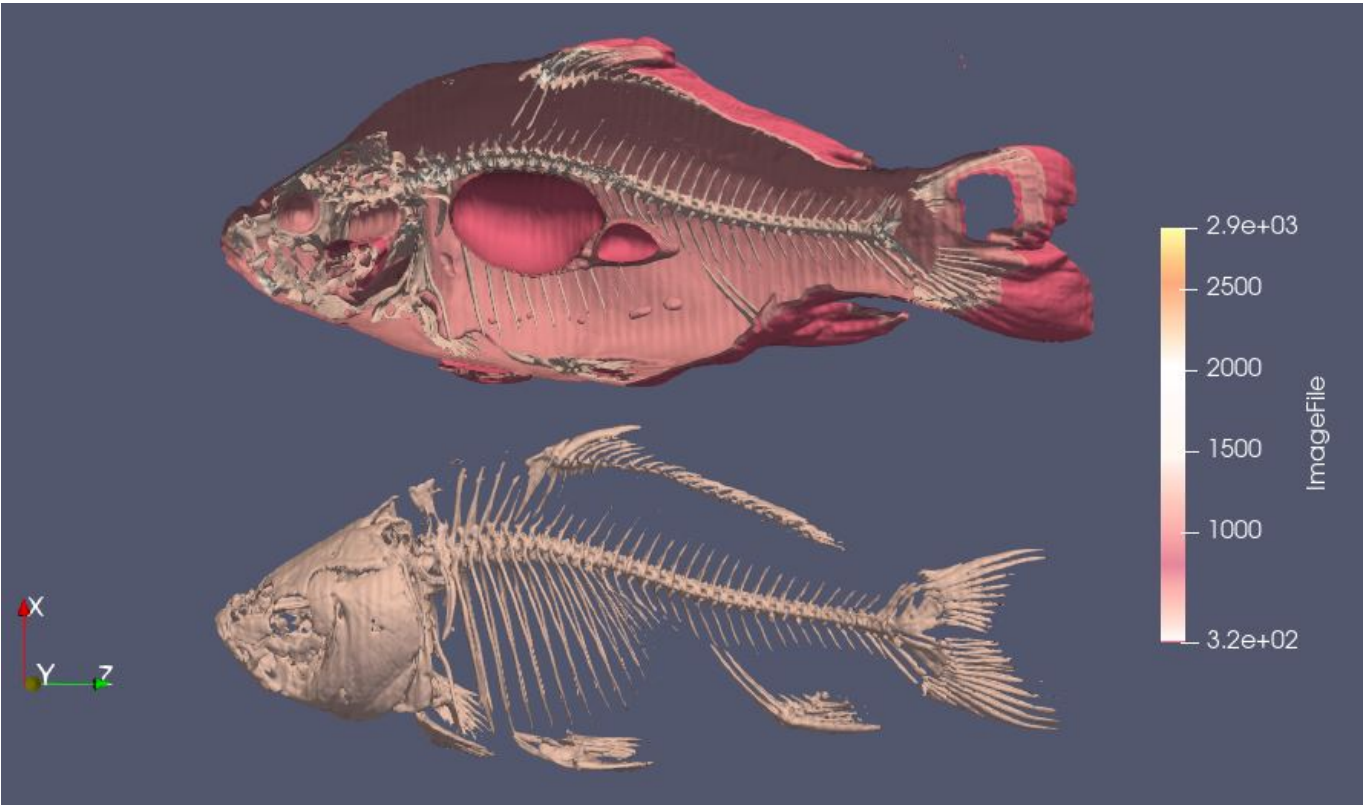
The aim of this visualization is to explore the given data using techniques of volumne visualization to find interesting and meaningful visualization.

# Visual Design Type

Volume Visualization showing the object within the raw dataset `data2`.



# Visualization


Volume render of an object(fish) showing the inner skeleton with the outer body. Also an cross-section of fish to relate the position of carcus with the body.



# Visual Mappings

## Legends

Mapping	Range
Bone	
Flesh	

Mapping	Range
Outer Skin	

## Color Map

A custom color map has been used in this visualization. Following are the settings for the preset

No	Value	R	G	B
1	319	1	0.435	0.5568
2	319	1	1	1
3	800.509	0.9098	0.525	0.6078
4	1450.55	1	0.9098	0.945
5	2020.33	1	1	1
6	2871	0.9843	1	0.6705

Opacity Transfer function values

Value	Opacity
319	0.45
1956.13	0.3812
2871	1

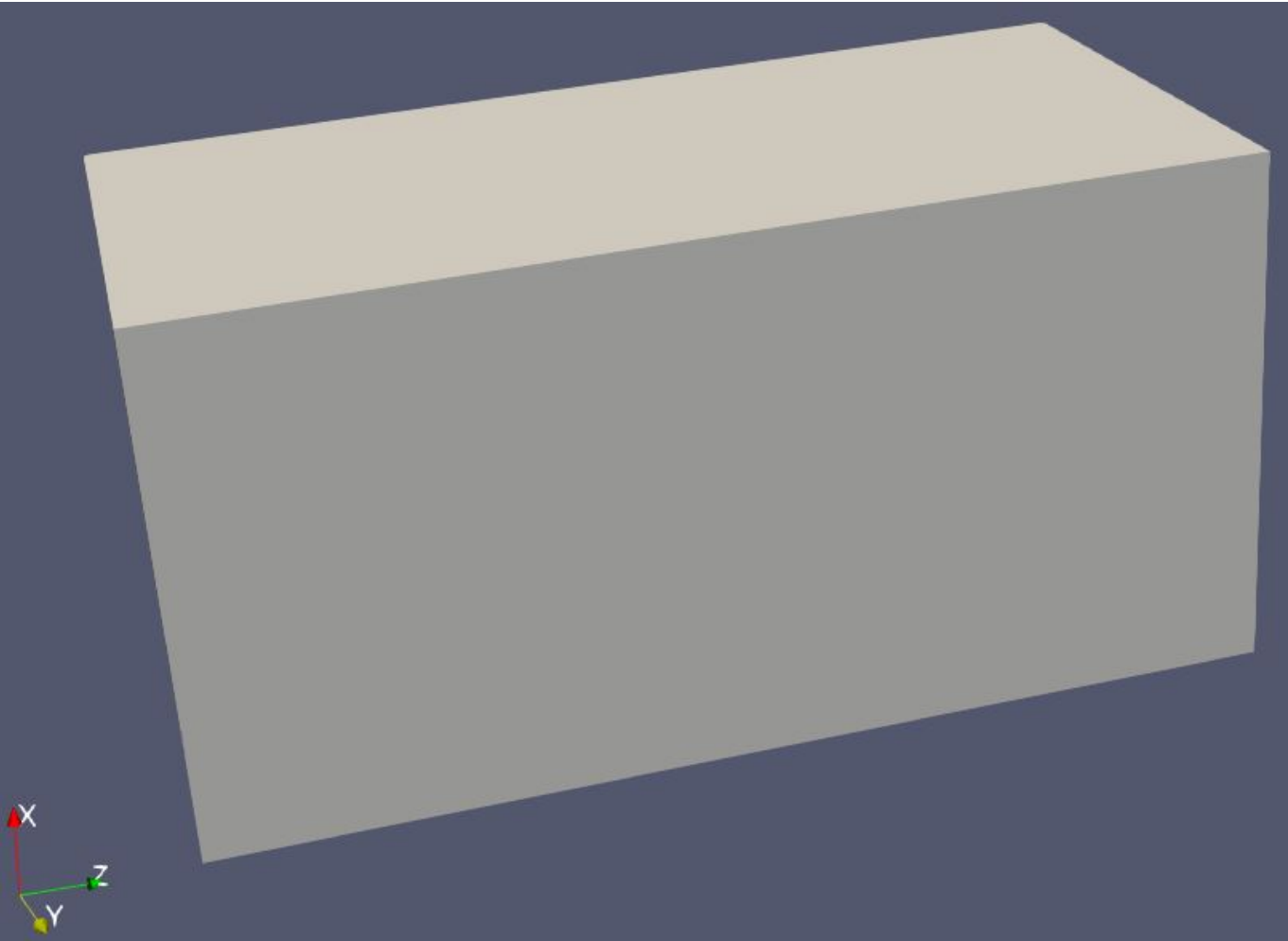
## Data Preparation

We need to explore the dataset and find the hidden pattern in it. We take the below steps to achieve this.

1. Load the dataset **data2** and specify the Data Extent in properties window with representation as **Surface**. The values used for Data Extent as listed below.

Property	Value:
X	255
Y	255
Z	511
Read As Image Stack	Y

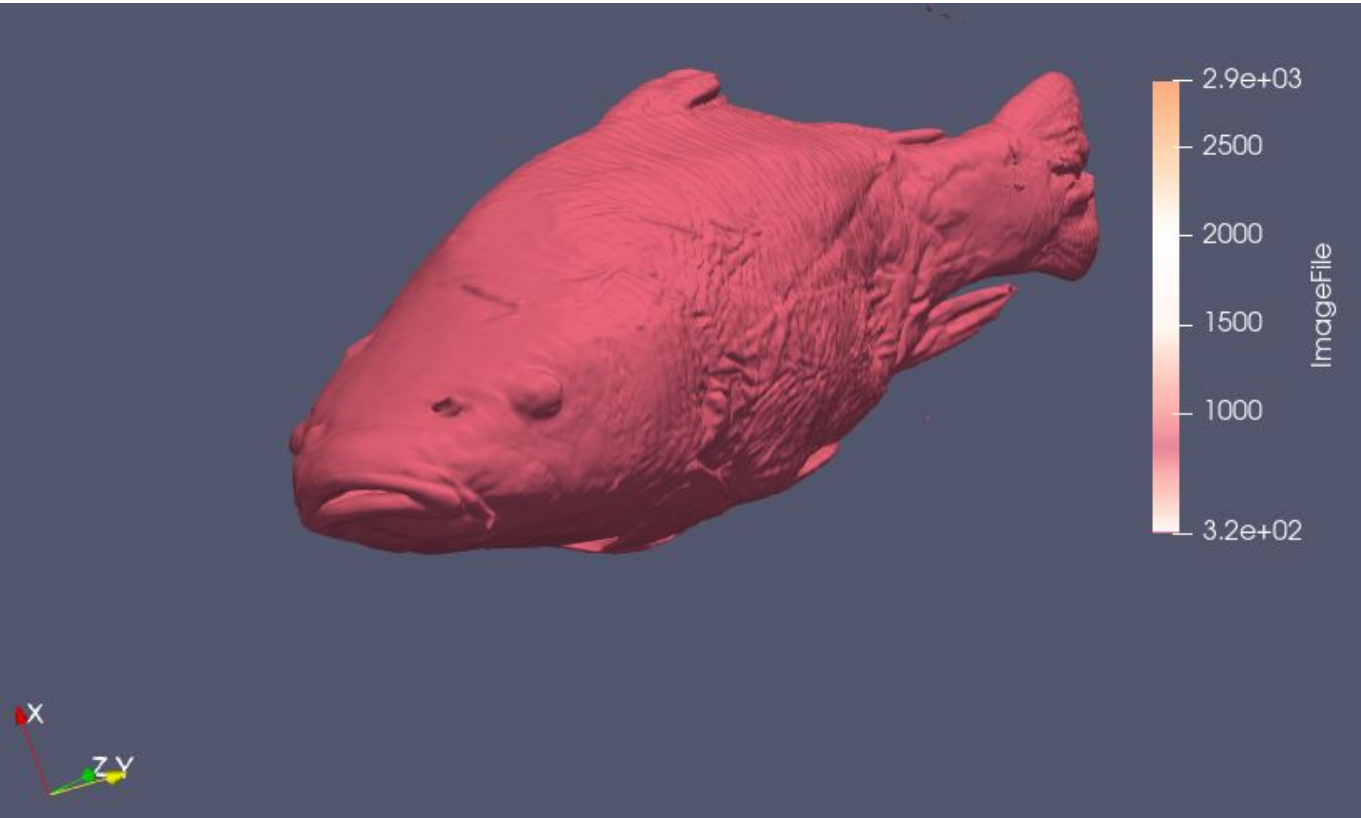
produced the below image



2. Since the previous step didn't show much of object. We will apply the **Contour filter** to find the iso surfaces in the dataset with a **Linear Series** of **10 data points** with range **[0,2871]**, however this would result in a very noisy result which need to be filtered further. A short summary below of the setting is below. **Colormap** used is **X Ray** preset.

Property	Value
Sample size	10
Range	0 - 2871
Type	Linear
Compute Normals	Y
Compute Gradients	N
Compute Scalars	Y
Compute Triangles	Y
Representation	Surface
Data Axes Grid	N

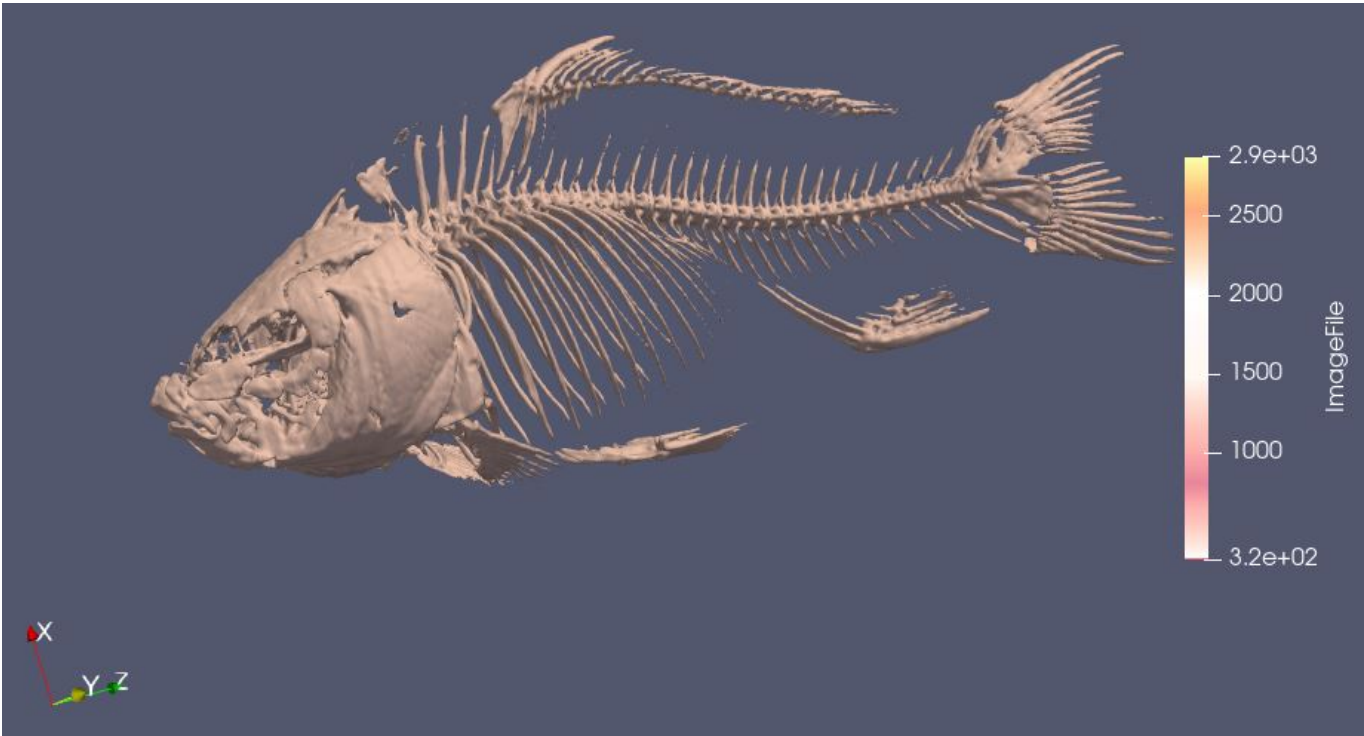
produced the below image



3. Now that we have the subject visible as now need to explore the inner parts of the subject to reveal more details. We use the **Threshold filter** to find out the scalar which lie in the range(1000-3000), this parameter needs to be selected carefully yo obtain the desired result.

Property	Value
Scalars	ImageFile
Minimum	1000
Maximum	3000
All Scalars	Y
Use Continious Cell Range	N
Invert	N
Representation	Surface

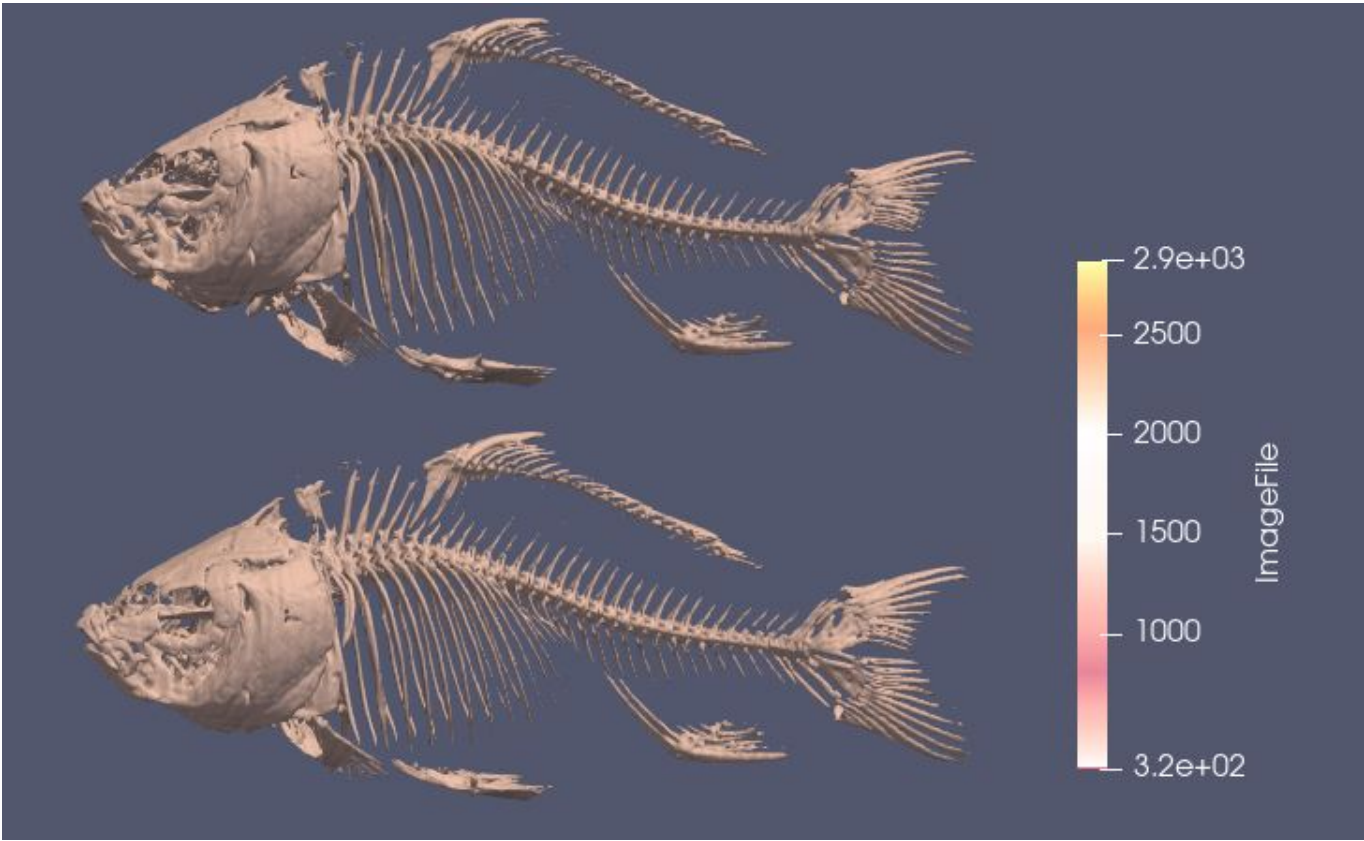
produced the below image



4. To do a more comprehensive comparison we make a copy of the object just below it using the **Transform filter** with the below settings.

Property		Value
Show Box		N
Parameters	Translate	(-220, 11.98, 0)
	Rotate	(0,0,0)
	Scale	(1, 0.945, 1)
Translation		Y
Scaling		Y
Rotation		Y
Face Movement		Y

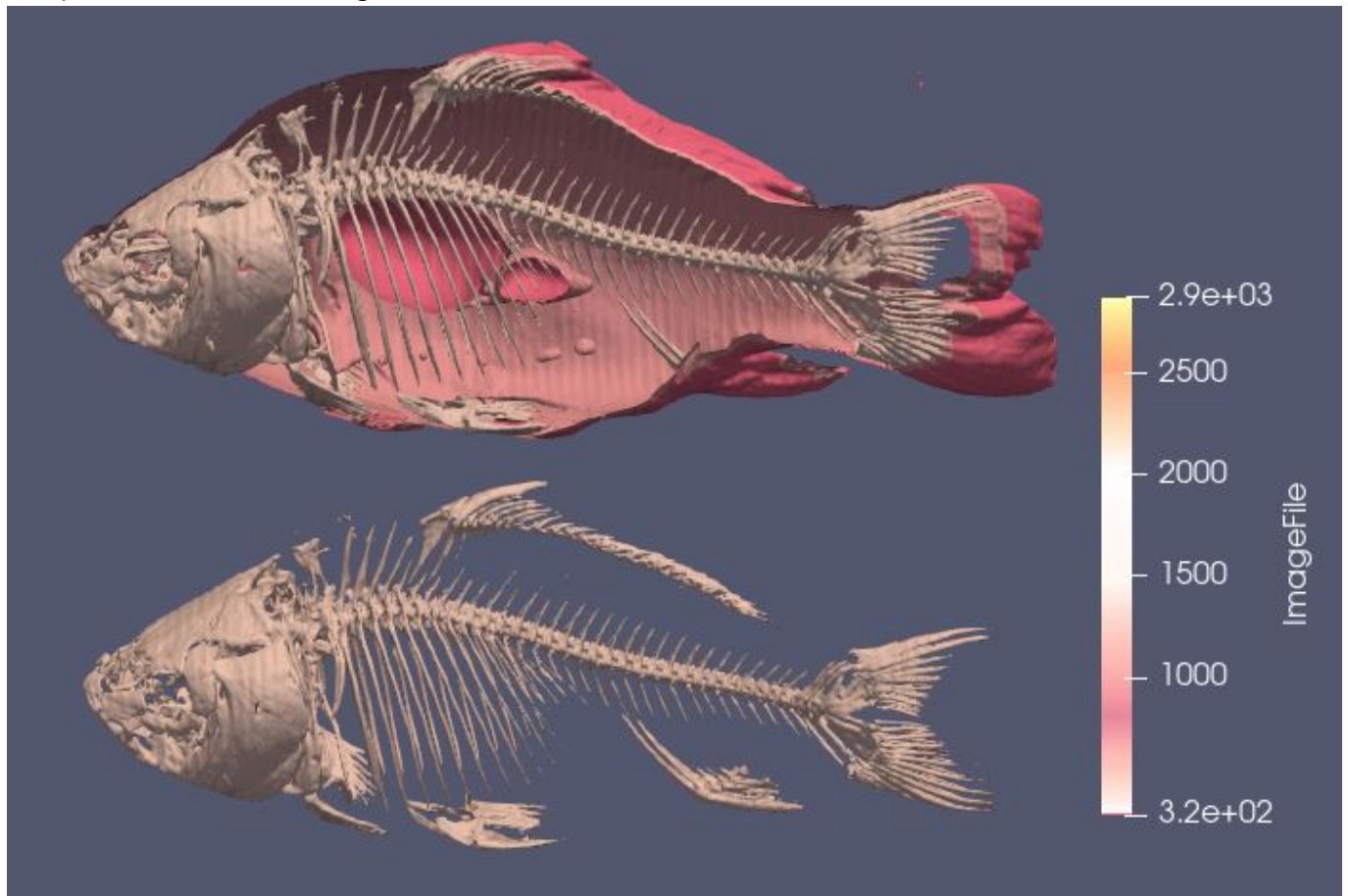
and produced the below image



5. Finally we apply a **Clip filter** on the **Contour filter** which will be applicable on the top object to get a cross-section of the fish and get a clear view of the relationship between the carcus and the flesh body. Settings for the clip filter are below.

Property		Value
Clip type		Plane
Show Plane		N
Parameters	Origin	(131.35, 147.435, 248.45)
	Normal	(-0.046,0.955,0.2901)
Invert		Y
Crinkle Clip		N

and produced the below image



## Improvements

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1. This visualization is limited to the representation of object in the dataset.
2. It could be better visualized with the data about the organs of the fish.