Aim

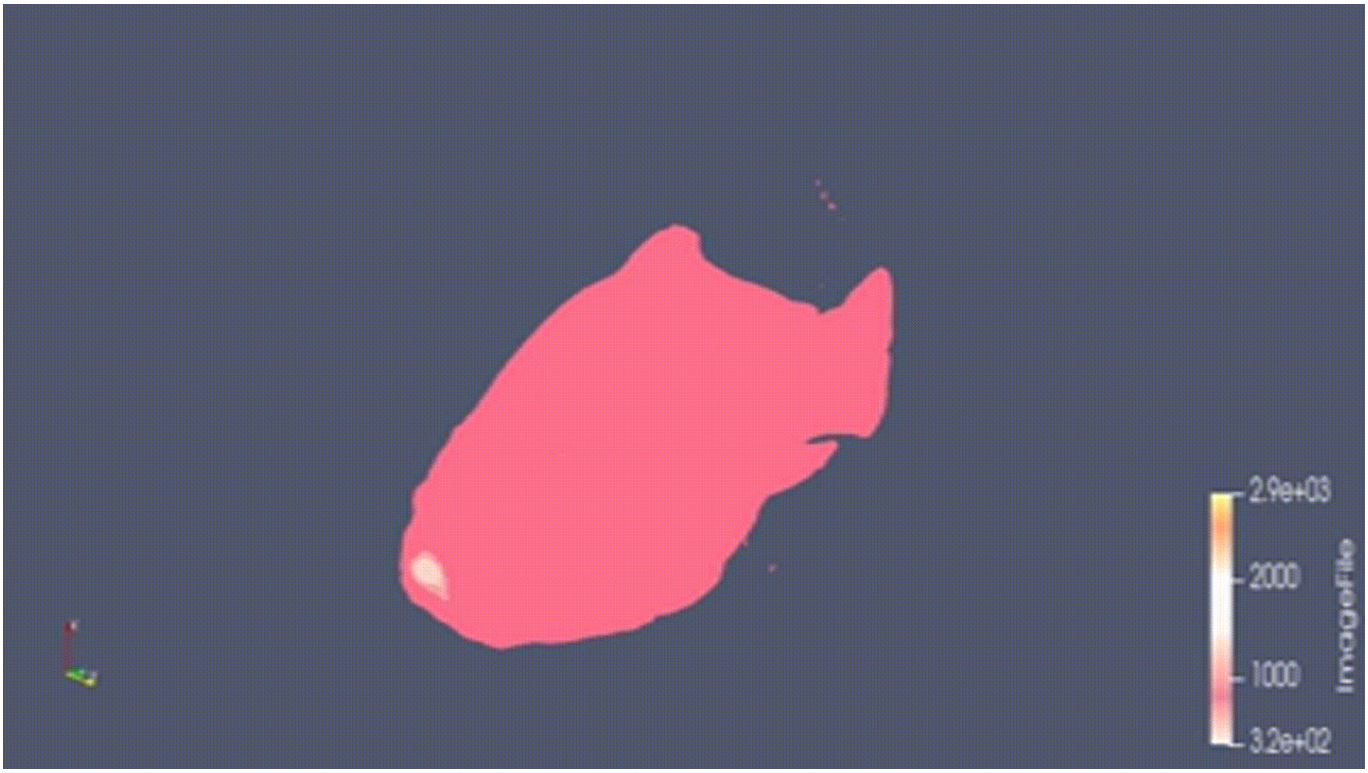
The aim of this visualization is to explore the given data using techniques of volumne visualization to find interesting and meaningful visualization.

Visual Design Type

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

Visualization

Volume Visualization showing an animation of the different cross-section of the obejct(fish).



Visual Mappings

Legends

Mapping	Range
Bone	
Flesh	
Outer Skin	

Color Map

A custom color map has been used in this visualizaton. 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

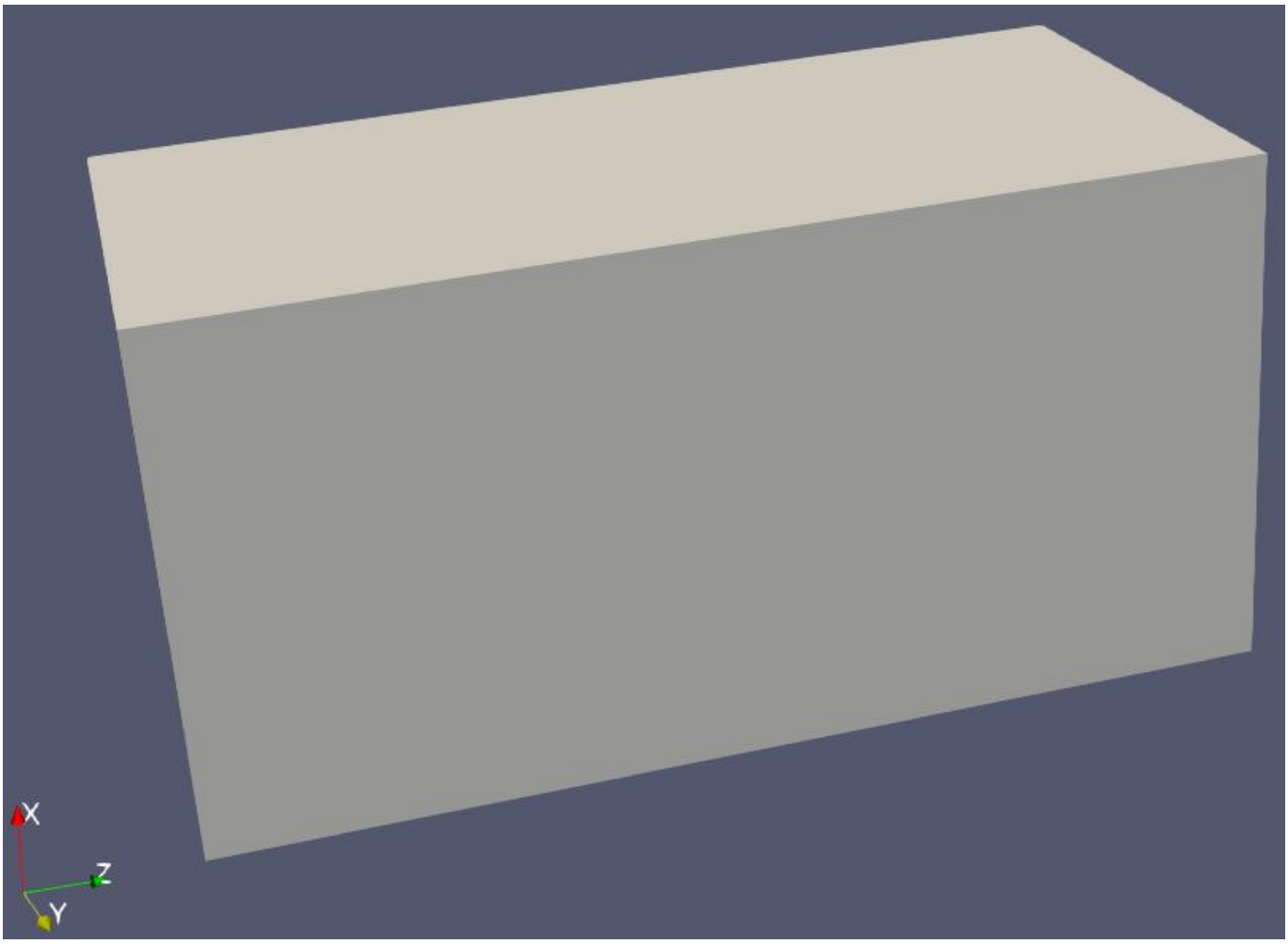
Data Preparation

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 respresentation as `Surface`. The values used for Data Extent as listed below.

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

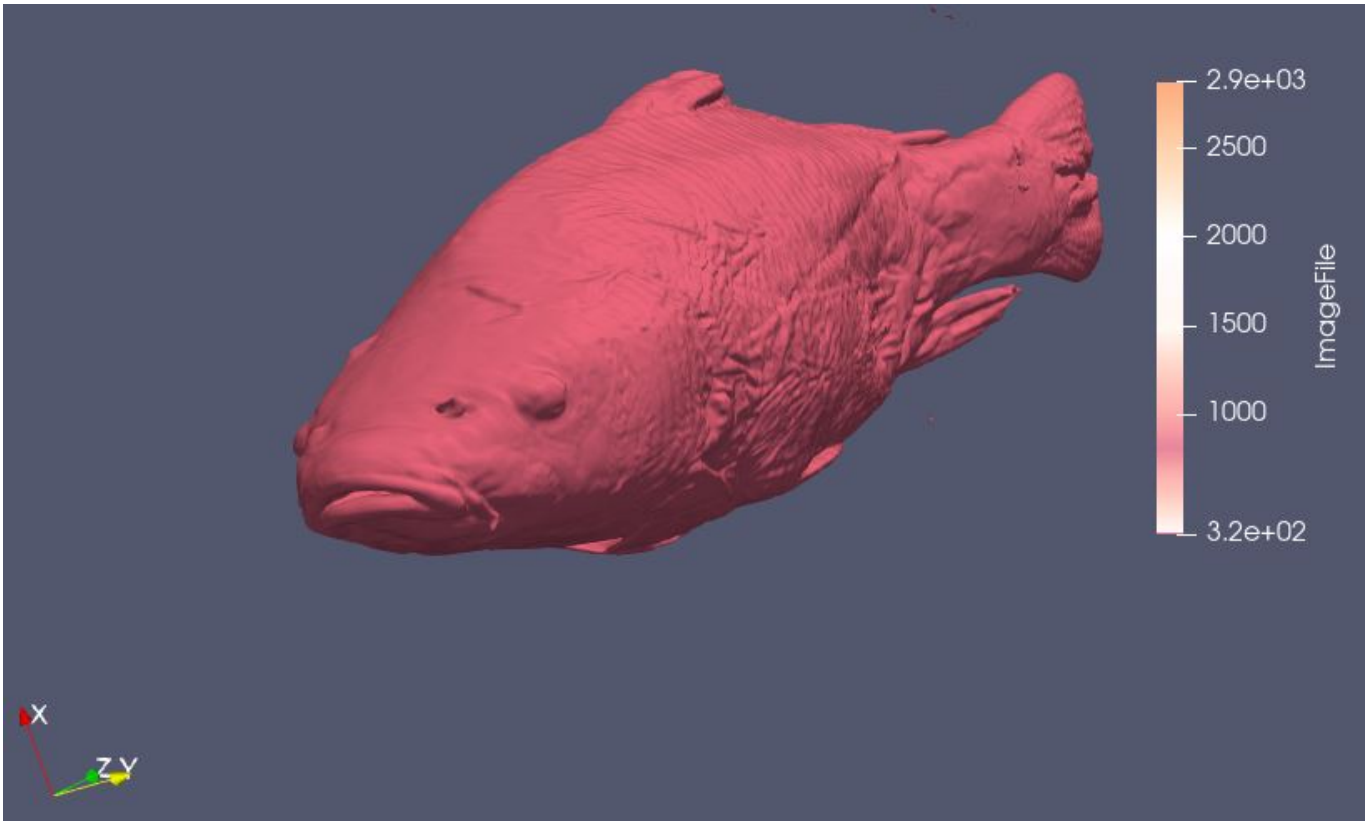
produced the below image



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. Once we have the model for fish ready, we need to get multiple slices inorder to get an cross-section animation.

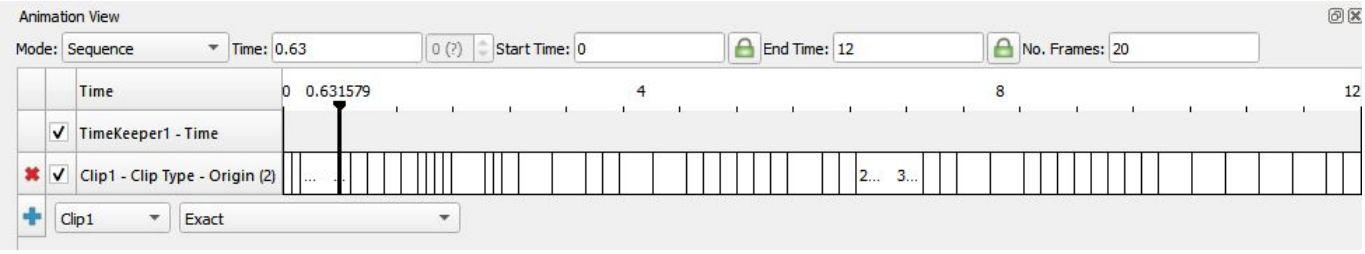
- Add a `Clip filter` and and position the clipping plane at the start of the fish on z-axis by applying the below settings to get the clips.

Property		**Configuration**
Clip type		Plane
Show Plane		Y
Invert		Y
Representation		Wireframe
Crinkle clip		Y
Parameters	Origin	`(50.70, 53.82, 51.63)`
	Normal	`(0.0066,-0.00713,-0.999)`

- Add animation view from the top menu bar, view -> Animation view. We need to add clips on the animation veiw that would apply `clips at different interval` and keep clipping the fish along `z-axis`.

Property	**Configuration**
Type	Clip1

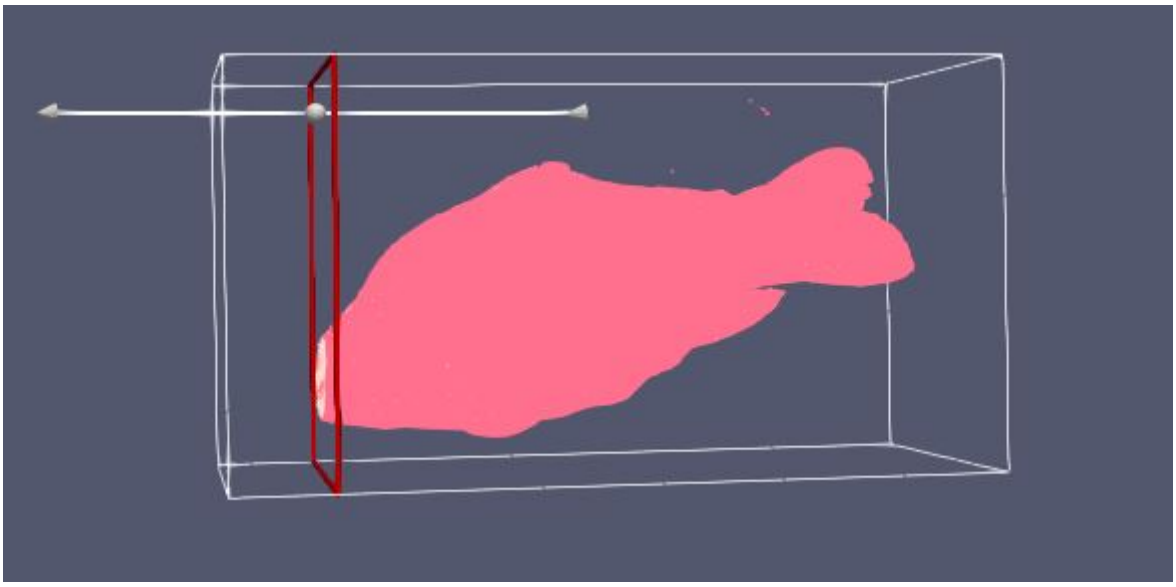
Property	Configuration
Property	Clip1 - Clip Type - origin (2)



- Double click on the empty keyframes and add keyframes, that would clip the fish at specified time interval and display the clip selection.

Property	Configuration :
data representation	wireframe
Keyframes	[24, 28.101, 32.203, 56.812, 64.265, 71.718, 79.171, 86.825, 90.135, 94.078, 97.804, 101.531, 116.43, 120.164, 123.890, 131.343, 146.25, 161.156, 168.609, 176.0625, 190.96, 205.875, 213.328, 220.781, 228.234, 243.140, 250.593, 265.5, 272.95, 280.40, 310.21, 317.67, 340.031, 362.3990, 377.296, 392.203, 407.109, 429.46, 459.28, 474.18, 496.546, 504]
TIme	[0, 0.093, 0.187, 0.75, 0.93, 1.125, 0.6315, 1.5 , 1.68, 1.78, 1.875, 2.25, 2.343, 2.43, 2.625, 3, 3.375, 3.75, 4.12, 4.5, 4.68, 4.87, 5.062, 5.25, 5.437, 5.625, 6, 6.187, 6.375, 7.125, 7.312, 7.5, 7.875, 8.25, 8.437, 8.62, 8.812, 9 , 9.187, 9.375, 9.56, 9.75, 10.125, 10.5, 11.25, 11,625, 11.812, 12]
Mode	Sequence
Start Time	0
End Time	12
No. Frames	20

this will produce a picture like below



Improvements

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 or viens of the fish.