

## Aim

---

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

## Visual Design Type

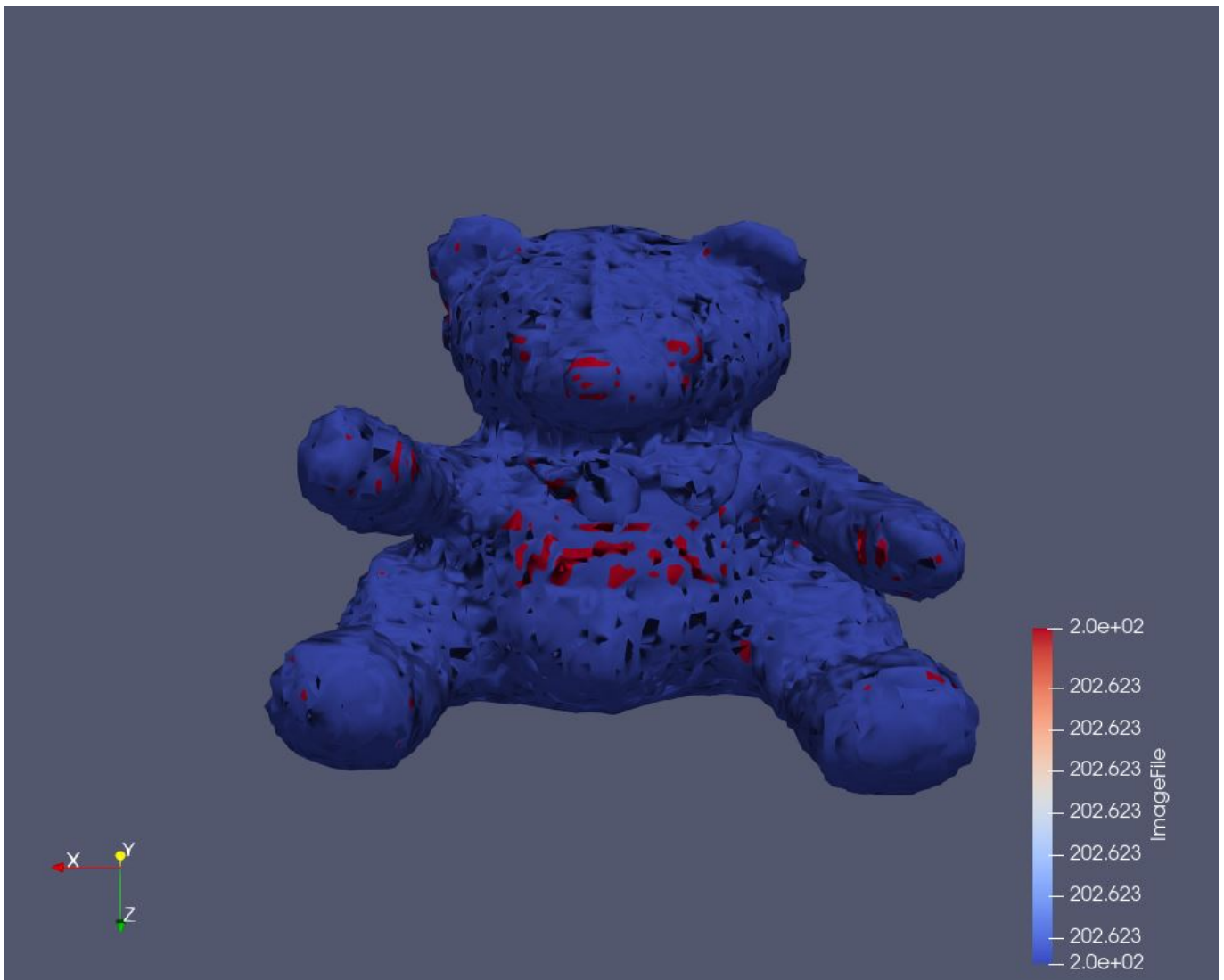
---

Volume Visualization showing narrowed down or filtered view of the hidden data(teddy bear) using marching cubes.

## Visualization

---




3D render of an object(teddy bear) with volume/density map



## Visual Mappings

---

Legends

Mapping	Range
High	
Medium	
Low	

## Data Preparation

---

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

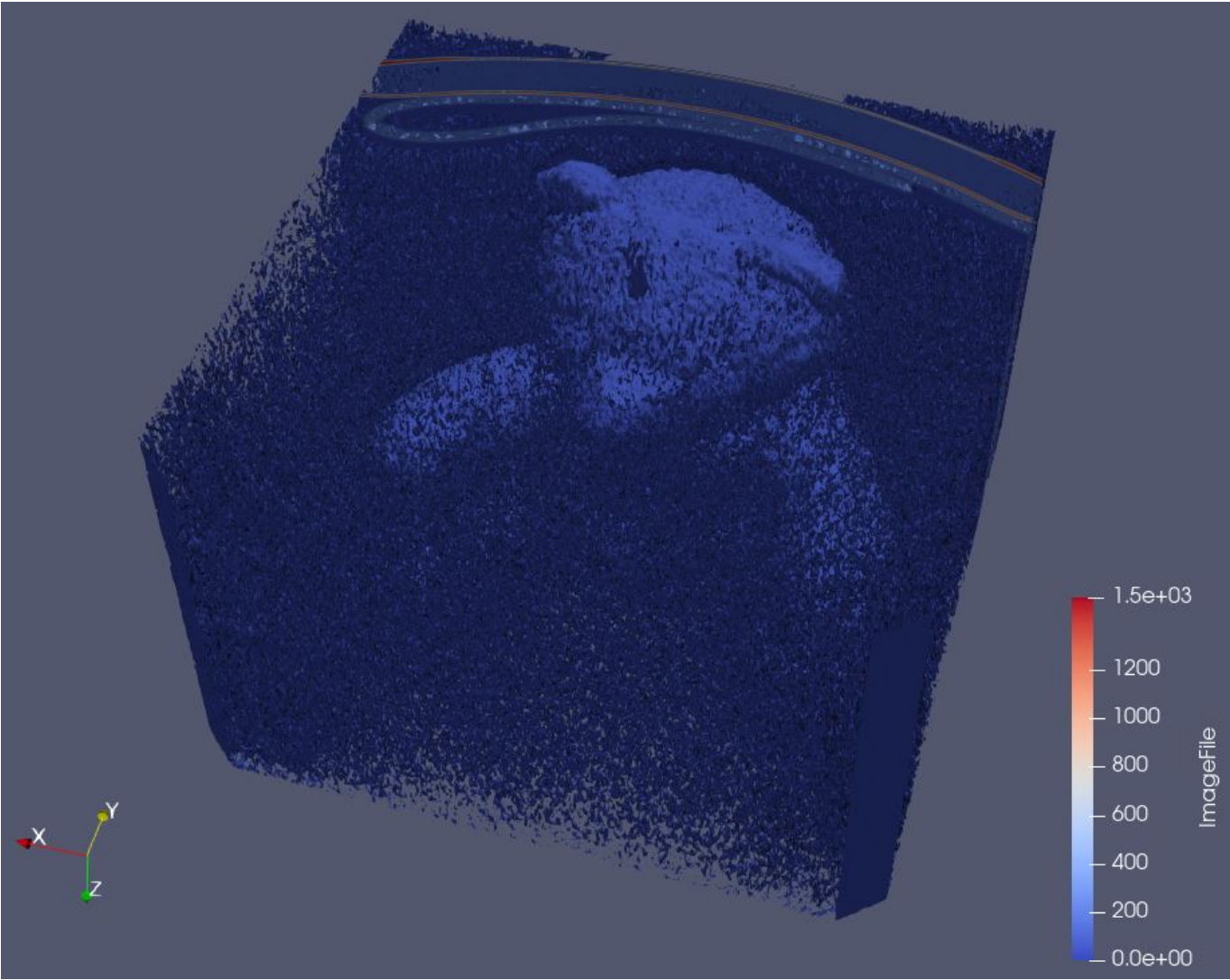
1. Load the dataset and specify the Data Extent in properties window with representation as "Surface".  
The values used for Data Extent as listed below.

Property	Value:
X	511
Y	511
Z	62

2. We apply the **Contour filter** to find the iso surfaces in the dataset with a **Linear Series** of **10 data points** with range **[0,1492]**, however this would result in a very noisy result which need to be filtered further. A short summary below of the setting is below.

Property	Value
Sample size	10
Range	0 - 1492
Type	Linear
Compute Normals	Y
Compute Gradients	N
Compute Scalars	Y
Compute Triangles	Y
Representation	Surface

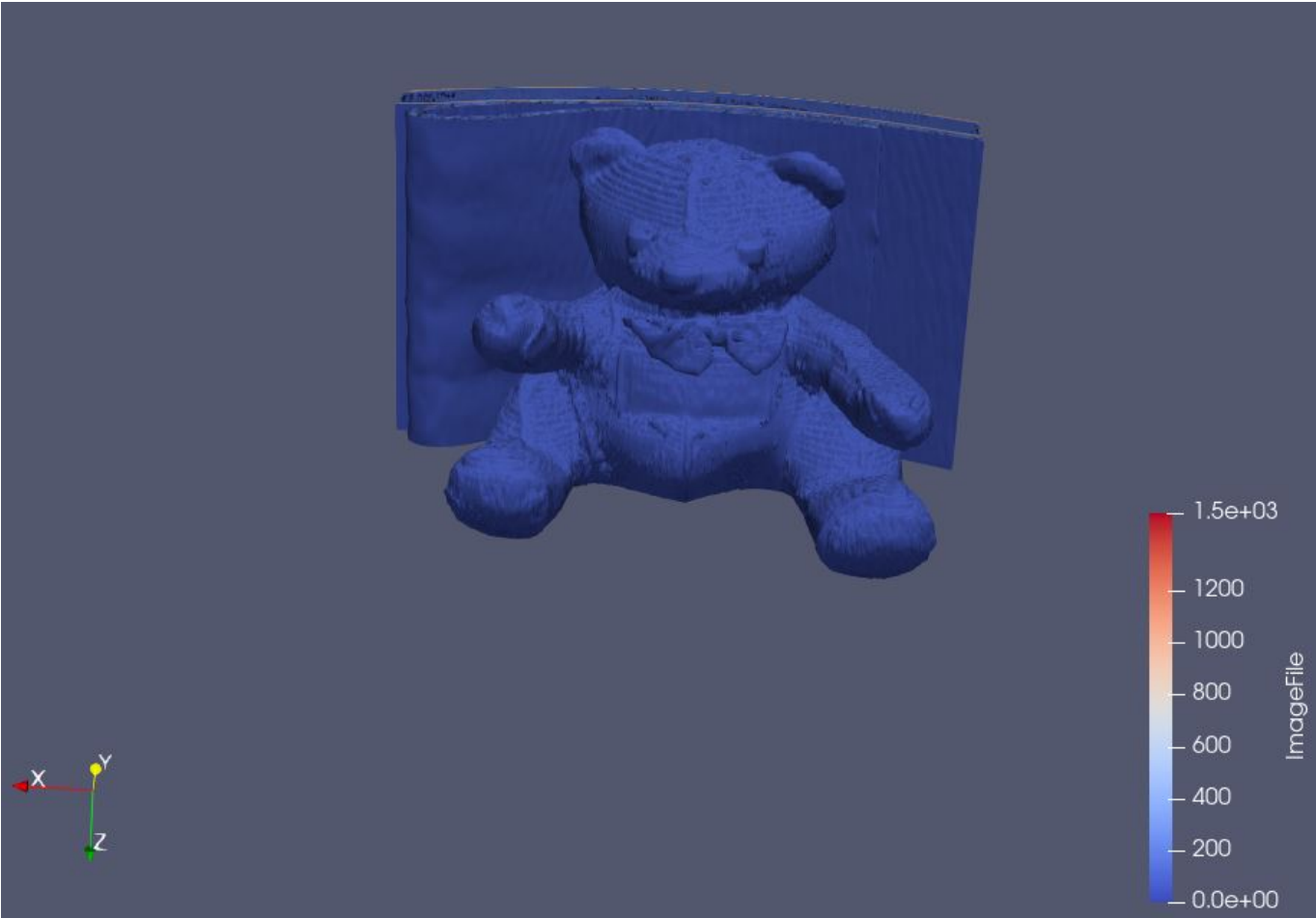
This resulted in the below image



3. Next we apply the **Threshold filter** to find out the scalar which lie in the range(50-1000), this parameter needs to be selected carefully yo obtain the desired result.

Property	Value
Scalars	ImageFile
Minimum	50
Maximum	1000
All Scalars	Y
Use Continious Cell Range	Y
Invert	N
Representation	Surface

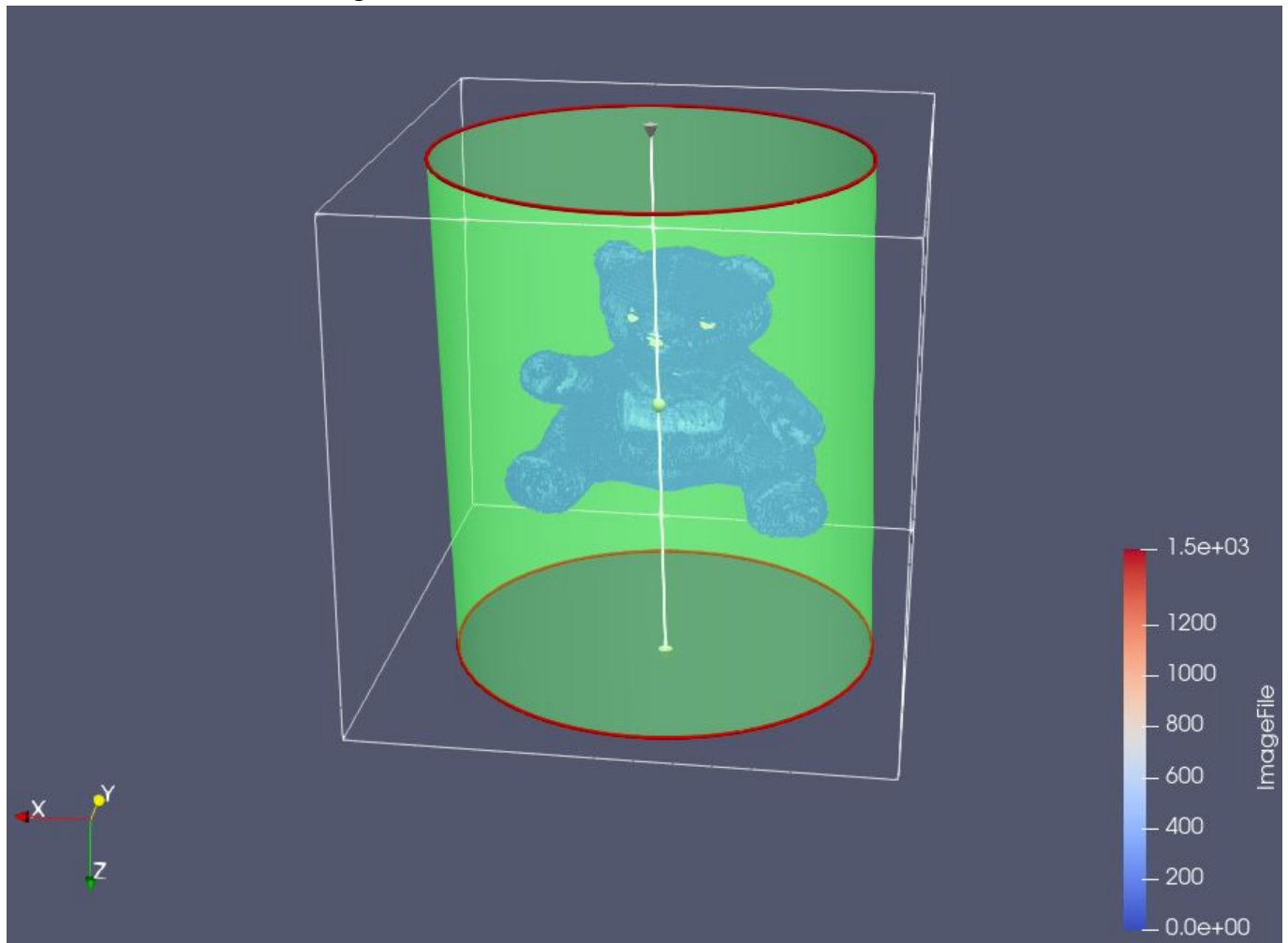
This resulted in the below image



4. Once we have the clear picture of the hidden object in the dataset, we apply a **Clipping filter** along the **z-axis** to clip out the obejct from background. Leaving the needed datat to visualize the subject. We used a **Cylindrical clip** type oriented in a manner to extract the desired data from the dataset.

Property		Value
Clip type		Cylinder
Parameters	Center	(241.99, 168.68, 147.55)
	Axis	(-0.029,0.009,0.999)
	Radius	258.693
Invert		Y
Crinkle Clip		N

This resulted in the below image



## Improvements

---

1. This visualization is limited to the representation of object in the dataset. It can be improved with addition of pressure and stress values at points which can be visualized along the dataset to provide a better visualization.
2. There are no distinctive results that can be inferred from dataset, perhaps having a more colourful image would have better inferences and be more appealing.
3. We have ignored the back side of the object, it appears to be some sort of plane on which the object was placed, it could be explored more to find interesting inferences.