

# CSCM37: Coursework 2

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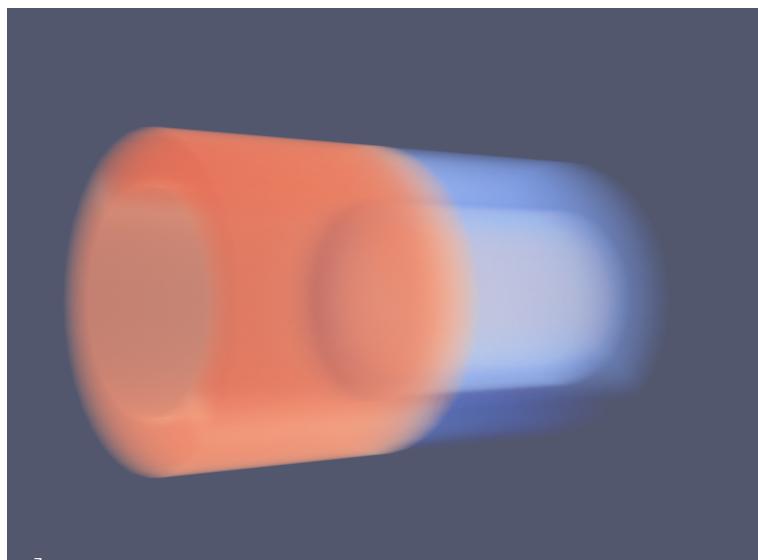
07/04/2020

youTube link: [https://www.youtube.com/watch?v=69kix5Kn\\_KY](https://www.youtube.com/watch?v=69kix5Kn_KY)

## Part 1

### Description

Image:



Tool:

Paraview.

Visual Mappings:

- **Mapping 1:**

The lowest data point 234.336 is set to 0.00 opacity and with a colour blue. The colour blue is then mapped to data point 1462.685 and

opacity of 0.592. The third blue data point is at data point 3163.474 and opacity of 0.474.

- **Mapping 2:**

The red colour mapping starts at data point 5289.462. The first red mapping is at data point 6218.597 with an opacity of 0.828, and the final data point, 10344.588, being mapped deepest red with an opacity of 0.992.

- **Mapping 3:**

Colour space used is Diverging and a nan opacity of 1.

**Data Conversion:**

Representation of the object is set to Volume.

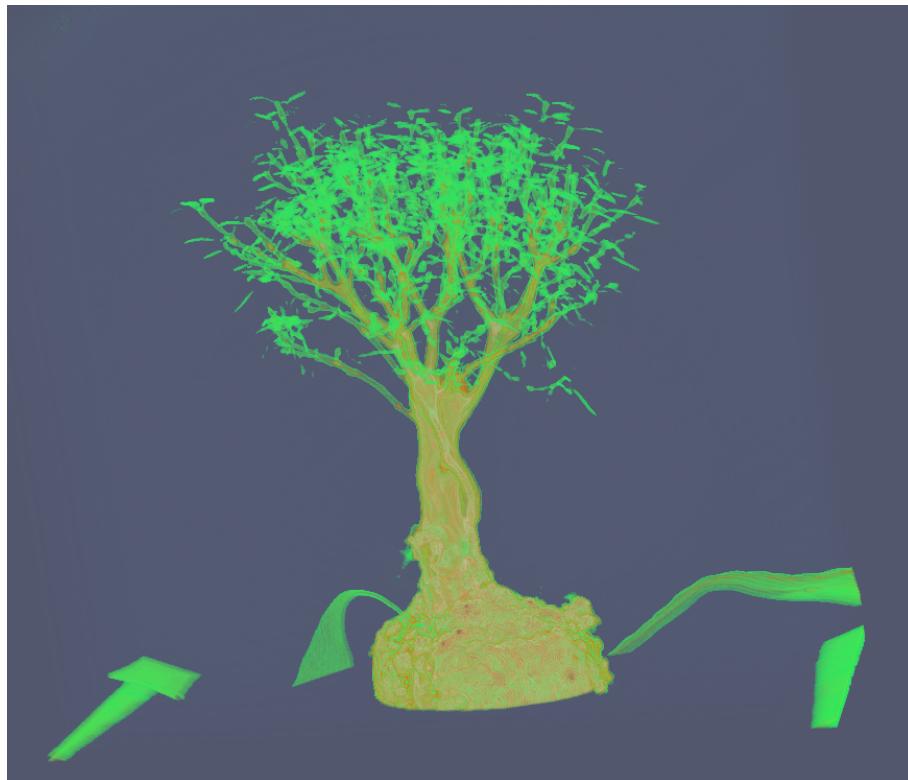
**Unique Observation:**

The visualisation depicts a cylinder, which is half hollow.

## Part 2, Image 1

### Description

Image:



Tool:

Paraview

Visual Mappings:

- **Mapping 1:**

Between data points 0.000 and 37.336, the opacity has been set to 0.000. At 38.336, the opacity has been assigned a value of 0.710, and this has been given a green colour, this is to get the leafs a green colour, and then goes back down to 0.000 opacity at data point 53.2243. While shooting up to data point 65.935 with an opacity of 0.208, then to data point 65.936 at opacity 0.664 with a reddish-brown colour assigned, this is to give the trunk of the tree a colour closely related to brown, this is more the outer layer of the tree trunk. Datapoint 89.766 assigned a green colour again with an opacity of 0.362, with an incline in opacity at data points 109.626 and 150.935, which have been assigned a deep drown colour having the values 0.505

and 0.731 in opacity, again to give the trunk an appearance of a brown colour. These are the more inner layers of the trunk. With then a slight decrease in opacity at data point 255.000 with an opacity of 0.000.

- **Mapping 2:**

LAB colour space used with a max opacity of 1. A colour discretion has been used with a number of tables set to 256.

**Data Conversion:**

Data scalar type unsigned char was used. Along with data extent: 0 - 511, 0 - 511, 0 - 181. Representation is set to volume with a volume rendering of OSPRay based and a blend mode of composite being used. File dimensionality is set to 3 and data byte order is set to BigEndian.

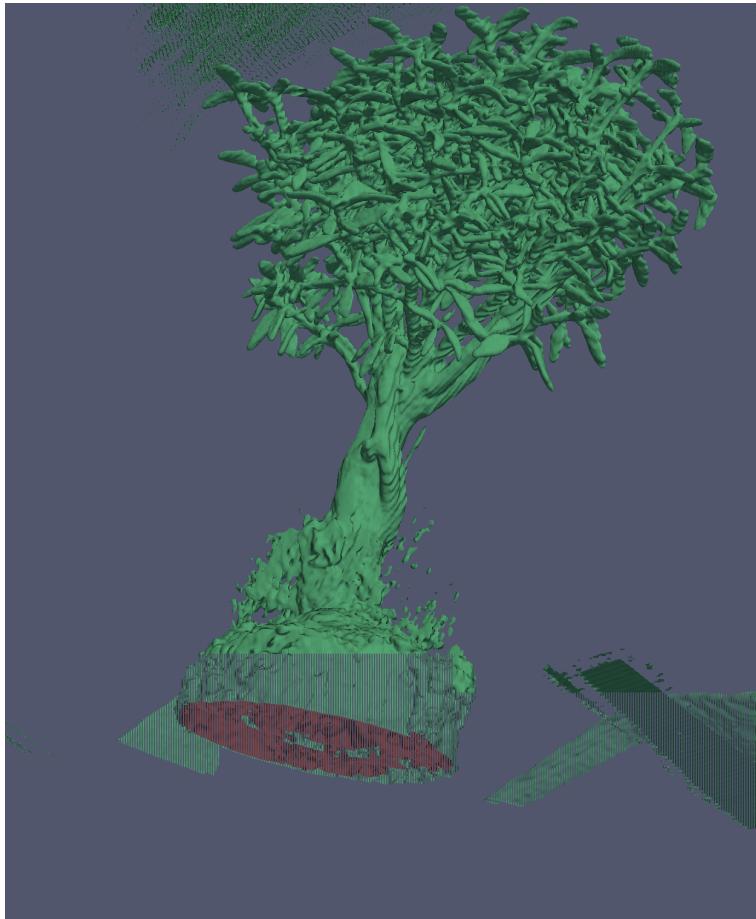
**Unique Observation:**

Once the mapping has been altered a tree with leaves appears. With the colour brown assigned to the trunk of the tree and green assigned to the leaves.

## Part 2, Image 2

**Description**

**Image:**



**Tool:**

Paraview

**Visual Mappings:**

- **Mapping 1:**

Colour mapping is set to LAB.

- **Mapping 2:**

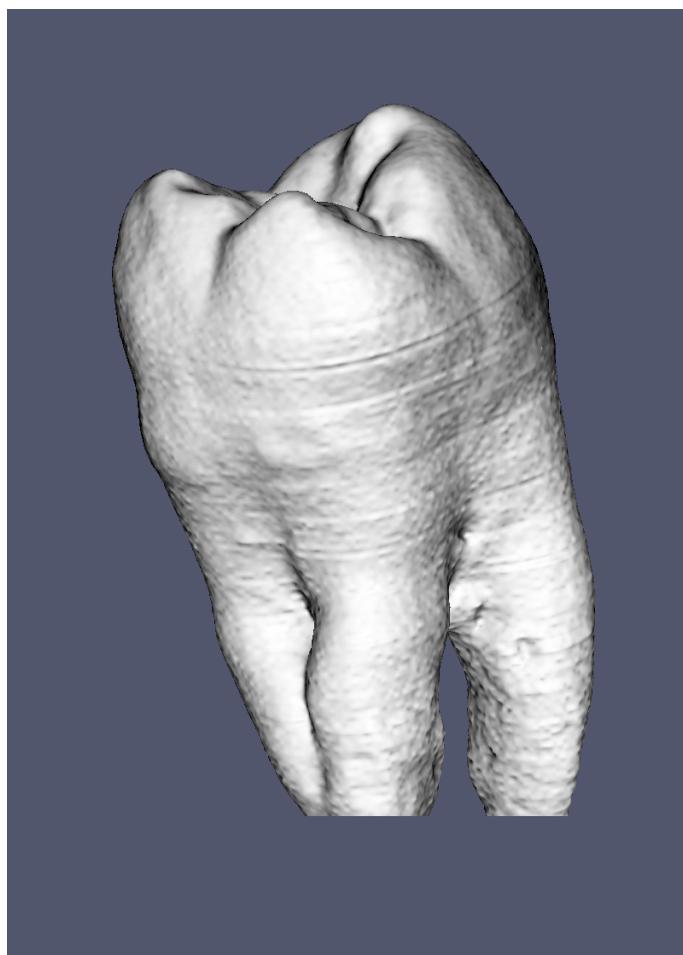
Data point 128.692 has been set to brown with an opacity of 0.608, while datapoint 27 has been set to green with an opacity of 0.000.

**Data Conversion:**

Data scalar type unsigned char was used. Along with data extent: 0 - 511, 0 - 511, 0 - 181. Representation is volume. Data byte order is BigEndian with a file dimensionality of 3. Ray tracing rendering has been enabled, with an OSPRay raycaster set and the blend mode is Isosurface. Value ranges in the volume rendering have been set to 127.5 and 27.

**Unique Observation:**

The inside of the tree trunk is at value 127.5, which is depicted in the brown colour in the image. However, the other layer of the tree, with the leaves are at value 27 show green on the visualisation. When using an Isosurface blend mode, opacity does not have an effect on how to colour is represented in the visualisation.

**Part 2, Image 3****Description****Image:****Tool:**

Paraview

### **Visual Mappings:**

- **Mapping 1:**

Colour is set to X-ray with a colour space of RGB and a nan opacity of 1.

- **Mapping 2:**

At data point 650 the colour mapping starts at white with an opacity of 0.000, with a linear increase to 1300.00 at opacity 1.000. At data point 1160.642, this is where the change from white to black happens.

### **Data Conversion:**

Data scalar type unsigned short was used with a representation of volume used. Volume rendering was set to OSPRay Based and a blend mode set to Isosurface. Data extent: 0 - 511, 0 - 511, 0 - 181 was used and data byte order of BigEndian.

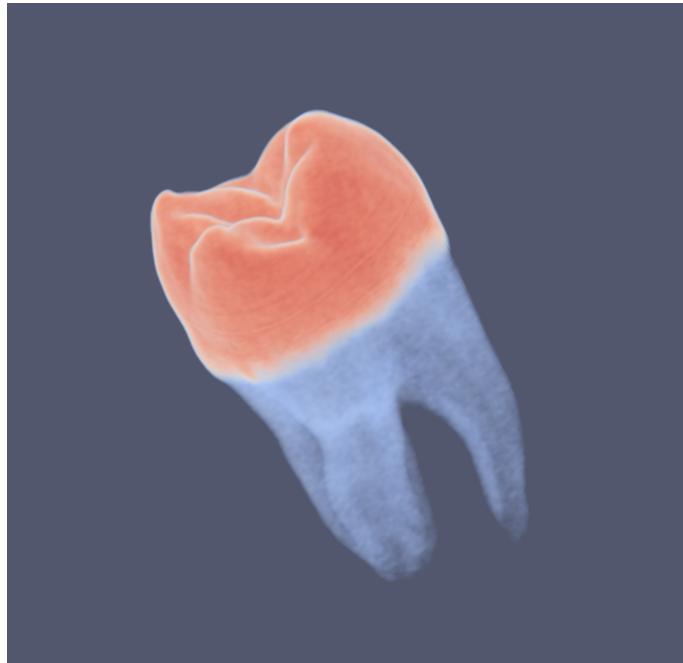
### **Unique Observation:**

A full tooth and roots are displayed with the tooth bite grooves. The data value 650 shows the outside Isosurface layer that creates the outside layer of the tooth.

## **Part 2, Image 4**

### **Description**

### **Image:**



**Tool:**

Paraview

**Visual Mappings:**

- **Mapping 1:**

The colour preset for the colour mapping is cool to warm. At data point 596.390 to 787.088, the opacity is 0.000, and this is assigned the darkest part of the blue. At 787.088 the opacity line goes up linearly to 100.000 at data point 1300.000, which has the deepest red value. At data point 948.195 is where the white colour value has been assigned.

- **Mapping 2:**

The colour space is set to diverging, and the nan opacity is set to 1. The colour discretion is set to a value of 256 number of table values.

**Data Conversion:**

Data scalar type unsigned short was used with a representation of volume used. Volume rendering was set to smart, and a blend mode of Composite is selected. Data extent: 0 - 511, 0 - 511, 0 - 181 was used and data byte order of BigEndian.

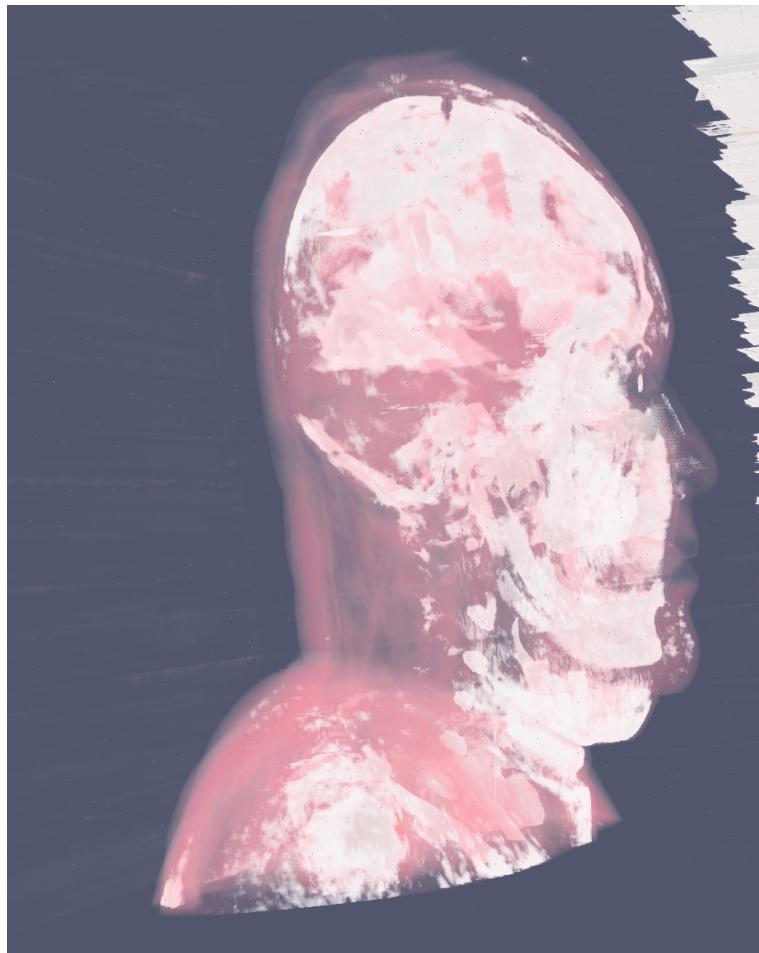
**Unique Observation:**

At datapoint 948.195 is where the transition from the root to the actual tooth. This is the white stripe in the image.

## Part 3, Image 1

### Description

Image:



Tool:

Paraview

Visual Mappings:

- **Mapping 1:**

Pink colour has been assigned to the skin, at data point 157.199 and opacity of 0.013, and white colour has been assigned to the bones, at data point 188.639 with an opacity of 0.562.

- **Mapping 2:**

Colour preset was originally cool to warm but has been modified.

Colour space diverging has been used with nan opacity to 1.

**Data Conversion:**

Data spacing used is 1, 1, 4 with a representation of volume has been used. The volume rendering is using OSPRay based with a blend mode of Composite.

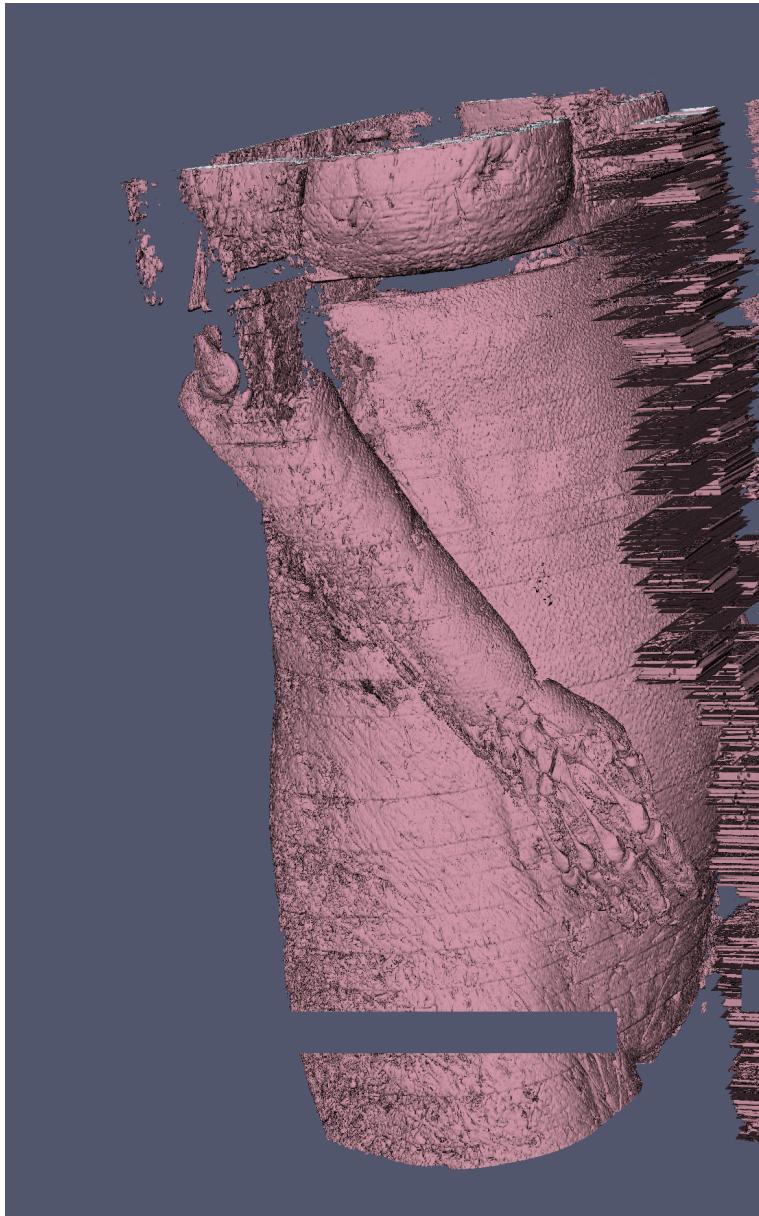
**Unique Observation:**

This scan shows a person's head. At data point 188.639 is where the visualisation holds the information for the bones, showing white, and at data point 157.199, is where the skin of the person is. So this shows how the person's bones look under their skin. There is a lightly transparent layer of skin over the top. There seems to be some excess fat in the person's chin.

## Part 3, Image 2

**Description**

**Image:**



**Tool:**

Paraview

**Visual Mappings:**

- **Mapping 1:**

Between data points 67.972 - 210.121 a pink colour has been assigned, to map to the skin with an opacity of 0.000. However, the opacity

has no effect on the Isosurface image. While the values 220.000 to 395.686 have been assigned a white value, as with the data conversion is in composite, the bones are assigned a white colour with an opacity of 0.726.

- **Mapping 2:**

Colour preset was originally cool to warm but has been modified.  
Colour space LAB has been used with nan opacity to 1.

**Data Conversion:**

Data spacing used is 1, 1, 4 with a representation of volume. The volume rendering is using OSPRay based with a blend mode of Isosurface. The value range is set to 200.

**Unique Observation:**

This scan shows a female's abdomen from the chest to the top of the legs. At data point 127.5, all of the person's skin is shown, but if you assign the range value to data point 200, this is where the visualisation shows the skin but also allows the hand, elbow and forearm bones show through.