Visualization - Lab 2

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1 Visualization using Clip

The first part of the lab was to create a visualization using an IsoVolume and Clip filter.

The values from lab 1 was tweaked slightly to achieve a similar

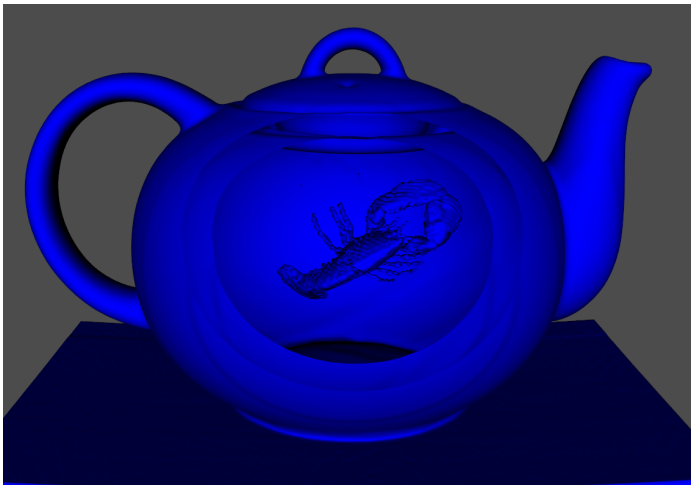

Figure 1:

2 Visualization using Contour

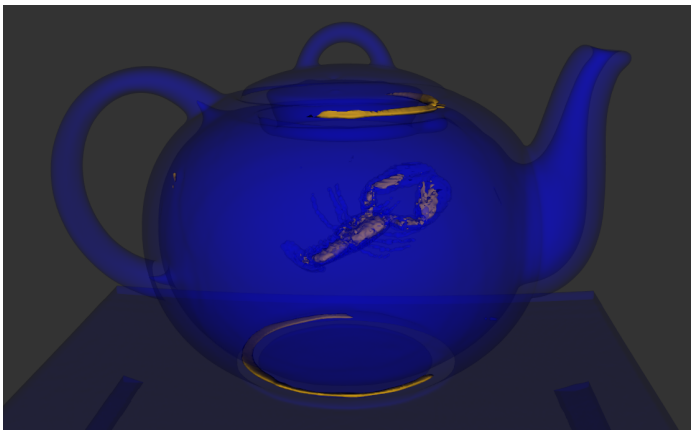

Figure 2: The teapot visualized using contour with values 30 (blue) and 130(yellow) along with an opacity value of 0.2 to see the lobster inside.

Appendix A Clip visualization code

```
import vtk

# Read raw dataset
reader = vtk.vtkImageReader()
reader.SetFileName("../dataset/BostonTeapot.raw")
reader.SetDataByteOrderToBigEndian()
reader.SetNumberOfScalarComponents(1)
reader.SetFileDimensionality(3)
reader.SetDataExtent(0, 255, 0, 255, 0, 177)
reader.SetDataScalarTypeToUnsignedChar()
reader.Update()

contour = vtk.vtkContourFilter()
contour.SetInputConnection(reader.GetOutputPort())
contour.GenerateValues(2, 30, 255)


plane = vtk.vtkPlane()
plane.SetOrigin(160, 150, 140)
plane.SetNormal(0.0, -0.35, -0.9)

clipper = vtk.vtkClipPolyData()
clipper.SetInputConnection(contour.GetOutputPort())
clipper.SetClipFunction(plane)
clipper.SetValue(0)
clipper.Update()

mapper = vtk.vtkDataSetMapper()
mapper.SetInputConnection(clipper.GetOutputPort())

actor = vtk.vtkActor()
actor.SetMapper(mapper)
actor.GetProperty().SetColor(1.0, 1.0, 1.0)

renderer = vtk.vtkRenderer()
renderer.SetBackground(0.3, 0.3, 0.3)
renderer.AddActor(actor)

render_window = vtk.vtkRenderWindow()
render_window.SetWindowName("teapot")
render_window.SetSize(800, 800)
render_window.AddRenderer(renderer)

interactor = vtk.vtkRenderWindowInteractor()
interactor.SetRenderWindow(render_window)
interactor.Initialize()
interactor.SetInteractorStyle(vtk.vtkInteractorStyleTrackballCamera
    ())
render_window.Render()
interactor.Start()
```

Appendix B Contour visualization code

```
import vtk

# Read raw dataset
reader = vtk.vtkImageReader()
reader.SetFileName("../dataset/BostonTeapot.raw")
reader.SetDataByteOrderToBigEndian()
reader.SetNumberOfScalarComponents(1)
reader.SetFileDimensionality(3)
reader.SetDataExtent(0, 255, 0, 255, 0, 177)
reader.SetDataScalarTypeToUnsignedChar()
reader.Update()

contour1 = vtk.vtkContourFilter()
contour1.SetInputConnection(reader.GetOutputPort())
contour1.GenerateValues(2, 0.0, 30)

mapper1 = vtk.vtkPolyDataMapper()
mapper1.SetInputConnection(contour1.GetOutputPort())

actor1 = vtk.vtkActor()
actor1.SetMapper(mapper1)
actor1.GetProperty().SetColor(1.0, 1.0, 1.0)
actor1.GetProperty().SetOpacity(0.2)

contour2 = vtk.vtkContourFilter()
contour2.SetInputConnection(reader.GetOutputPort())
contour2.GenerateValues(2, 0.0, 130)

mapper2 = vtk.vtkPolyDataMapper()
mapper2.SetInputConnection(contour2.GetOutputPort())

actor2 = vtk.vtkActor()
actor2.SetMapper(mapper2)
actor2.GetProperty().SetColor(1, 0.75, 0)
actor2.GetMapper().ScalarVisibilityOff()

renderer = vtk.vtkRenderer()
renderer.SetBackground(0.3, 0.3, 0.3)
renderer.AddActor(actor1)
renderer.AddActor(actor2)

render_window = vtk.vtkRenderWindow()
render_window.SetWindowName("teapot")
render_window.SetSize(800, 800)
render_window.AddRenderer(renderer)

interactor = vtk.vtkRenderWindowInteractor()
interactor.SetRenderWindow(render_window)
interactor.Initialize()
interactor.SetInteractorStyle(vtk.vtkInteractorStyleTrackballCamera
    ())
render_window.Render()
interactor.Start()
```