

# Information Visualization

W15: Exercise - Implementation of Volume Rendering 2

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# Schedule

- W01 4/11 Guidance
- W02 4/12 Setup
- W03 4/18 Introduction to Data Visualization
- W04 4/19 CG Programming
- W05 4/25 Rendering Pipeline
- W06 4/26 Coordinate Systems and Transformations
- W07 5/09 Shading
- W08 5/10 Shader Programming
- W09 5/16 Visualization Pipeline
- W10 5/17 Data Model and Transfer Function
- W11 5/23 Scalar Data Visualization 1 (Isosurface Extraction)
- W12 5/24 Implementation of Isosurface Extraction
- W13 5/30 Scalar Data Visualization 2 (Volume Rendering)
- W14 5/31 Implementation of Volume Rendering 1
- W15 6/06 Implementation of Volume Rendering 2

# Final Task

- Develop a volume visualization application and explain its characteristics.

# Application Examples 1

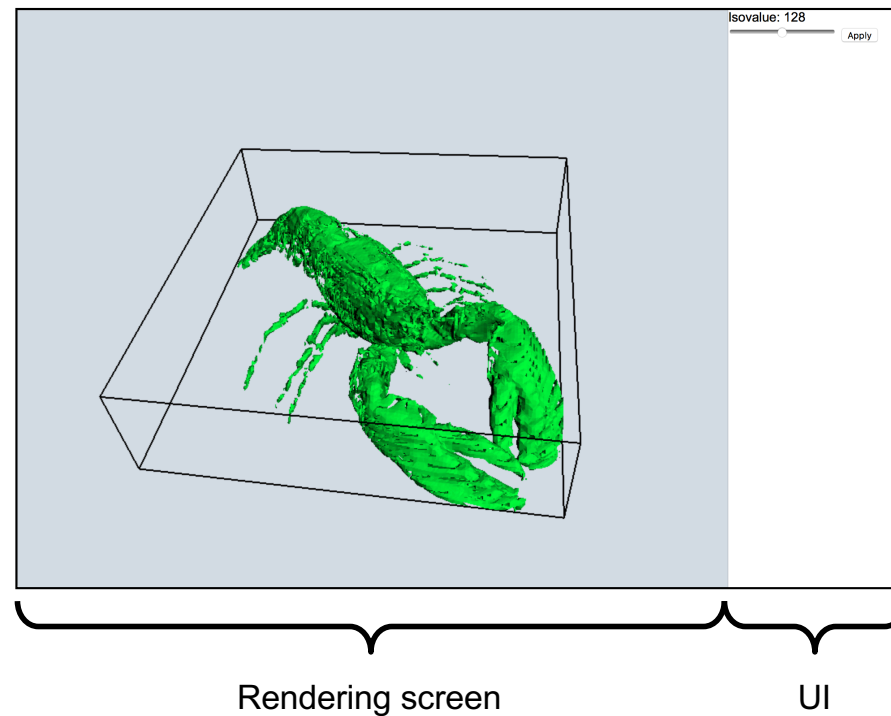
- Isosurface application
  - Implement user interface for changing isovalue
  - Implement user interface for changing transfer function
  - Remove duplicated vertices for phong shading
  - Integrate with slice planes
  - ...

# Application Examples 2

- Volume rendering application
  - Enable shading effects
  - Improve rendering performance
  - Implement user interface for changing transfer function (opacity values)
  - Apply to the Loabster data
  - Integrate with isosurfaces and slice planes
  - ...

# Tips (1/3)

- Dividing the window into the rendering screen region and the user interface region



## Tips (2/3)

- Dividing the window into the rendering screen region and the user interface region
  - HTML file

```
<div id="display" style="width: 80%; float: left;"></div>
<div id="controller" style="width:20%; float:left;">
  <label id="label" style="font-family:Arial;"></label>
  <input type="range" min="0" max="1" step="0.01" value="0.5"
id="isovalue"/>
  <button id="change-isovalue-button" style="font-family=Arial;">
Apply</button>
</div>
```

# Tips (3/3)

- Dividing the window into the rendering screen region and the user interface region
  - JS file

```
screen.init(volume, {  
    width: window.innerWidth * 0.8,  
    height: window.innerHeight,  
    targetDom: document.getElementById('display'),  
    enableAutoResize: false  
});  
  
...  
  
window.addEventListener('resize', function() {  
    screen.resize([ window.innerWidth * 0.8, window.innerHeight ]);  
});
```



# Polling

- Take the poll
  - Student ID Number
  - Name
  - URL to Application
  - URL to Document (PDF)