AVANGO

A Display Device Abstraction for Virtual Reality Applications

Display Device Abstraction

- Great variety of display devices
  - Monitor
  - Workbench
  - Head-mounted display
  - CAVE

- Performance
- Ease of use
# Devices

<table>
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<tr>
<th></th>
<th>Mono</th>
<th>Stereo</th>
<th>One Screen</th>
<th>Multi Screen</th>
<th>Dynamic Frustum</th>
<th>Static Frustum</th>
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<tbody>
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<td>Monitor</td>
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<tr>
<td>Stereo Monitor</td>
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<td>Workbench</td>
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<td>Head-mounted Display</td>
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<td>CAVE</td>
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## Device Representation

- Eye
- Screen
- View
  - MonoView
  - StereoView
- Window
  - MonoWindow
  - StereoWindow
**Eye**

- Scene graph node
- Determines camera position
- Defines near and far clipping planes

**Screen**

- Scene graph node
- Determines position and orientation of projection screen
- Size on local XZ-coordinate plane
View

- Associates Eye- and Screen-Node(s) with Window-Objects
- Calculates view frustum using
  - Position of eye node
  - Position and orientation of screen node
- CULL optimization for stereo views

Window

- Specifies graphics output window
  - Position and Size on graphics screen
  - View port
Class Diagram

Monitor
Head-mounted Display

CAVE
Conclusion

- Display device abstraction
- Few components
- Fits most common devices
- Implicit frustum definition
- Scene graph integration
- Performance optimizations
- Scriptable