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FOCUS + CONTEXT

Papers


Field Study
• Interviewed fourteen experts
• Multi-scale content:

<table>
<thead>
<tr>
<th>Task</th>
<th>Static Graphic Design</th>
<th>Static Chip Design</th>
<th>Dynamic Air Traffic Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document</td>
<td>Poster: 1m</td>
<td>Water: 12cm</td>
<td>Zone: 50km</td>
</tr>
<tr>
<td>Smallest Object</td>
<td>Text: 1cm</td>
<td>Conductive Path: 3mm</td>
<td>Airplane. 50m</td>
</tr>
<tr>
<td>Smallest Detail</td>
<td>Align: 0.5mm</td>
<td>Grid 0.5µm</td>
<td>25m steps</td>
</tr>
<tr>
<td>Ratio</td>
<td>2,000</td>
<td>240,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Static Data Study
• Circuit board
  • Path tracing
  • Verify connected pairs of pins
• Map of London distance comparison
  • Hotels and conference location marked
  • Which one is closer by taxi?

Evaluation of Semantic Fisheye Zooming to Provide Focus + Context.

Results
• Focus + Context 21% and 36% faster and also preferred by the majority
• Overview + Detail slower due to switching views
• Problems noted:
  • Context not very usable, too blurry
  • Users cast shadows on display

Visual Understanding Environment (VUE)
• Concept map application for the classroom
• Digital Library Objects connected by user defined relations
• Canvas for drawing and creating objects

Dynamic Data Study
• Only overview + detail and focus + context
• Driving simulation
  • Subjects had to avoid rocks (in context) and nails (in focus)
  • Focus + context had one third of the obstacles hit, and it was preferred
  • Peripheral vision used

Problems
• Difficult to view concept maps larger than dozens of nodes
• Using geometric zooming...
  • Removes context
  • Nothing added by zooming, nodes just get larger (not semantic)
  • Must instead look at detail in another window

Solution
• Semantic Fisheye Zoom
  • Activated by mouse over, gives detail that would otherwise be in a popup window

Study
• Compared semantic fisheye zoom to control interface (normal zoom)
  • Expected new zoom to:
    • Be faster to use
    • Be preferred
    • Allow for remembering more information
  • Did not expect higher accuracy

Setup
• Students answered 3 question sets while using interface:
  1. Questions involving a single node
  2. ...two or more nodes
  3. ...an overall understanding of the concept map
• 4th question set answered without interface (by memory)

Results
• Significant: Control faster in set 1
• Accuracy in Set 4 was higher for fisheye
  • Better learning of information
  • No need to integrate across displays
Critique
- Builds upon previous studies
  - Makes modest assumptions
  - Study performed like real world use
- How was preference for semantic fisheye zoom reported?
- How many nodes were in the graph?

An Improved Fisheye Zoom Algorithm for Visualizing and Editing Hierarchical Models

ADORA
- Eclipse plugin
- Analysis and Description of Requirements and Architecture
- Object oriented modeling method, display as nested hierarchy
- Demo

Algorithm Properties
- Commutative zoom operations
- Preserve the mental map
  - Orthogonality ordering
  - Proximity relations
  - Topology


Interval Structure
- Commutative
  - Intervals remembered and have minimum size

Multipurpose
- Add and remove done using algorithm
  - Add as large as possible, then expand
- Zoom out to pixel, then remove
- Resize and move done using remove and then add
- Filtering (Show/Hide) remember position

Critique
- Flexible and powerful, but could collect large amounts of intervals over time
- Moving multiple nodes - weird behavior
  - Demo
- Has Table Lens like reaction to zooming when many nodes are lined up
  - Demo

Questions?