Papers


Interfaces
Field Study

- Interviewed fourteen experts
- Multi-scale content:

<table>
<thead>
<tr>
<th>Task</th>
<th>Graphic Design</th>
<th>Chip Design</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document</td>
<td>Poster: 1m</td>
<td>Wafer: 12cm</td>
<td>Zone: 50km</td>
</tr>
<tr>
<td>Smallest Object</td>
<td>Text: 1cm</td>
<td>Conductive Path: 3µm</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?
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
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
Critique

- Innovative method of combining display techniques to make focus + context

- Tasks intelligently chosen and strong results supporting focus + context

- Are results useful in the future when it will be easier to have full screen at high res?
Evaluation of Semantic Fisheye Zooming to Provide Focus + Context.
Visual Understanding Environment (VUE)

- Concept map application for the classroom
- Digital Library Objects connected by user defined relations
- Canvas for drawing and creating objects
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

- Justified by earlier work:
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

- 4\textsuperscript{th} 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

http://www.ifi.uzh.ch/rerg/research/projects/adora/
Algorithm Properties

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

Interval Structure

Figure 2. 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?