Interaction & Navigation

• Focus + context, overview & detail
  – Discussed already!
• Dynamic queries
• Brushing & Linking
• Zooming
• 3D Navigation
The yellow dots above are homes in the DC area for sale. You may get more information on a home by selecting it.

You may drag the 'A' and 'B' distance markers to your office or any other location you want to live near.

Select distances, bedrooms, and cost ranges by dragging the corresponding slider boxes on the right.

Select specific home types and services by pressing the labeled buttons on the right.
Ahlberg & Shneiderman, Color plate 1. The FilmFinder.
Ahlberg & Shneiderman, Color plate 2. Categories have been selected, the displayed is zoomed
Dynamic Periodic Table Of Elements

<table>
<thead>
<tr>
<th>Atomic Mass (u)</th>
<th>Ionic Radius (pm)</th>
<th>Ionization Energy (eV)</th>
<th>Electronegativity (x10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>260</td>
<td>25</td>
<td>60</td>
</tr>
</tbody>
</table>

Max
Min
Hover Queries

• Faster than mouse clicks
• Allows rapid scanning

[www.infovis.net]
Object Size

- Quicker to navigate to large objects (Fitts’ Law)
- But can display more small objects
Highlighting (Focusing)

Focus attention on a subset of the data
(from Wills 95, Visual Exploration of Large Structured Datasets)

[www.sims.berkeley.edu/courses/is247/s02/lectures/Lecture3.ppt]
Brushing & Linking
Baseball data (from Wills 95)

- how long in majors
- avg assists vs avg putouts (fielding ability)
- distribution of positions played
- select high salaries
- avg career HRs vs avg career hits (batting ability)

[www.sims.berkeley.edu/courses/is247/s02/lectures/Lecture3.ppt]
Linking types of assist behavior to position played (from Wills 95)

[www.sims.berkeley.edu/courses/is247/s02/lectures/Lecture3.ppt]
Zooming

• Can be fast & effective way to navigate
  – Must be able to zoom rapidly
• Standard zooming
  – hard to make intuitive zoom-out control
• Semantic zooming
  – Different representations at diff scales

• Example: Pad++, Autozoom
Fig. 4. Example of the multi-window condition with two windows created. One window is focused on the sample set, while the other is focused on its match.
Map Design

- Landmarks
- Overview
  - Overview window
  - Rapid zooming
- View direction
  - North up with direction of travel
  - Track up

These ideas also apply to abstract information displays!
3D Navigation

- World in hand / Eyeball in hand
- Walking / Flying

- Egocentric vs. Exocentric