Expanding Selection for Information Visualization Systems on Tablet Devices

Ramik Sadana, John Stasko
Graham Wills, “524,288 ways to say ‘this is interesting’”, InfoVis 1996
Replace Selection
Add to Selection
Remove from Selection
Intersect with Selection
Toggle Selection
Ramik Sadana, John Stasko “Designing Multiple Coordinated Visualizations for Tablets”, EuroVis 2016
In the past ...
Benko et al., “Precise Selection Techniques for Multi-Touch Screens”, CHI ’06

Moscovich, “Contact Area Interaction with Sliding Widgets”, UIST ’09

Au et al., “LinearDragger: A Linear Selector for One-finger Target Acquisition”, CHI’14
Wobbrock et al., “User defined gestures for surface computing”, CHI’14
Wobbrock et al., "User defined gestures for surface computing", CHI'14
North et al., “Understanding multi-touch manipulation for surface computing”, INTERACT’09
Research Challenge

How can we provide advanced selection features within tablet-based visualization systems?
Driving Scenarios …
1. Compound Query
1. Compound Query
1. Compound Query

Diagram showing a scatter plot with axes for Budget and Year. Different colored dots represent different genres: red for Comedy, blue for Action, brown for Drama, and green for Horror. The scatter plot is color-coded to show the distribution of genres across budget and year.
1. Compound Query

![Graph showing points representing different genres over budget and year.]

- Action
- Comedy
- Drama
- Horror
2. Brushing and linking
2. Brushing and linking
2. Brushing and linking
2. Brushing and linking
3. Imprecision of Touch
3. Imprecision of Touch

Occlusion
Designing a Solution ...
Marking Menus
Touch Overloading
Modifier + Existing Interaction
Non-dominant Hand
Wagner et al., “**BiTouch and BiPad: Designing Bimanual Interaction for Hand-held Tablets**, CHI’12

Li et al., “**Experimental Analysis of Mode Switching Techniques in Pen-based User Interfaces**, CHI’05
Control selector
Control selector
Modifier
1 bit
Clutch
Mapping Clutch ...
Clutch + Tap
Clutch + Drag
Clutch + Pinch
Clutch + Drag + Pinch
Low-tension Clutch
Replace Selection
Add to Selection
Remove from Selection
Intersect with Selection
Toggle Selection
Generalized Selection
Generalized Selection
Budget

Avatar
Generalized Selection

Budget

Year
Generalized Selection

Budget

Year

Avatar
Generalized Selection

Budget

Avatar

Year

<table>
<thead>
<tr>
<th>Genre</th>
<th>Director</th>
<th>Rating</th>
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</thead>
</table>

- Avatar
Heer et al. “Generalized Selection via Interactive Query Relaxation.” CHI ’08
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Generalized Selection
Generalized Selection

Match by

Genre
Director
Rating
Generalized Selection

Match by

Genre
Director
Rating
Generalized Selection

Match by

- Genre
- Director
- Rating
Generalized Selection
Discussion ...
Extensions
Extensions
Extensions
Extensions
Limitations
Limitations

- Discoverability
- Change of Grip
- Evaluation
~thanks~

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