Ch 11: Manipulate View
Papers: Genealogical Graphs
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Papers: Genealogical Graphs
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CPSC 547, Information Visualization
Day 10: 15 October 2015

How to handle complexity: 3 more strategies

1. Navigate: Changing item visibility
   - change viewpoint
   - camera metaphor
     - zoom
     - pan/translate
   - constrained navigation
   - often based on selection set

2. Manage: Processing View
   - slice
   - show only items matching specific value for a given attribute of a data set
   - scope of what is shown
   - middle block stretches to fill space, additional structure appears within
   - other blocks snap down to increase aggregated representations

3. Reorder: Redesigning View
   - stack bars
   - easy to compare
   - first segment
   - total bar
   - align to different segment
   - alignment

Change over time
- change any of the other choices
  - encoding itself
  - parameters
  - arrangement of items
- why change?
  - one of four major strategies
  - change over time
- face data by partitioning into multiple views
- reduce amount of data shown within view
- putting focus + context together
- most obvious, powerful, flexible
- interaction entails change

How to handle complexity: 3 more strategies
+ 1 previous

Idiom: Animated transitions
- smooth transition from one state to another
  - alternative to jump cuts
  - support for item tracking when amount of change is limited
  - example: multilevel matrix views
  - scope of what is shown narrows down
  - middle block stretches to fill space, additional structure appears within
  - other blocks snap down to increase aggregated representations

News
- marks for lectures 6-10 sent out this morning
- reminder: submit 3 separate questions
  - not 2, not 1

Select and highlight
- selection: basic operation for most interaction design choices
  - how many selection types?
    - click vs hover: heavyweight, lightweight
    - primary vs secondary semantics (eg source/target)
  - high/low: change visual encoding for selection targets
    - color
    - interaction: existing color coding hidden
    - other channels (eg motion)
    - add explicit connection marks between items

Idiom design choices: Interaction
- change over time
  - most obvious & flexible of the 4 strategies

Idiom: Semantic zooming
- visual encoding change
  - color
  - sparklines
  - simple line chart
  - full chart: axes and tickmarks

Idiom: Reorder
- data: tables with many attributes
- task: compare rankings

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**Further reading General**

- Tuning and testing scrolling interfaces that automatically zoom. Andy Cockburn, Joshua Savage, Andrew Wallace. Proc. CHI 05.

**Genealogical graphs**

- family tree is a misnomer
  - single person has tree of ancestors, tree of descendants
  - no crossings, nodes ordered by generation
  - doubly rooted: x leftmost descend, y rightmost ancestor
  - no root
  - no spatial ordering for generations

**Dual trees abstraction**

- explore canonical subsets and combinations, easy to interpret, scales well
- no crossings, nodes ordered by generation
- doubly rooted: x leftmost descend, y rightmost ancestor
- from roots from hourglass diagram

**Indented, flipped, combined**

- layered, flipped, combined
- no crossings, nodes ordered by generation
- doubly rooted: x leftmost descend, y rightmost ancestor
- no root
- no spatial ordering for generations

**Layers**

- rooted trees: standard layouts
  - connection
  - containment
  - adjacent aligned position
  - indented position

**Interaction as fundamental to design**

- topological navigation via collapse/expand on selection
  - parents, children
  - expand or trigger rotation
  - collapsing subtree
  - link driven by navigation
  - geometric zoom/pan
  - constrained navigation: automatic camera framing
  - animated transitions
  - 3 phases fade out, move, fade in
  - mouseover hover
  - preview dots expand if collapsed

**Custom widget**

- popup marking menu
  - pick up or down, ballistic
  - subtree drag-out widget

**Next Time**

- to read
  - VAO Ch. 12: Facet into Multiple Views
- one week from today: pitches
  - no reading, think about project and prepare slides
  - 2 minutes each
  - send me your slides by noon Thu
- last week of October: no classes!