Lectures 3&4: Facet into Multiple Views

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Facet into Multiple Views

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Idiom: Linked highlighting
• see how regions contiguous in one view are distributed within another
  – powerful and pervasive interaction idiom
• encoding: different
  – multiform
  – rich: single monolithic view has strong limits on number of attributes that can be shown simultaneously
• data: all shared

System: EDV

Idiom: Juxtapose and coordinate views
• linked views
  – simultaneously visible
  – linked together such that actions in one view affect the others
• encoding: same
• data: subset shared
• navigation: shared
  – bidirectional linking

System: Google Maps

Idiom: bird’s-eye maps
• encoding: same
• data: subset shared
• navigation: shared
  – bidirectional linking
• differences
  – viewpoint
  – (size)
• overview-detail

System: StratomeX

Idiom: Mosaic plots
• encoding: same
• data: all shared
• navigation: shared
  – unidirectional vs bidirectional linking

System: Mondrian

Idiom: Overview-detail
• multiscale: three viewing levels
  – tooling (modern version: p6a.org)
• expand/contract control panes
• expand/contract control dimensions

System: MizBee

Idiom: Parallel sets

System: Pathfinder

Idiom: Small multiples
• encoding: same
• data: none shared
• navigation: shared
  – different attributes for node colors
  – (same network layout)

System: Cerebral
Superimpose layers
- layer: set of objects spread out over region
- each set is visually distinguishable group
- safe special case—animated transitions

Why not animation?
- disparate frames and regions: comparison difficult
  - vs contiguous frames
  - vs small region
  - vs coherent motion of group
- small static set, or dynamic from many possible?

System: Improvise
- investigate potential of multiple views
  - pushing limits on view count, interaction complexity
  - how many is ideal
  - open research
  - non-durable loss
  - easy backup
  - useful when linked to other encodings

Idiom: Trellis plots
- matrix alignment for small multiple plots
  - same issues as alignment for marks within plot!
  - partition by
    - year for columns
    - site for rows (alphabetical)
  - within pane
    - variety for vertical axes
    - yield for vertical position

Partitioning: List alignment
- single bar chart with grouped bars
  - split by state into regions
  - compare easy within state, hard across ages
- small-multiple bar charts
  - split by age into regions
  - one chart per region
  - compare easy within age, harder across ages

Partitioning: Recursive subdivision
- switch order of splits
  - type then neighborhood
- switch color
  - by price variation
- type patterns
  - within specific type, which neighborhoods inconsistent

Static visual layering
- foreground layer: roads
  - high luminance contrast from background
- background layer: regions
  - desaturated colors for water, parks, land areas
- user can selectively focus attention
  - “get it right in black and white”
  - check luminance contrast with grayscale view

Idiom: Trellis plots
- main effects ordering
  - order small-multiple plots based on derived data to see trends
  - order plots by median values
  - shared vertical axes within each plot ordered by median values within varieties

System: HIVE
- size regions by sale
  - not uniformly
  - result: treemap
- different encoding for second-level regions
  - choropleth maps

Partition into views
- how to divide data between views
  - split by region by virtue
  - encodes association between items using spatial proximity
  - order of splits has major implications for what patterns are visible
- no strict dividing line
  - view hierarchy
    - contiguous region in which visually encoded data is shown on the display
    - glyph size/size
  - offset with internal structure that arises from multiple marks

Partitioning: Recursive subdivision
- split by neighborhood
  - then by type
  - then time
  - years as rows
  - months as columns
  - color by price
- neighborhood patterns
  - varies by expensive
  - where you pay more for detached type

Idiom: Trellis plots
- superimpose within same frame
  - color code by year
**System: Cerebral**

• interactive, from selection
  – lightweight: click
  – very lightweight: hover
  
• ex: 1-hop neighbors

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**Dynamic visual layering**

• one-hop neighbour highlighting demos: click vs hover

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**Further reading**

  – Chap 12: Facet Into Multiple Views
  – Chap 13: Overview+Detail, Zooming, and Focus+Context Interfaces.