Visual encoding and interaction idiom: How

Actions: Encode

Encode

• key
  – independent attribute
  – used as unique index to look up items
• value
  – dependent attribute, value of cell
• classify arrangements by key count
  – 0, 1, 2, many...

Encode tables: Arrange space

• Attributes (columns)
• Items (rows)
• Cell containing value

Networks

Value in cell

Dataset Types

Geometry (Spatial)

Position

Spatial

SPATIAL DATA

Spatial Data Abstraction

3

Tables

Attributes (columns)

Items (rows)

Cell containing value

Networks

Link

Node (item)

Trees

Multidimensional Table

Value in cell

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Tables
**Idioms:** radial bar chart, star plot

- **radial bar chart**
  - radial axes meet at central ring, line mark

- **star plot**
  - radial axes, meet at central point, line mark

- **bar chart**
  - rectangular axes, aligned vertically

- **accuracy**
  - length unaligned with radial
  - less accurate than aligned with radial

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**Idioms:** line chart

- **one key, one value**
  - data
  - 2 quant attributes

- **two keys, one value**
  - line connection, marks between them

- **channels**
  - aligned lengths to express quant value

- **task**
  - find trends

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**Idioms:** cluster heatmap

- **in addition**
  - derived data
  - 2 cluster hierarchies

- **dendrogram**
  - parent-child relationships in tree with connection lines marks

- **matrix**
  - rows assigned to interior branch heights easy to compare

- **heatmap**
  - marks (re)ordered by cluster hierarchy traversal

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**Idioms:** scatterplot matrix, parallel coordinates

- **scatterplot matrix (SPLOM)**
  - rectilinear axes, point mark
  - all possible pairs of axes
  - scalable
d

- **parallel coordinates**
  - parallel axes, jagged line representing item

- **axis order is major change**

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**Idioms:** pie chart, polar area chart

- **pie chart**
  - angles marks with angle channel

- **polar area chart**
  - area marks with length channel

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**Idioms:** normalized stacked bar chart

- **task**
  - part-to-whole judgements

- **normalized stacked bar chart**
  - stacked bar chart, normalized to full width

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**Idioms:** glyphmaps

- **rectilinear good for linear vs nonlinear trends**

- **radial good for cyclic patterns**
Orientation limitations:
- rectilinear: scalability wrt #axes
  - 2 axes best
  - 3 problematic
    - more in afternoon
  - 4+ impossible
- parallel: unfamiliarity, training time
- radial: perceptual limits
  - asymmetry: angles lower precision than lengths
  - sometimes can be exploited

Further reading:
  - Chap 2: Data Abstraction
  - Chap 3: Task Abstraction
  - Chap 7: Tables
  http://www.datavis.ca/milestones

Lab/Assignment 2:
- two main datasets
  - development aid from Guardian Datablog
  - your choice from small set
- focus on tasks and spatial layout as discussed in class for your exploration, story discovery, and writeup
  - provide rationale justifying your design decisions
- submit next week
  - by 9am Tue, email tmm@cs.ubc.ca with subject JOURN Week 2