

Week 6: Networks, Stories, Vis in the Newsroom

Tamara Munzner
 Department of Computer Science
 University of British Columbia

JRNL 520H, Special Topics in Contemporary Journalism: Data Visualization
 Week 6: 18 October 2016

<http://www.cs.ubc.ca/~tmm/courses/journ16>

News

- Assignment 3, 4, 4-solo marks out
 - Assign 4: 90% pair mark, 10% solo mark for proposal
 - Assign 4 pair: min 74.8, avg 84.2, max 100
 - Assign 4 solo: min 50, avg 89.7, max 100 (5% of Assign 6 grade weight)
 - Assign 3
 - min 83.8, avg 93.6, max 100
- things to watch out for
 - diverging vs sequential colormaps
 - line charts vs bar charts (continuous vs discrete data)
 - absolute counts vs relative percentages
 - highlighting/emphasis vs filtering out completely
 - does your interaction make sense? does it help somebody?
 - please submit packaged workbooks (twbx) not plain workbooks (twb)

Schedule

- today: office hours 12:30-1:30pm, Tamara & Caitlin
- next week:
 - Tamara on travel Sat Oct 22 - Sat Oct 29
 - at VIS conference in Baltimore, likely extremely slow with email
 - Caitlin here
 - Tue Oct 25 9:30-12:30, 1:30-4:30 in Sing Tao bldg room 313, drop by for help/discussion
 - available by email throughout the week
- two weeks:
 - project 6 due Tue Nov 1 9am

Today

- stories
- networks
- (break)
- vis in the news
- beyond this class
- individual meetings on final project

Assignment 6

- find dataset, visualize it, and write story about it
 - you've now had practice in
 - effective visual encoding: space, color
 - finding the story within a dataset
 - wrangling
 - linking up and partitioning into multiple views
- you're encouraged to consult with us if you get stuck!
 - is your idea viable/newsworthy?
 - how can you do what you want inside Tableau?
 - is your visual encoding well justified?
- you're encouraged to post story publicly (but not required)
 - note you can embed vis within web page with Tableau Public

Last Time

Last Time: Rules of Thumb

- No unjustified 3D
- Resolution over immersion
- Overview first, zoom and filter, details on demand
- Responsiveness is required
- Function first, form next

Demos 1 & 2: Wrangling Tutorial, Simple Survey

- Credit: Caitlin Havlak
- Wrangling Lessons
 - first row for headers (right menu over source in
 - Tableau data interpreter
 - manual Excel/GoogleDoc cleaning
- Big Ideas
 - reshaping data: from wide to tall
 - joins: inner, left, right, outer
 - pivots: one observation per row, no cross-tabulation

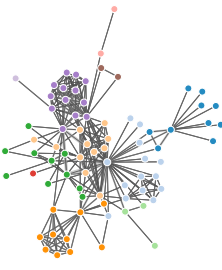
Stories

Networks

Arrange networks and trees

Idiom: force-directed placement

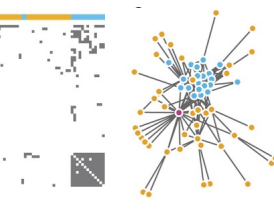
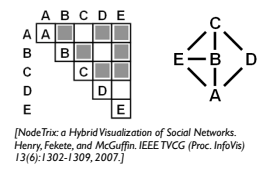
- visual encoding
 - link connection marks, node point marks
- considerations
 - spatial position: no meaning directly encoded
 - left free to minimize crossings
 - proximity semantics?
 - sometimes meaningful
 - sometimes arbitrary, artifact of layout algorithm
 - tension with length
 - long edges more visually salient than short
- tasks
 - explore topology; locate paths, clusters
- scalability
 - node/edge density $E < 4N$



<http://mbostock.github.com/d3/vis/force.html>

Idiom: adjacency matrix view

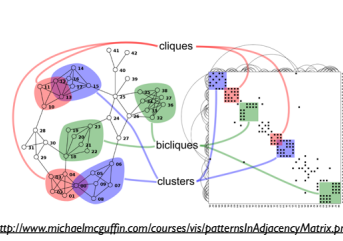
- data: network
 - transform into same data/encoding as heatmap
- derived data: table from network
 - 1 quant attrib
 - weighted edge between nodes
 - 2 categ attribs: node list x 2
- visual encoding
 - cell shows presence/absence of edge
- scalability
 - 1K nodes, 1M edges



[Points of view: Networks. Gehlenborg and Wang. Nature Methods 9:115.]

Connection vs. adjacency comparison

- adjacency matrix strengths
 - predictability, scalability, supports reordering
 - some topology tasks trainable
- node-link diagram strengths
 - topology understanding, path tracing
 - intuitive, no training needed
- empirical study
 - node-link best for small networks
 - matrix best for large networks
 - if tasks don't involve topological structure!

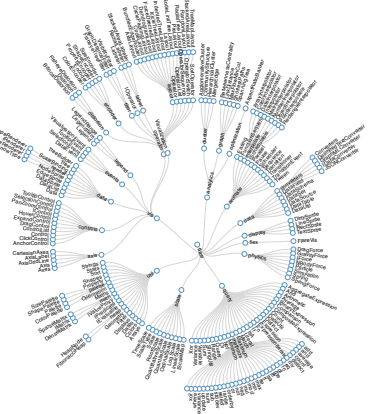


<http://www.michaelmcguffin.com/courses/vis/patternsinAdjacencyMatrix.png>

[On the readability of graphs using node-link and matrix-based representations: a controlled experiment and statistical analysis. Ghoniem, Fekete, and Castagliola. Information Visualization 4:2 (2005), 114–135.]

Idiom: radial node-link tree

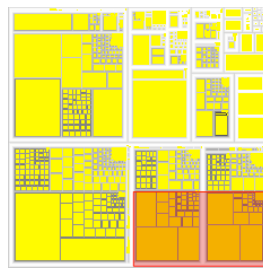
- data
 - tree
- encoding
 - link connection marks
 - point node marks
 - radial axis orientation
 - angular proximity: siblings
 - distance from center: depth in tree
- tasks
 - understanding topology, following paths
- scalability
 - 1K - 10K nodes



<http://mbostock.github.com/d3/vis/tree.html>

Idiom: treemap

- data
 - tree
 - 1 quant attrib at leaf nodes
- encoding
 - area containment marks for hierarchical structure
 - rectilinear orientation
 - size encodes quant attrib
- tasks
 - query attribute at leaf nodes
- scalability
 - 1M leaf nodes

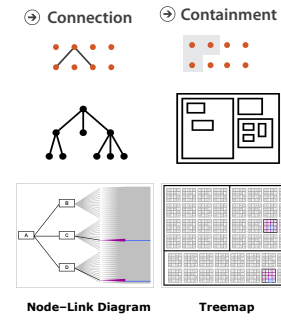


http://tulip.lsbri.fr/Documentation/3_7/userHandbook.html#ch06.html

17

Link marks: Connection and containment

- marks as links (vs. nodes)
 - common case in network drawing
 - 1D case: connection
 - ex: all node-link diagrams
 - emphasizes topology, path tracing
 - networks and trees
 - 2D case: containment
 - ex: all treemap variants
 - emphasizes attribute values at leaves (size coding)
 - only trees

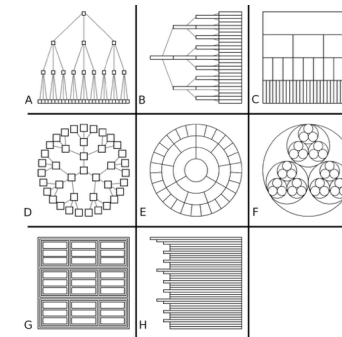


[Elastic Hierarchies: Combining Treemaps and Node-Link Diagrams. Dong, McGuffin, and Chignell. Proc. InfoVis 2005, p. 57-64.]

18

Tree drawing idioms comparison

- data shown
 - link relationships
 - tree depth
 - sibling order
- design choices
 - connection vs containment link marks
 - rectilinear vs radial layout
 - spatial position channels
- considerations
 - redundant? arbitrary?
 - information density?
 - avoid wasting space



[Quantifying the Space-Efficiency of 2D Graphical Representations of Trees. McGuffin and Robert. Information Visualization 9:2 (2010), 115-140.]

19