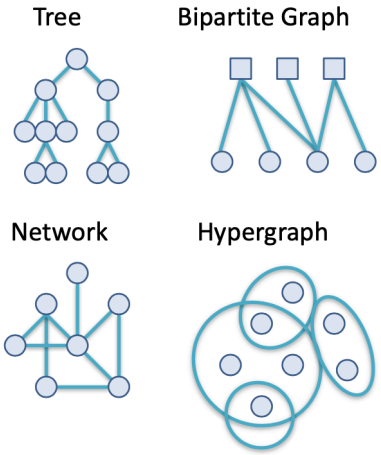
Lecture 4: Data Encoding (2)

Node-Link Diagrams

* work for network and trees
* suited for path-related tasks
  * Could also see neighbourhood, but if you have lots of intersecting nodes and a very dense note-link diagrams, it's hidden by all these edges that across each other
* Three Layouts:
  * **Free**: freely position the nodes
  * **Styled**: position all the nodes along the circle or along any other kind of helper structure that you must in the background
  * **Fixed**: can't control the position of the nodes
* **Force Directed Layouts**
  * Physics model
    * edges = springs, vertices = repulsive magnets
  * Notes that have connections attract each other, notes that do not have connections repulse each other
  * Aim: minimisation of the overall summed-up forces
  * Downsides: High running time
* Over-plotting Problem: edge clutter
  * Solution: hierarchical edge bundling:
    * Make a bundle by applying a force between edges



Adjacency Matrix

* work for networks and trees
* Show the same information for node-link diagrams
* Loops along diagonal
* Direction can also be encoded
* **Well suited for neighbourhood-related tasks**: if you want to know which characters are heavily interacting in the play, or which company have a heavily close relationship to each other
* Not suited for path-related tasks
* Like heat-map, which only makes sense if you apply a meaningful order to the rows and to the columns

Enclosure

* work for trees
* Scale well to large hierarchies
* Draw the area, use the space within the area to encode the topology
* It only works with Tree
* Tree maps:
  * Have some kind of hierarchy that drives the layout and it drives the partitioning of the space in the tree map
  * Starting from the root node, subdivided by all children, and further subdivided along the hierarchy

Geospatial Data | Maps

* Shape of items
* Explicit spatial positions
  * Points, lines, curves, surfaces, regions, volumes

* Not a core visualisation topic
  * Important in cartography, computer graphics, CAD, ...
  * Only interesting for visualisation if data is encoded

Map Projections

* Cylinder projection
  * Allow entire surface to be visible
  * **Mercator Projection**
    * Projection onto a cylinder wrapped around the globe
    * Conformal map projection —> angles are preserved
    * Pro: all lines of constant bearing are straight lines
      * Constant compass heading for sailors
* Plane projection
  * Tangent point corresponds to center point in projection
* Cone projection
  * Lat = circles around projection, long = straight lines

Mecator Puzzle

* Traditional map used to teach geography have massive distortion of area distant from equator

Dot Map: a dot for every data Item

* it can lies, because it always look like a population map

Choropleth Map

* Greek: chore = area, pleth = value
* Area uniformly coloured/shaded proportional to attribute
* It could be misleading, as larger areas appear more important.
  * Solution:
    * Proportional Symbol Map: Scale size of point by population

Isarithmic Map

* Color coding continuous phenomena

Cartograms

* take the size of the region and descale it to some attributes

Flow map:

* show network or graph data on top of a map

Tag Cloud / Word Cloud / Wordle

* Change word size/color by frequency