Lecture 11: Trees and Networks

In this lecture we will examine ways to visualize trees and networks (graphs).

Goals for the lecture

By the end of the class, you will be able to:

- Explain why visualizing large graphs and trees is a challenge, and describe several approaches that address this problem.
- Describe heuristics for creating effective graph & tree layouts.
- Evaluate graph and tree visualization techniques.

Reading Assignment

Graph Visualization in Information Visualization: a Survey. Ivan Herman, Guy Melancon, M. Scott Marshall. IEEE Transactions on Visualization and Computer Graphics, 6(1), pp.24-44, 2000. (Okay to skim sections that aren't part of the questions below.) http://citeseer.ist.psu.edu/herman00graph.html (Click on the cached PDF link in the upper right corner)

Things to consider as you read

1. Real world graph and tree datasets may be very large. Why does this make their visualization a challenge?
2. What are some guidelines for creating a good graph or tree layout?
3. What approaches can be used to improve visualization of large graphs and trees?
4. Compare Treemaps to Node-Link diagrams.

Reflection questions

These questions are to help you think more broadly about what you've read and its relationship to the class. It is optional, but strongly encouraged, that you answer them and email your answers to info424@gmail.com to aid in discussion in class. Email must be received by 11 am on the day of the class.

1. In static information visualization, designs like 3D bar charts are criticized heavily for occlusion. Do you think that these same criticisms apply to 3D tree layouts like cone trees? Why or why not? Discuss advantages and disadvantages of cone trees.

2. If your project has hierarchical or network-oriented data, how might you visualize it?