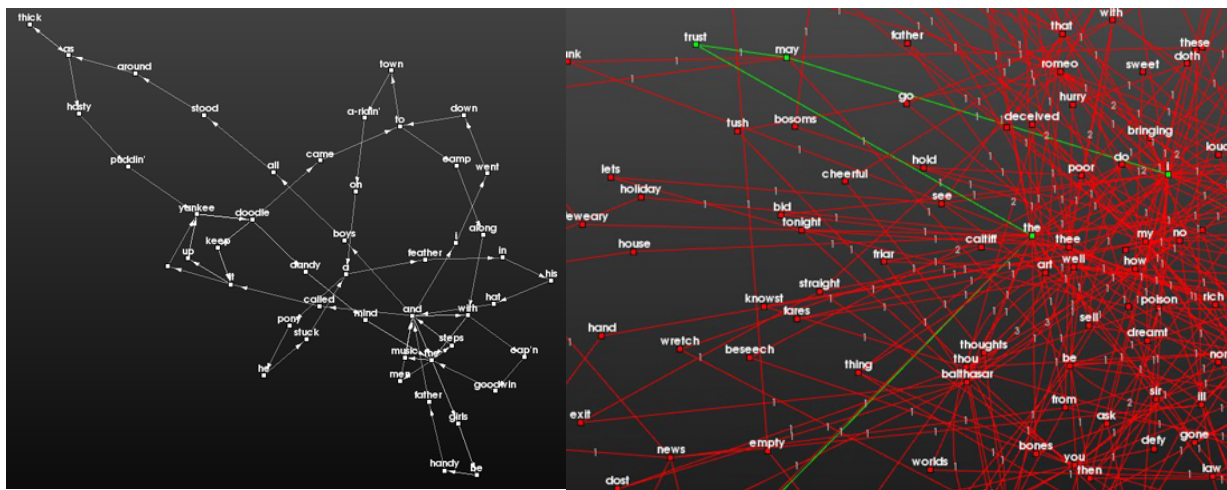


CSCI 4972 Introduction to Visualization

Assignment #2 Network Visualization

Due: Monday September 13th at 5pm

A classic tool in information visualization to show the structure of relationships between entities is the directed or undirected graph. For this assignment we'll experiment with simple graph visualizations in VTK. To create the left image below, we have taken the text of the nursery rhyme "Yankee Doodle" and created a vertex for every unique word in the rhyme. Then, we add a directed edge between words that appear adjacent to each other within the rhyme. Visualizing this with the spring force automatic layout strategy, we can see the most common words have more connections and tend to collect in the center, along with common phrases. The least frequently used words appear on the perimeter.



For in-class work on Wednesday, use a very simple network to familiarize yourself with the features of the VTK graph library. Learn how to add labels on the vertices and/or edges, how to specify directed edges, and change color of vertices and/or edges. When you are ready to begin the homework, pick any "real-world" dataset that you are interested in exploring in detail. For example, you could visualize your peer network (Facebook, etc.) using a graph. Do the obvious "clusters" correspond to what you would have called "cliques" of people you know? However, make sure you select a problem for which you can easily acquire the necessary data, since large datasets can be more interesting and often require creative solutions to effectively visualize patterns.

Use labels, color, and/or layout to enhance a feature in the graph. For example, in the right image above, a single sentence has been visualized by coloring the edges connecting words in that sentence in green. The sentence travels from the dense central core of the graph (most frequently used words) to the outer edges for the rarely used words and back again.

Assignment Requirements

- Select a network in the real world (for which you have/can acquire data)
- Store a representation of the network as a directed or undirected graph in VTK

- Experiment with different 2D or 3D layout strategies
- In studying the structure of the data, identify one or more interesting features or observations about the data
- Use color/labels/directed edges/layout to enhance your visualization of this feature, and more effectively communicate your observations about the data
- Write a couple paragraphs describing the purpose, design, and implementation of your visualization (use the README.txt template)

Grading Criteria

(5 pts) Creativity of network selection and the visualization design

(5 pts) Effectiveness of visualization & writeup

(10 pts) Technical content (e.g., network data preprocessing/parsing, VTK graph construction, graph coloring, layout strategy)

How to Submit:

- Post at least one screenshot of your visualization and a short paragraph describing the purpose and design of your visualization on LMS.
- Submit the source code (and any necessary data files) for your program to the CS homework server.