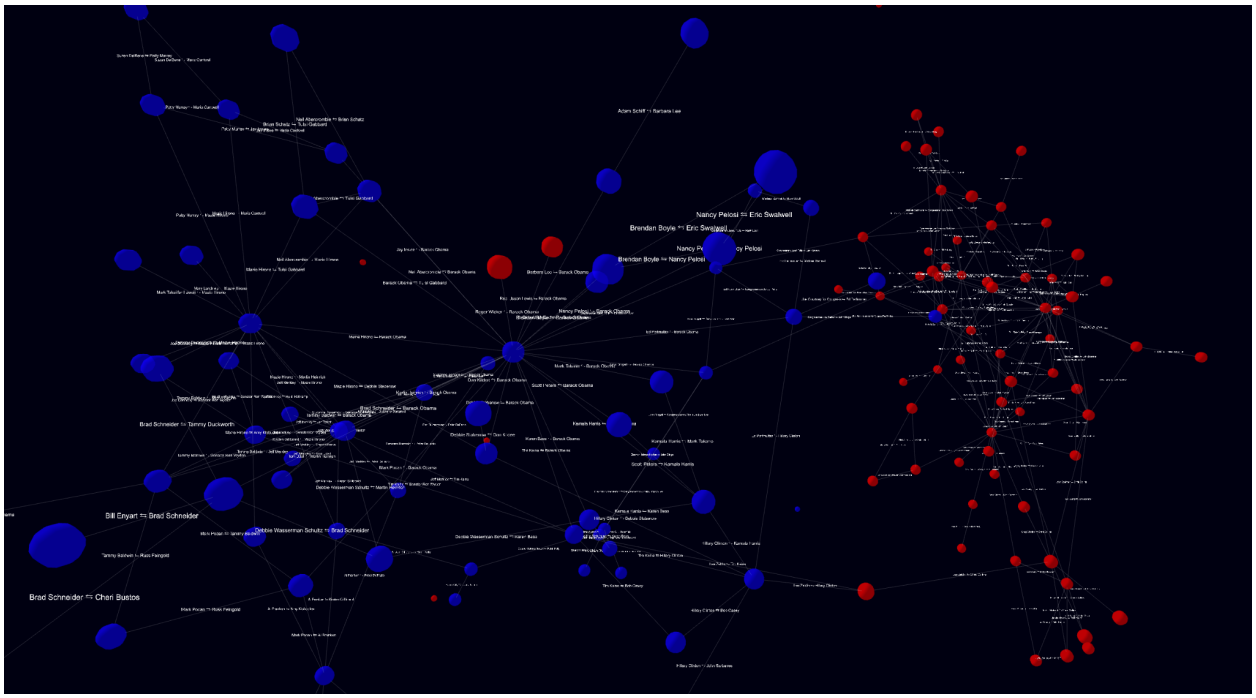
Samantha Lee
Professor Aanjaneya
Computer Graphics (16:198:523)
4 May 2022

CS523 Final Project: Congress Cliques on Facebook

Overview

I have created a 3D force-directed graph that displays the mutually liked pages of American politicians on Facebook. The live graph is available at the following link: https://whimsical-speculoos-8e7417.netlify.app/



Implementation

Following the project milestone, my goals were to filter Facebook pages to exclusively those of American politicians, determine the political affiliations of the politicians, and implement more interactive and descriptive features in the force directed graph.

To filter the pages, I created a Python script (fdg/src/fetchmetadata.py) that cleans the original network dataset, which has 5.9K nodes and 41.7K edges. The first round of filtering ensured that the characters in the politician's name were ASCII characters. Given that many politicians of color officially go by anglicized versions of their name, this process verified that there were no names with non-Latin characters that would indicate foreign nationalities.

Then, I used the Propublica Congress API to check which of the remaining people were indeed congresspeople. I used a loop to make separate calls that returned JSON files containing information about the previous 10 terms of the US Senate and US House of Representatives. Then, for every member of congress, I checked if they had a Facebook page by cross-checking against the filtered list of ASCII names. If they did, I added their political affiliation ("D" for Democrat or "R" for Republican) to the node data.

Beyond the steps above, remaining logic can be found in fdg/src/index.js. To provide more immediate information to the viewer, I added name data to the link CSV, which originally only included numeric IDs for the nodes. Then, I was able to label each link with the two nodes it connects. Since the entire graph is undirected, I used the double arrows to indicate transitivity.

Interactive Features

A user can interact with the graph in various ways.

1. A user can pan the view by right clicking
2. A user can rotate the view of the graph by left clicking
3. A user can scroll to zoom in and out
4. A user can hover over a node to view the name of the politician it represents
5. When a user drags a node to a specific spot, the node will be fixed
6. Clicking a node will result in camera zoom to that node

I had tried to implement a highlighting feature that would change the color of the selected node and its links, but due to the potentially high number of links a node may have, it caused the program to lag severely.

Analysis

The graph shows a clear divide between Democrat and Republican relations on Facebook, as the majority of nodes are grouped with those of their own party. Politicians tend to mutually follow those of like-minded views, which can increase polarization and the development of echo chambers on social media. On the other hand, the visualization allows us to examine the outliers who cross partisan boundaries and follow members of the opposing party.