

It's Complicated: A Visual Exploration of the Political Landscape of Reddit

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CS 224W, Fall 2018

ABSTRACT

We study data of posts and comments on Reddit to explore the nature of political discussions on the platform. We use a flexible graph folding algorithm to translate user behavior into relationships among subreddits, and provide a troll detection algorithm to remove potentially distracting contents. We present easy-to-understand visualizations to showcase our results, which suggest the existence of selective exposure.

DATASET

- 5 months of Reddit comments and posts
 - 3 from 2016
 - 2 from 2017
- Limited to activities in 211 politically relevant subreddits in the Reddit Politosphere
- 7,114,602 comments
- 559,977 posts
- Capped the # of comments/posts per subreddit to normalize for popularity when generating graphs

METHODS

Graph Folding

- Bipartate graph of users and subreddits, folded to generate subreddit graph where subreddits connected to common users are connected
- Conditions for edges to exist in bipartite graph configurable based on:
 - Choice of posts and/or comments
 - # of users in common
 - Filtering of troll-like contents

Troll Detection

- Gaussian Mixtures Model (GMM) to perform unsupervised clustering
- Identification of troll users based on both user activity and community response

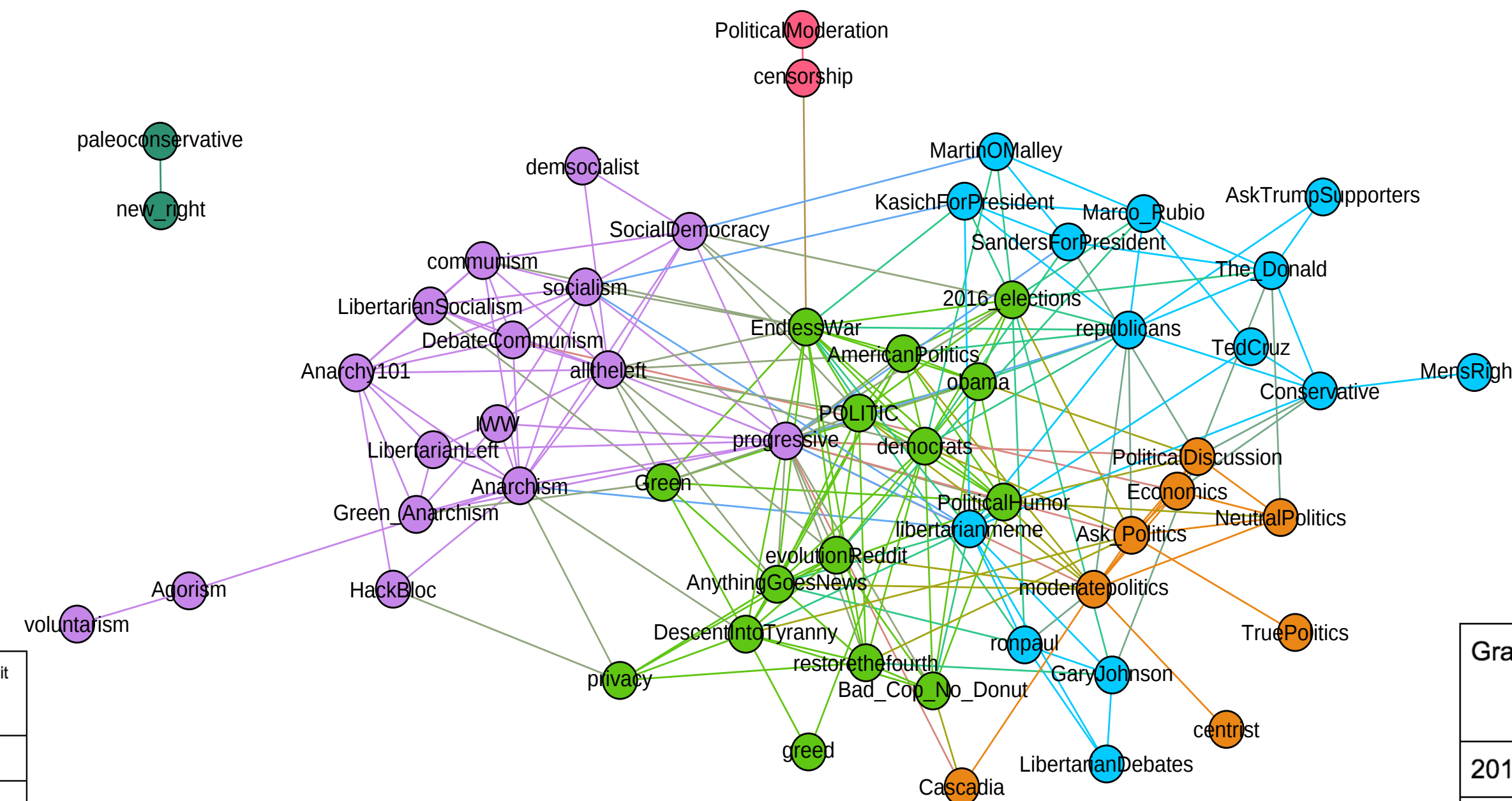
Community Detection

- Louvain algorithm for clustering
- Visualization through Gephi

RESULTS

The average features per cluster for 2016 is shown below. We identify users in cluster 8 to be troll users. This cluster includes users who have low karma, and who write short comments that receive low scores, are easily comprehensible without difficult words but have low text standard, and also include profanity words and are controversial. In the paper, we also present hypotheses on what other clusters represent.

Cluster	Comment karma	Link karma	Read ability index	Readability score	Reading ease	Difficult words	Text standard	Number of words	Score	Controversiality	Profanity
1	4114	572	8.29	6.49	64	2.98	6.03	18.79	2.82	0	0.01
2	21444	6626	93.15	15.81	-112.97	31.25	8.27	184.67	9.25	0.07	0.18
3	16338	1637	43.68	10.8	-7.24	15.37	8.94	88	3.74	0.02	0.12
4	1350168	6395765	2.35	4.4	69.31	1	2.8	11.3	-2	0.4	0
5	22878	3178	13.34	8.6	34.48	8.2	7.91	48.11	4.25	0.04	0.08
6	130045	122813	24.89	8.53	29.55	8.72	7.35	50.88	5.68	0.03	0.07
7	41886	9992	11.97	7.12	56.79	4.18	6.66	25.98	5.48	0.04	0.07
8	17890	4001	5.05	5.64	71.65	1.91	4.78	13.62	3.8	0.08	0.15



This is a 2016 graph - subreddits connected by 5 or more shared comments - considering 1000 comments per subreddit - trolls excluded. The majority of politically relevant subreddits are connected with one another, with ones that represent similar political inclinations (such as r/The_Donald and r/republicans, or r/obama and r/democrats) largely in the same cluster, and ones with dissimilar political inclinations largely in separate clusters.

We compare our clustering results against the manually curated and categorized list of the Reddit Politosphere. Specifically, we look at the completeness score, which measures the extent to which all members of a given class (in the Reddit Politosphere list) are assigned to the same cluster (by our algorithm). With completeness scores largely over 0.5 and significantly exceeding the null their corresponding null model scores, we can preliminarily conclude that selective exposure exists.

Graph	Score	Null Model Score	Difference
2016 Comments - Only trolls	0.579	0.369	0.210
2016 Comments - All users	0.521	0.242	0.278
2016 Comments - Exclude Trolls	0.652	0.353	0.298
2016 Posts	0.554	0.368	0.185
2017 Comments - Only trolls	0.514	0.477	0.037
2017 Comments - All users	0.428	0.368	0.059
2017 Comments - Exclude Trolls	0.413	0.309	0.104
2017 Posts	0.506	0.266	0.240