DATA: Article Sets for 220 Texas congressional politicians collected from NYTimes, Houston Chronicle, etc.

Named Entity Recognition over articles to construct Political Networks.
DATA: sample Political Network and Article Distribution

Eddie Rodriguez has most combined same, near, article occurrences with

Politician Tom Craddick - (77)
Person Rick Perry - (96)
Organization Houston - (83)
Location AUSTIN - (241)
Bill House Bill 506 - (3)
Misc Travis County - (91)

Eddie Rodriguez has most same sentence occurrences with

Politician Dawnna Dukes - (17)
Person Hugh Keefe - (6)
Organization Tesla - (8)
Location AUSTIN - (52)
Bill House Bill 506 - (2)
Misc Travis County - (27)
DATA:

Link between 2 Politicians

Eddie Rodriguez

Dawonna Dukes

Relationship between Eddie Rodriguez and Dawonna Dukes
32 co-occurrences found in 31 articles.

Dawonna Dukes is a Democratic member of the Texas House of Representatives. First elected in 1994, Dukes represents District 46 (East Austin) within Travis County. In 2017, Dukes was indicted by a grand jury on 13 felony charges and two misdemeanor charges related to abuse of public office. Later that year, all criminal ... wiki

Austin faces gathering storm over rates 1
2012-06-09 | AUSTIN AUSTIN STATESMAN
They are the six members of the Austin legislative delegation: State Senator Kirk Watson and Representatives, Elliott Naishht, Donna Howard, Eddie Rodriguez and Dawonna Dukes, all Democrats, and Paul Workman, a Republican.

With filing over election season can begin
2012-03-09 | AUSTIN AUSTIN STATESMAN
Austin state Representatives, Dawonna Dukes, Donna Howard, Elliott Naishht, Eddie Rodriguez and Mark Strama will all go unchallenged in the Democratic primary.

Many texas schoolchildren fail fitness evaluatio 1
2011-04-14 | AUSTIN AUSTIN STATESMAN
Austin-area state Representatives, Tim Kleinschmidt, Dawonna Dukes, Eddie Rodriguez and Lois Kolkhorst did not return calls or emails seeking comment.
TASK: LINK DETECTION

Given: Politician A, Politician B

Predict: who has more of a “link” or “affiliation” with Politician C

David Simpson
TASK: LINK DETECTION

Pol A - Pol C = 38 co-occurrences
Pol B - Pol C = 10 co-occurrences

So Pol A - Pol C is the correct prediction (i.e., network gives us supervision)
**Task:** Link Detection

**Pol A - Pol C** = 38 co-occurrences **correct prediction**

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Championing a farm to table movement in texas.html
2012-09-16 | NEW YORK TIMES

Simpson and Mr. Rodriguez supported an unsuccessful bill last session to allow licensed farmers to sell unpasteurized milk at farmers' markets or approved locations.

Rodriguez has drafted a variety of ideas for the caucus to consider, like reducing barriers to tax exemptions for urban farms, allowing on-site processing of wild game that could be introduced into soup kitchens, and expanding the Cottage Food Law. "Right now, it's easier to get cigarettes than to get milk the way God made it," Representative David Simpson, a Republican from Longview and caucus member, said of restrictions on the sale of unpasteurized milk.

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American digest
2013-02-23 | AUSTIN AUSTIN STATESMAN

She and other members Representative Eddie Rodriguez, D-Austin, and tea party favorite Representative David Simpson, R-Longview are working on measures dealing with such issues as reducing taxes on small farms, making it legal for small producers to offer samples at farmers markets and limiting fees that farmers can be charged at those markets.

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Caucus offers several small farm bills
2013-02-16 | AUSTIN AUSTIN STATESMAN

State Representative Eddie Rodriguez, D-Austin and chairman of the Legislature's new Farm to Table Caucus, has been working with the caucus vice chair, Representative Lois Kolkhorst, R-Brenham, and other members, including tea party sweetheart Representative David Simpson, R-Longview, on an assortment of food-related bills.
INITIAL RESULTS: BASELINES over 125k test set

1. NLP only baseline = 63 % accuracy
   Each politician is represented as a normalized sum of pre-trained GloVe embeddings of each of their articles. Predict based on greater Cosine Similarity of Pol A and Pol C vs Pol B and Pol C.

2. Network Analysis = 72 % accuracy
   Each politician is represented as the set of their immediate neighbors. Predict whoever has greater set intersection with Pol C.
INITIAL RESULTS: BASELINES over 125k test set

3. Graph Embeddings - *Ongoing*
   - Compare Factorization, Random Walk & Deep Learning methods as mentioned in Goyal, Ferrara 2017

   - Poor initial results across the board with “one-hop” nets.

   - Simple baseline based on full combined large networks with 100 mil edges to get a political adjacency matrix where each row is its representation = 65.9% accuracy

   - Graph embedding methods on combined network with more extensive grid search over hyper params.
**NEXT STEPS:**

- **Combine and Conquer (hopefully)**
  - Compare pretrained GloVe representations to doc2vec learned embeddings
  - Use concatenation of NLP rep and Graph Emb rep as input to logistic regression or neural model to jointly learn task.
  - *(future)* Voting prediction as sequence model task
  - *(future)* Explainability of predictions