Influence Network in the UN Security Council

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Abstract: An influence network is a way of looking at a group of connected individuals, whether they are people, countries, companies, etc., and exploring the relationships between them. The actions of each individual have some pull, whether it be positive or negative, on the actions of each other individual. We have taken this idea of an influence network and applied it to the five permanent members of the United Nations Security Council in order to determine how their voting preferences may be influenced by each other. We were able to create an influence network among the five permanent members that is 94% accurate in identifying how each member would likely vote for all contentious votes since records began in 1994.

1 INTRODUCTION

It comes as no surprise that the decisions we make are in part due to influence from others. This can be seen on a scale as small as someone deciding to go to the beach because their friend is going to the beach but it can also be seen on a larger scale such as Apple adopting larger screens in mimicry of Android devices, or an even larger scale like the United States putting a trade embargo on Cuba due to Castro's ties to the Soviet Union.

In this paper, we explore the influences among the permanent members of the UN Security Council and how they vote given how other members vote. Looking only at cases in which there was not a unanimous vote of yes, that is, the contentious cases, we have created an influence network among the five permanent members. Each individual is given an influence rating, that is, how powerful their decisions are in terms of affecting the decisions of others. In addition, we have directional influence from each individual to every other individual. These connections form our influence network.

In Section 2, we discuss the UN Security Council and why it is important to be looking at this group of five permanent members in particular. Following that, in Section 3, we discuss Influence Networks in more detail and explain how it can be applied to our network. We follow this with a discussion of our experimental methodology in Section 4 and a detailed account of our results in Section 5. We conclude with a reflection on further work we could pursue in Section 6 and a summary of our work in Section 7.

2 UNITED NATIONS SECURITY COUNCIL

The United Nations Security Council is one of the six major groups within the United Nations. It has the role of maintaining international peace and security among other, smaller tasks such as welcoming new members to the UN and approving any changes to the UN Charter. Our focus specifically is on the permanent members of the Security Council due to the council's structure and voting procedure. An image of the Security Council assembly can be seen in Figure 1.

2.1 Security Council Structure

At any given time, there are fifteen members of the UN Security Council. Five of these members are permanent and the other ten serve two-year terms, with five being replaced each year. The current non-permanent members of the Security Council for whom this is the second year are Egypt, Senegal, Uruguay, Ukraine, and Japan. Ethiopia, Kazakhstan, Bolivia, Sweden are in their first year, and Italy and the Netherlands are splitting a term, with Italy serving in 2017 and the Netherlands in 2018. The per-

Figure 1: The UN Security Council
Credit: http://www.cfr.org/international-organizations-and-alliances/un-security-council-unsc/p31649

manent members of the Security Council are Russia, China, France, the UK, and the US, and these permanent members are our focus due to their heightened power when voting.

2.2 Voting

When the Security Council decides to put a matter to vote, it is done through a show of hands. The representatives from the UK and the US can be seen raising their hands for one such vote in Figure 2. Effectively, it can be thought of as a single-shot three action game with fifteen players. However, before the vote is held, there is a discussion on the topic in which each country has a chance to voice their thoughts on the issue, thus enabling other countries to have some indication of how they may be voting but no guarantee until the vote actually happens. When voting, each country can choose to vote yes, to vote no, or to abstain from the vote. Each vote is a modified simple majority vote. Unless one of the permanent members votes no, it takes a majority (8) votes of yes to pass a referendum. However, the five permanent members each have veto power, so a vote of no from any one of them results in the referendum failing.

Figure 2: US and UK Voting
Credit: https://justiceinconflict.org/2011/08/31/used-and-abandoned-libya-the-un-security-council-and-the-icc/

3 INFLUENCE NETWORKS

Influence Networks are an effective way of demonstrating weighted connections, either positive or negative, between individuals. Influence networks are typically represented as a graph in which each individual is a node and the connections between those individuals are edges. Each edge has a weight attached to it, and a common technique of demonstrating the amount of weight on an edge is to adjust the thickness of the line. Negative edges are often red and positive edges are often black. Individuals with more influence are typically depicted as larger nodes and those with less influence as smaller nodes.

3.1 Irfan and Ortiz's Senate Network

Our inspiration came from the work of Mohammad Irfan and Luis Ortiz and their exploration of an influence network in the United States Senate. In their case, they were looking at senators as their individuals, while we are looking at each country, represented by a group of people, as an individual. Additionally, the Senate votes as a simple yes/no, while in the Security Council there is the additional option of choosing to abstain. Irfan and Ortiz created a threshold model in their influence network meaning that for each senator, they calculated a threshold level for their voting. When the total influence on the senator was above that threshold, they would vote yes, and when it did not meet the threshold, the senator would vote no. Irfan and Ortiz used the darkness of the node to indicate how "stubborn" an individual is, that is, darker nodes have a higher threshold and require more influence to change their vote. A small portion of the network Irfan and Ortiz created can be seen in Figure 3.

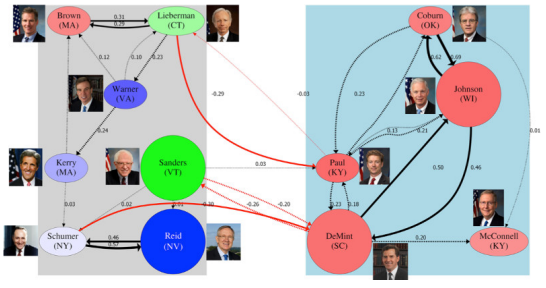

Figure 3: Irfan & Ortiz's Senate Influence Network
Credit: http://www.bowdoin.edu/~mirfan/CSCI-3210.html

4 EXPERIMENTAL METHODOLOGY

In order to create our Influence Network, we began with Data collection. Using meeting transcripts from 1994 to present day found at `http://www.un.org/en/sc/meetings/`, we selected only the votes which were not unanimous among the five permanent members. By selecting only the controversial topics, our goal was to eliminate issues hat countries were less invested in, such as a recent vote in assisting the stabilization of Haiti, and other similar humanitarian efforts that don't stir up much controversy. It was the difficult decisions we wanted to look at, that is, the ones for which countries truly had a vested interest in voting the way they did. We collected voting data for 119 different issues presented at the Security Council, which is every vote since 1994 for which the five permanent members did not all agree on the issue at hand.

4.1 Algorithmic Implementation

Our algorithm is implemented in Python and we create our influence network using the process outlined in Figure 4.

```
BEGIN
for each country i:
  for each other country j:
    for each vote:
      if i voted yes:
        if j voted no:
          decrease i's influence on j
        else if j voted yes:
          increase i's influence on j
        else if j abstained:
          decrease i's influence on j
      else if i voted no:
        if j voted no:
          increase i's influence on j
        else if j voted yes:
          decrease i's influence on j
        else if j abstained:
          increase i's influence on j
END
```

Figure 4: Pseudocode for Creating our Influence Network.

The amount of increase or decrease on the influence between i and j can easily be adjusted but through extensive manipulation of these values, we believe we have found those that create a network that is as accurate as possible. In addition, threshold values in many influence games are dynamic and calculated individually for each node. However, we used static thresholds across the board. These thresholds are explained in Figure 5. While the model produced

Influence Value	Best Response
$i < -1$	NO
$-1 < i < 0$	ABSTAIN or NO
$0 < i < 1$	ABSTAIN or YES
$i > 1$	YES

Figure 5: Influence Thresholds

by Irfan and Ortiz utilized a machine-learning threshold algorithm, the nature of the abstain vote in the UN Security Council forced us to look to other means of implementation. The abstain vote cannot be grouped into the positive or negative influence categories because by definition, a country can abstain for a variety of reasons including both negative and positive feelings about the resolution.

When the influence values were calculated for all UN Security Council members, we fed those results back into the data to check whether countries had historically played the best responses. This is where we got our result of 94% accuracy for these historical votes.

We implemented our algorithm in Python 3.6 using Wing Personal IDE.

5 RESULTS

The algorithm described in the previous section produced an overall influence value for each permanent UN Security Council member as well as directed influence values between every pair of permanent members. The resulting influence network we created can be seen in Figure 6. The size of nodes represent the overall influence that UN Security Council member has on the votes of others. Directed arrows show the influence from individual members on other individual members with arrow thickness as a function of the strength of that influence and arrow color representing whether that influence is positive (black) or negative (red). Significantly, out of the 695 times that individual UN Security Council members were asked to vote, they voted according to their best response 94% of the time.

6 FURTHER WORK

Being able to predict Security Council votes among permanent members could have significant effects on United States foreign policy and international

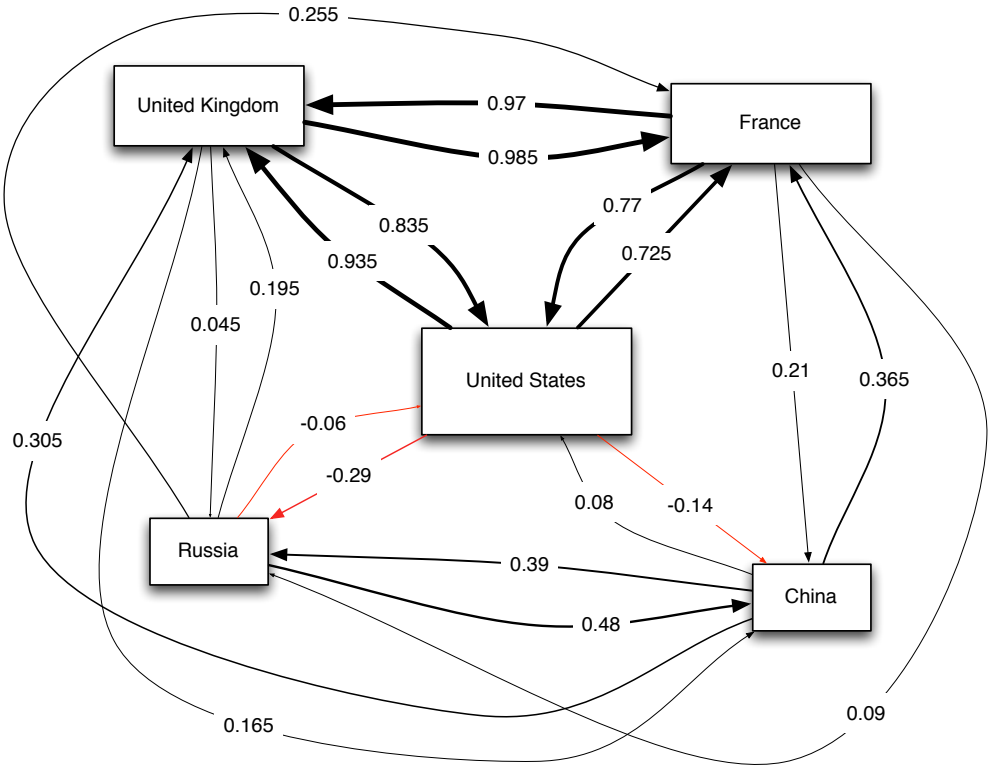

Figure 6: Our UN Security Council Influence Network

reputation. Since a "no" vote by any one of the permanent members dooms the entire resolution, knowing how to vote in order to produce a desired outcome gives a country an advantage at the table. In certain scenarios, strategic voting allows a country to pass/fail the resolution while maintaining a particular reputation. For instance, in S/PV.7853, a resolution condemning Israeli settlements in the West Bank, the United States abstained, knowing that their abstention (as opposed to "no" vote) would allow the resolution to pass. Historically, the United States have vetoed similar votes regarding the Palestinian question due to its strong military alliance with Israel. While the abstain vote and subsequent passing of the resolution represented a shifting attitude towards Palestine in Washington, it didn't provide an opening for a diplomatic rift between President Barack Obama and Israeli Prime Minister Benjamin Netanyahu.

Noting the important real-world applications of this work, we must look to improve our algorithm for more accurate vote prediction. While our algorithm produced influence values that were highly accurate in regard to historical voting tendencies, the 94% statistic could be higher by reworking our computational approach. For example, building a machine-learning threshold model, similar to that of the Irfan/Ortiz experiment, might produce more accurate influence values even though this algorithm has not, to our knowledge, been attempted on a two-threshold model such as UN Security Council voting.

6.1 "How Should I Vote" Applet

For those times when a country is having a hard time deciding how to vote, we are developing the "How Should I Vote" applet. Currently, it is only a Python 3.6 script that we are running in Wing Personal IDE, but we hope to convert it to an application, either mobile or for a desktop environment, that can be used by the Security Council members. The user simply enters and confirms which country they represent, then continues by entering the likely vote of each other country. There is no way to know these votes for sure ahead of time, but it is often the case that each country makes its intentions clear in the discussion before the vote. After entering the votes of each other country, the program tells the user what the best response would be for their country based on its voting history.

7 CONCLUSIONS

Even with a limited knowledge of Security Council voting, we approached this problem with some ideas of certain countries we believed would have certain types of influence on each other. For example, current events and relevant media shows that Russia and the United States have notoriously disparate interests regarding humanitarian intervention, military involvement, and globalization in the modern world. Our results did show a negative influence link between the two countries (in both directions), yet this negative influence was not as strong as we might have anticipated. The United States, France, and the United Kingdom, historically allies since the end of World War I and founders of the North Atlantic Treaty Organization (NATO) predictably had strong positive influence on each other. As predicted due to old communist ties, China's influence was strongest with Russia and the same was true vice versa however it will be noted that neither of those influences rivaled the electoral unity of the NATO countries. Ties between the NATO group and the China-Russia duo were weak and neither side significantly influenced the votes of the other (positively or negatively). Going into this experiment, the predictability of Security Council voting was a large unknown however, after our influence values accurately showed countries playing their best responses 94% of the time, it is clear that regardless of the issue, certain countries are likely to vote very similarly. This allowed us to, when given hypothetical voting records for the rest of the permanent council members, accurately predict the vote of any member.

8 REFERENCES

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