Mining Sentiments and Arguments in United Nations Security Council (UNSC) Speeches

Exploring sentiment and argumentation pipelines in the UNSC political speech corpus detailed in Schönfeld et al. (2019)

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Abstract

The UNSC political speech corpus was released in late 2019 with the publication of Schönfeld et al. (2019). The corpus contains ∼65,000 speeches from ∼5,000 security council meetings over the years of 1995-2017. As a result, it represents a comprehensive corpus which can be utilized for sentiment and argumentation mining. This project will explore the applications of various sentiment and argumentation mining pipelines into this newly released dataset.

1 Project Description

Here, we present a preliminary project description with ranked preferences of techniques that we could use to mine the UNSC political speech corpus. As this project is exploratory in nature, some of these methods might be changed with future iterations of research. We will be publishing our work and source code in a public GitHub repository.[1]

1.1 Sentiment Mining

In order to conduct sentiment mining into the UNSC corpus, we aim to test multiple pre-developed sentiment analysis frameworks and compare their results on the UNSC corpus. Some of the approaches we could test are outlined below.

1.1.1 Lexicoder Sentiment Dictionary (LSD)

This is a lexicon[2] designed to capture the sentiment of political texts. This could be a good starting point; definitely more specific than other lexica but maybe rather appropriate for evaluating politics on national level. Some issues are not discussed at the international/UN level; such as wages, coalitions and pensions.

1.1.2 VADER

VADER is a rule-based sentiment analysis tool that is specifically attuned to sentiments expressed in social media (Hutto and Gilbert, 2015). It might be limited since the tool is optimized for social media sentiment analysis. We could attempt to improve the functionality of VADER using the aforementioned LSD.

1.1.3 TextBlob

This is a library[3] built on top of NLTK. It brings in subjectivity as an interesting feature in addition to sentiment. Sentiment ranges between -1.0 and 1.0, where -1.0 is the most negative, 0.0 is neutral and 1.0 is the most positive sentiment value. Subjectivity is within the range 0.0 to 1.0 where 0.0 is very objective and 1.0 is very subjective. This might be interesting for classifying spontaneous speech, as it might be less subjective.

[1] https://github.com/atreyasha/sentiment-argument-mining
[2] http://www.lexicoder.com/
[3] https://textblob.readthedocs.io/en/dev/

1.2 Argumentation Mining

As per our discussions, it would be good if we could attempt a downstream task of classifying spontaneous and prepared speech segments. However, in order to achieve this downstream task, we would need to work on breaking the speeches down into their respective argumentation structures. Following are two ranked approaches in terms of decreasing preference.

1.2.1 Joint Pointer Neural Architecture

In order to break the UNSC speeches into smaller claims and premises, we could use a joint pointer architecture proposed by Potash et al. (2016). Although the authors did not publicly release their source code, this architecture was previously emulated by students from the University of Potsdam.[4] As a result, the source code for this architecture has been made publicly available.

In order to train this neural network, it would be best to use claims and premises which are relevant to political speeches. For this, we could use US election debate corpus[5] which has been summarized in Haddadan et al. (2019). This corpus is already annotated for premises and claims. We could train a joint pointer neural network and compare the classification results against that of baseline models in the paper.

Following this, we could extend the application of the trained joint pointer neural network to the UNSC political speech corpus. As a downstream task, identifying potential claims/premises would require basic filtering using discourse connectives, and we could further analyze this aspect.

1.2.2 Political-Domain Ontology

The aforementioned joint neural network solution would only provide an approximate solution to this problem of argumentation mining, particularly due to lack of a global ontology for the political domain. A lower ontology designed for the political domain would be very helpful in setting up a proper knowledge base which could be much more scalable and interpretable than machine learning solutions.

However, this would be very costly and generally difficult to do. Some papers have attempted making ontologies, for example in the medical/cancer domain as per Groza and Popa (2016), with reasonable results. It would be interesting to pursue an ontology as it resembles a global solution to knowledge and argument representation.

[4] https://github.com/oguzserbetci/argmin2017
[5] https://github.com/ElecDeb60To16/Dataset

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