

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

"Exploring the UNSC political speech corpus"

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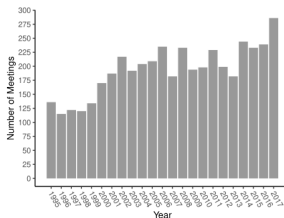
Introduction: UNSC Corpus

| Country | Speaker | Participant_Type |
|----------------|---------------------|------------------|
| China | Mr. Wang Xuexian | Mentioned |
| Germany | Mr. Henze | Mentioned |
| Japan | Mr. Owada | Guest |
| Malaysia | Mr. Thanarajasingam | Guest |
| Argentina | Mr. Cardenas | The President |
| Czech Republic | Mr. Kovanda | The President |
| Argentina | Mr. Cardenas | The President |
| Turkey | Mr. Giiven | Guest |
| Botswana | Mr. Merafhe | The President |
| Botswana | Mr. Merafhe | The President |
| Oman | Mr. Al-Khussaiby | Mentioned |
| Botswana | Mr. Merafhe | The President |
| Oman | Mr. Al-Khussaiby | The President |
| Honduras | Mr. Martinez Blanco | The President |
| Germany | Mr. Kaul | Mentioned |

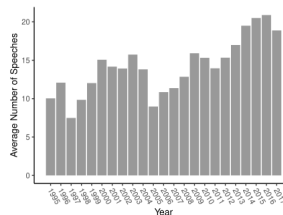
Figure 1: Example structure of a UNSC speech

- The UNSC political speech corpus was released in Schönfeld et al. (2019)
- In total, the corpus contains 65,393 speeches extracted from 4,958 meeting protocols of the United Nations Security Council
- Metadata includes speech date, speaker, country, role in the UN and the participant type (president, mentioned, guest)
- In addition, information about the topic and the number of types, tokens and sentences in the speech is provided

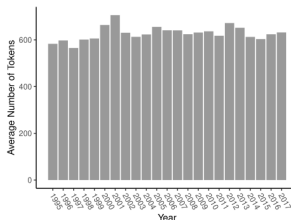
Introduction: UNSC Descriptive Statistics



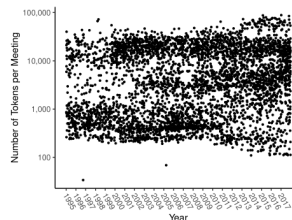
(a) Numbers of meetings per year



(b) Average number of speeches per meeting



(a) Average number of tokens per speech per year.



(b) Tokens per meeting – logarithmic scale.

Figure 2: Descriptive statistics of the UNSC corpus; adopted from Schönfeld et al. (2019)

Objectives

- **General objective:** Explore mining various components of the unannotated UNSC political speech corpus
- **Approach 1:** Using sentiment and subjectivity analysis
- **Approach 2:** Mining argumentation structure of speeches
- **Possible downstream task:** Using mined components to investigate whether given speech segments were spontaneous or planned

Methodologies: Sentiment Analysis I

Methods:

- Test multiple pre-developed sentiment analysis frameworks and compare their results on the UNSC corpus
- Expand the scope to subjectivity analysis
- Combine frameworks or improve them using domain-specific lexica

Possible research questions:

- Does countries' sentiment change over time?
- How diplomatic is the UNSC? - Do humanitarian crises affect the sentiment and subjectivity of council speeches?
- Are sentiment and subjectivity cues for spontaneous and planned speech in the UNSC?

Methodologies: Sentiment Analysis II

- *Vader* and *TextBlob* for comparative sentiment analysis ($[-1,1]$ from negative over neutral to positive)
- *TextBlob* for subjectivity analysis ($[0,1]$ from objective to subjective)
- Sentiment scores differ among frameworks

| Vader Sentiment | TextBlob Sentiment | Subjectivity |
|-----------------|--------------------|--------------|
| 0.838 | 0.166 | 0.425 |

Figure 3: Average sentiment/subjectivity scores for UNSC speeches in 1995

Preliminary Results: Sentiment Analysis I

1

The President: I thank the representative of Indonesia for the kind words he addressed to me.

| Country | Speaker | Vader_Sent | Blob_Sent | Subjectivity |
|---------|-----------|------------|-----------|--------------|
| Italy | Mr. Fulci | 0.71 | 0.6 | 0.9 |

Figure 4: Example sentiment/subjectivity scores for short UNSC text

2

I apologize for speaking, but I wish to address the statement [...]. It is not my habit to address such gratuitously unpleasant comments [...], but I believe that for once I am obliged to do so. [...] But what does it really matter now? All this is trivial and has nothing whatever to do with the goal of this meeting, [...].

| Country | Speaker | Vader_Sent | Blob_Sent | Subjectivity |
|---------|-------------|------------|-----------|--------------|
| France | Mr. Ladsous | 0.98 | 0.12 | 0.36 |

Figure 5: Example sentiment/subjectivity scores for long UNSC text

Preliminary Results: Sentiment Analysis II

- Subjectivity classification reveals unusual scores for short spontaneous speeches (example: 0.9, average: 0.425)
- Does not catch the subjectivity of longer speeches
- **Assumption:** Formal or unusual vocabulary and syntax may affect the performance of the classifiers
- **Possible solutions:**
 - Improve pre-processing (e.g. identify common stop words)
 - Use domain specific lexica (e.g. *Lexicoder Topic Dictionaries*, *Subjective Verbs Lexicons*)
 - Use a more sophisticated sentiment/subjectivity measure (e.g. pre-trained machine learning models)

Methodologies: Argumentation Mining

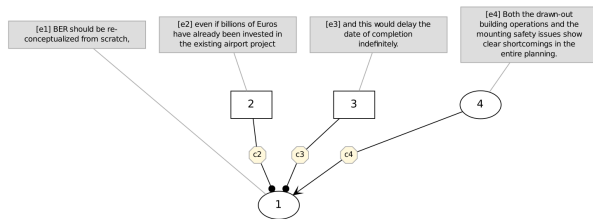


Figure 6: Example of a complete argumentative structure of a short text (Peldszus and Stede, 2015)

- Argumentation structure requires claims and premises
- Claims and premises are usually assembled into a tree structure
- Specify support/attack nature of claims and premises

Methodologies: Potash et al. 2016

First, [cloning will be beneficial for many people who are in need of organ transplants]_{AC1}. In addition, [it shortens the healing process]_{AC2}. Usually, [it is very rare to find an appropriate organ donor]_{AC3} and [by using cloning in order to raise required organs the waiting time can be shortened tremendously]_{AC4}.

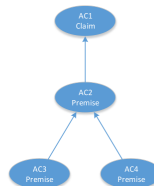


Figure 7: Simplified argumentation structure in Potash, Romanov, and Rumshisky (2016)

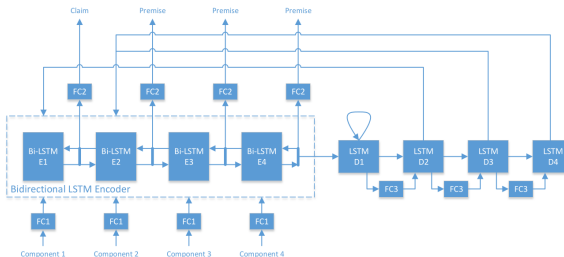


Figure 8: Joint self-attention pointer network developed in Potash, Romanov, and Rumshisky (2016)

Methodologies: Application on UNSC dataset I

1 Joint pointer neural network (Potash, Romanov, and Rumshisky, 2016)

- State-of-the-art results, but excludes attack/support
- Assumes claim/premise candidates are provided in a span
- **Extra pipeline needed to identify argument candidates**

2 Training dataset

- Microtext corpus (Peldszus and Stede, 2015)
⇒ short texts and lack of domain knowledge
- **US election debate corpus (Haddadan, Cabrio, and Villata, 2019)** ⇒ new corpus in political domain, but occasional inaccurate annotations¹
- **Persuasive essay corpus (Stab and Gurevych, 2017)**
⇒ medium length formal essays with accurate annotations

¹<https://github.com/ElecDeb60To16/Dataset/issues/2>

Methodologies: Application on UNSC dataset II

$$\text{Let } \mathbf{X} = [\textit{The, world, is, nice, thus, I, am, happy}] \quad (1)$$

$$\mathbf{Y}_1 = f_1(\mathbf{X}) = [1, 1, 1, 1, 0, 1, 1, 1] \quad (2)$$

$$\mathbf{Y}_2 = f_2(\mathbf{X}) = [-1, -1, -1, -1, 0, 1, 1, 1] \quad (3)$$

- Identifying argument candidates corresponds to a *seq2seq* task
- Input \mathbf{X} can be transformed to arbitrary argument candidates \mathbf{Y}_1
- Input \mathbf{X} can be jointly transformed to specific argument candidates \mathbf{Y}_2 , or alternatively to higher order argument structures such as a tree
- Leverage on recent developments in *seq2seq* pipelines
⇒ Transformers, BERT pre-trained encoders

Outlook

- 1 Develop more consistent sentiment analysis tools for the UNSC corpus
- 2 Apply trained argumentation classifier (single or multi-task) onto corpus
- 3 Develop an evaluation strategy for results:
 - Crowd sourcing to rate automatic annotations
 - Manual annotation of representative subsets of corpus

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