

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

"Exploring the UNSC political speech corpus"

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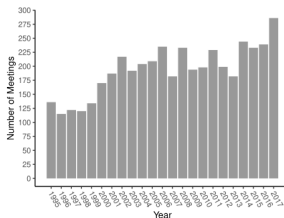
# Introduction: UNSC Corpus

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

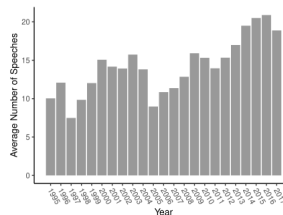
**Figure 1:** Example structure of a UNSC speech

- The United Nations Security Council political speech corpus was released in Schönfeld et al. (2019)
- The corpus contains 65,393 speeches extracted from 4,958 UNSC meeting protocols
- 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

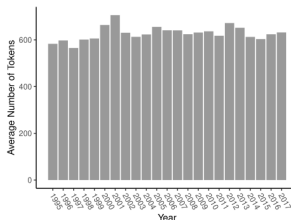
# Introduction: UNSC Descriptive Statistics



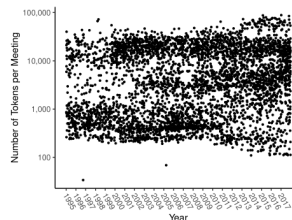
(a) Numbers of meetings per year



(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

## Used so far:

- *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

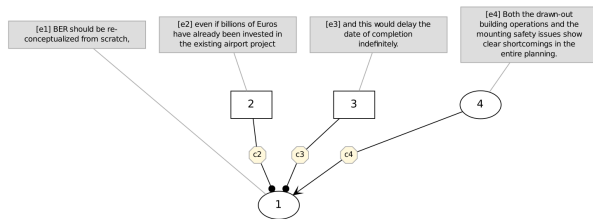
Figure 5: Example sentiment/subjectivity scores for long UNSC text



# 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

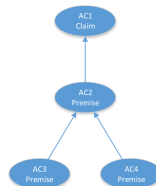


**Figure 6:** Example of a complete argumentative structure of a short text (Peldszus and Stede, 2015)

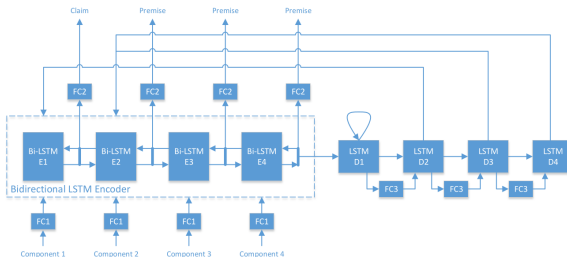
- Argumentation structure requires claims and premises
- Claims and premises are usually assembled into a tree structure
- Specify support/attack nature of claims and premises

# Methodologies: Potash et al. 2016

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



**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 annotations<sup>1</sup>
- **Persuasive essay corpus (Stab and Gurevych, 2017)**  
⇒ medium length formal essays with accurate annotations

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

# Methodologies: Application on UNSC dataset II

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

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

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

- 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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