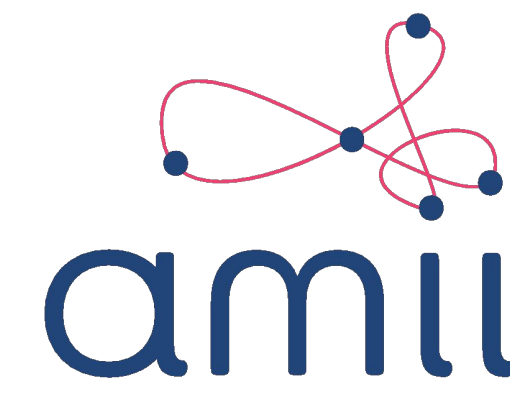


# Identifying Emotional and Polar Concepts via Synset Translation

Logan Woudstra, Moyo Dawodu, Frances Igwe, Senyu Li, Ning Shi, Bradley Hauer, Grzegorz Kondrak



UNIVERSITY OF ALBERTA



Alberta Machine Intelligence Institute

## Emotional and Polar Texts

**Polarity Classification:** Classify the polarity of a piece of text (*positive, negative, or neutral*).

**murder** → *negative*

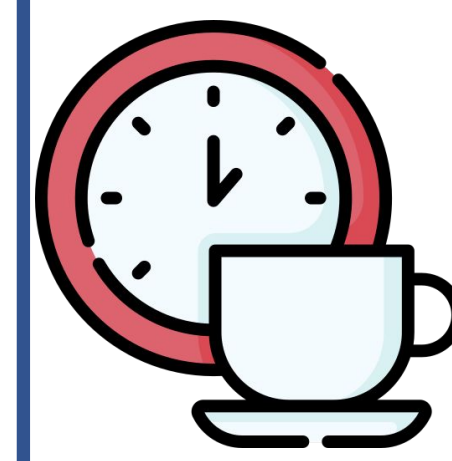
**Emotion Identification:** Identify the emotion(s) associated with a piece of text from from a predefined emotional inventory (*anger, anticipation, disgust, fear, joy, sadness, surprise, and trust*).

**murder** → *anger, fear, sadness*

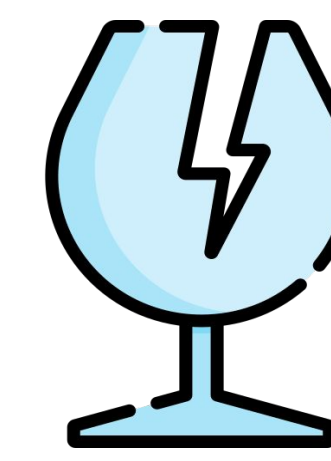
While emotion identification is more informative than polarity classification, it is also more subjective.

## Sense-Level Sentiment

Assigning sentiments to words is ambiguous, as words can have multiple senses. These senses of **break** have opposing sentiments.



To pause doing something (as work)

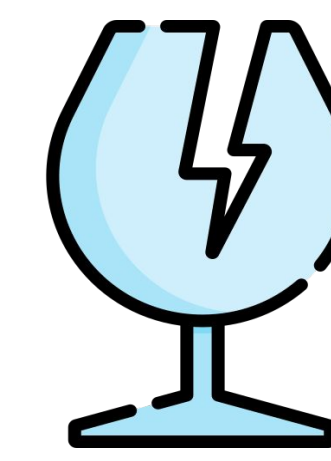


To separate into pieces or fragments

Translating senses into other languages and finding the sentiment of the translated words in multilingual lexicons can resolve the ambiguity.



Dutch Translation: pauzeren  
→ anticipation  
→ positive



Dutch Translation: begeven  
→ sadness  
→ negative

## Multilingual Method

### English Synset

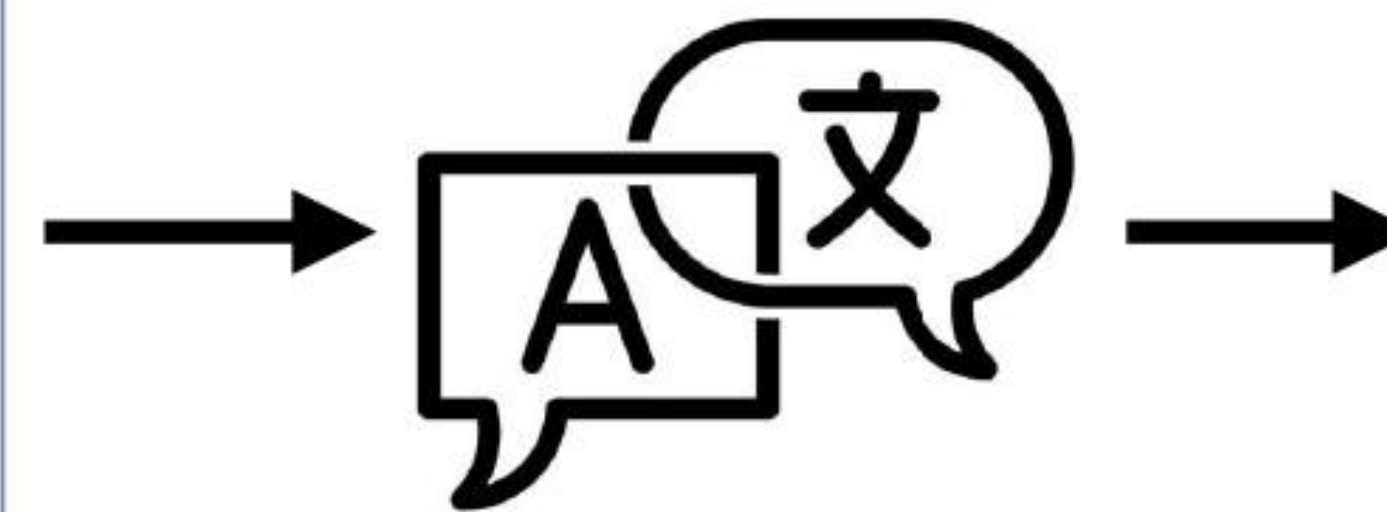
Gloss: marked by intense convictions; inclined to react violently

Part of Speech: adjective

Lemmas and Associated Sentiments:

- fierce: {anger, fear}, {negative}
- vehement: {anger, fear}, {negative}
- violent: {anger, surprise}, {negative}

### Translation Source



### Translations

Finnish: {hurja, kiihkeä}  
French: {véhément}  
German: {vehement, heftig}  
Indonesian: {kuat, hebat}  
Russian: {рьяный, неистовый}  
Slovenian: {silovit}  
Spanish: {violento, feroz}

### Emotion Prediction

Confidence Score: 0.71  
Predicted Emotion: fear

### Polarity Prediction

Confidence Score: 0.71  
Predicted Polarity: negative

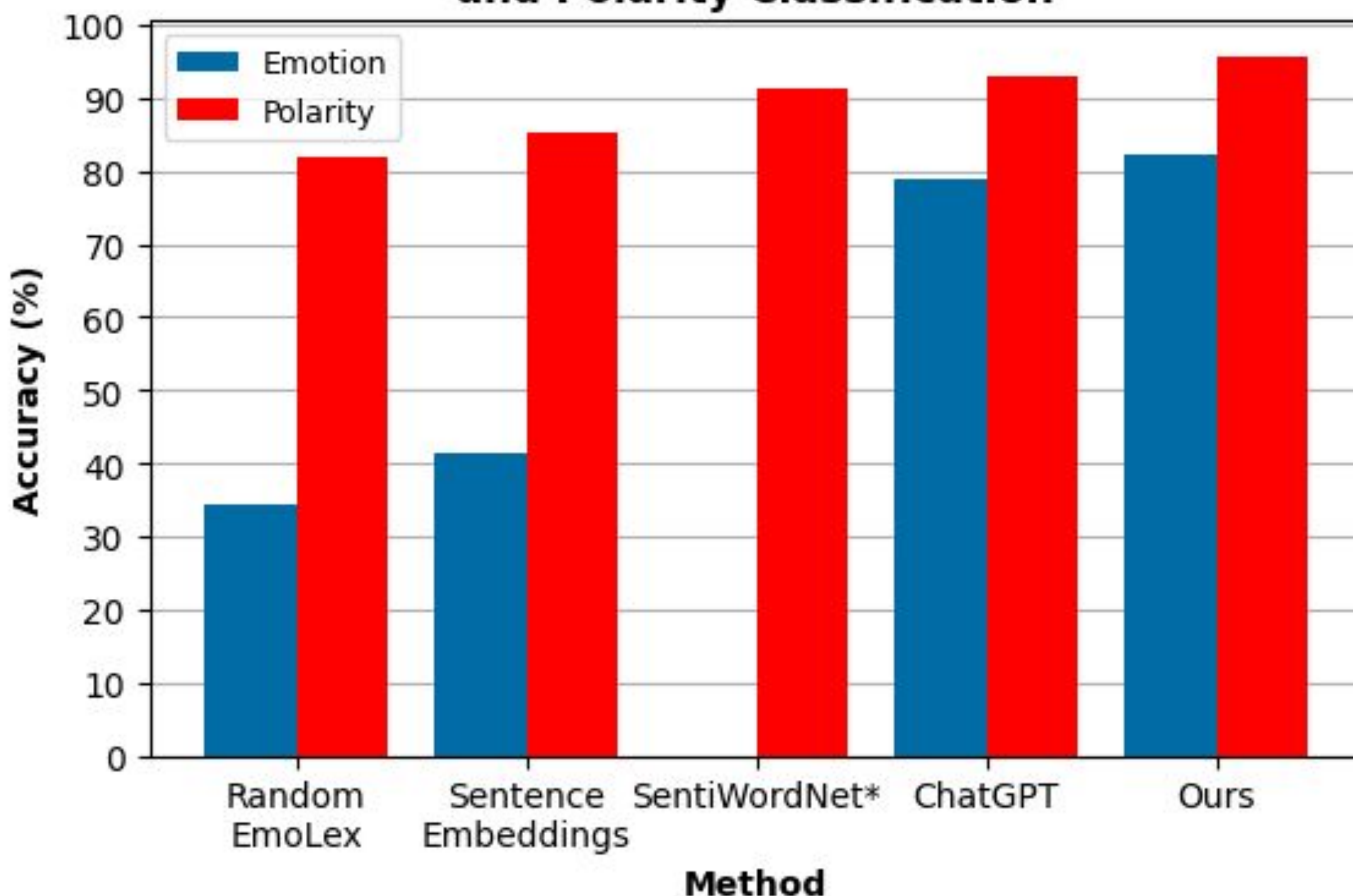
Language	Emotions	Polarities
Finnish	{fear, anger}	{negative}
French	{fear, anger}	{negative}
German	{fear, anger}	{negative}
Indonesian	{joy, trust}	{positive}
Russian	{fear, surprise}	{negative}
Slovenian	{}	{}
Spanish	{fear, anger}	{negative}

### Multilingual Sentiment Lexicons



## Experimental Results

Performance in Emotion Identification and Polarity Classification



\*SentiWordNet only assigns polarity labels, not emotion labels

## SentiSynset Overview

1. Apply the multilingual method to all 117,659 WordNet synsets, obtaining our core senses.
2. Utilize sentiment-preserving WordNet relations to extend our core and propagate sentiment labels.

The result is SentiSynset, a sense-level sentiment lexicon larger than comparable resources, containing **12,429** emotional synsets and **15,567** polar synsets.

## Conclusion

- Leveraged multilinguality to develop an **automatic** method that assigns emotional and polar labels to word-senses.
- Created SentiSynset, a sense-level sentiment lexicon that is **significantly larger** than comparable resources.
- Labels assigned by our automatic method have **high-precision**.

[github.com/UAlberta-NLP/SentiSynset](https://github.com/UAlberta-NLP/SentiSynset)