Politics of emotions or propaganda?

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1 Introduction

This project explores how emotional language is used in political texts to influence perception and manipulate audience response. The data analyzed in the project is the transcription of US 2020 Presidental Debates available on Kaggle[1].

Emotion classification models based on pre-trained BERT architectures have been shown to outperform other approaches (Hsu and Ku, 2018[2]). To obtain emotion annotations, the DistilBERT Classifier[3] was fine-tuned using some techniques and methods discussed in 'GoEmotions: A Dataset of Fine-Grained Emotions'[4].

2 Research question and methodology

Emotional language is a powerful tool in political speeches, used to persuade, mobilize, and connect with audiences on a deeper level. For example, words evoking fear or anger create a sense of urgency, while disapproval and guilt can create negative impressions of opponent's views.

This project aims to analyze the emotional language used by Donald Trump and Joe Biden in their speeches during the 2020 U.S. Presidential Election. Precisely, each candidate uses distinct communication strategies tailored to their target audiences, seeking to evoke specific emotional responses and strengthen their position.

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[1] US 2020 Presidental Debates:
https://www.kaggle.com/datasets/headsortails/us-election-2020-presidential-debates
[2] https://doi.org/10.18653/v1/W18-3505
[3] https://keras.io/keras$_hub/api/models/distil_bert/distil_bert_text_classifier/$
[4] https://arxiv.org/abs/2005.00547

2.1 Analysis methodology

The approach used comprises of building emotional profiles: the quantitative characteristic of how often different emotions(sentiments) used in the speech. Specifically the analysis focuses on:

- emotional profile during a specific debate event;
- comparison of emotional profiles across different debate events;
- emotion flow throughout a single event;
- emotion distribution by topic.

2.2 Model training

As part of the project, an emotion classification model was developed. The model is based on the pre-trained DistilBERT architecture, fine-tuned using the GoEmotions dataset.

The GoEmotions dataset consists of 58,000 Reddit comments, each labeled with one or more of 27 emotions or marked as Neutral, making it a multi-label classification task. Exploratory data analysis showed that the dataset is imbalanced. To address this, severely underrepresented classes were excluded, and only those emotions relevant to political discourse were retained—resulting in a set of 19 emotion classes.

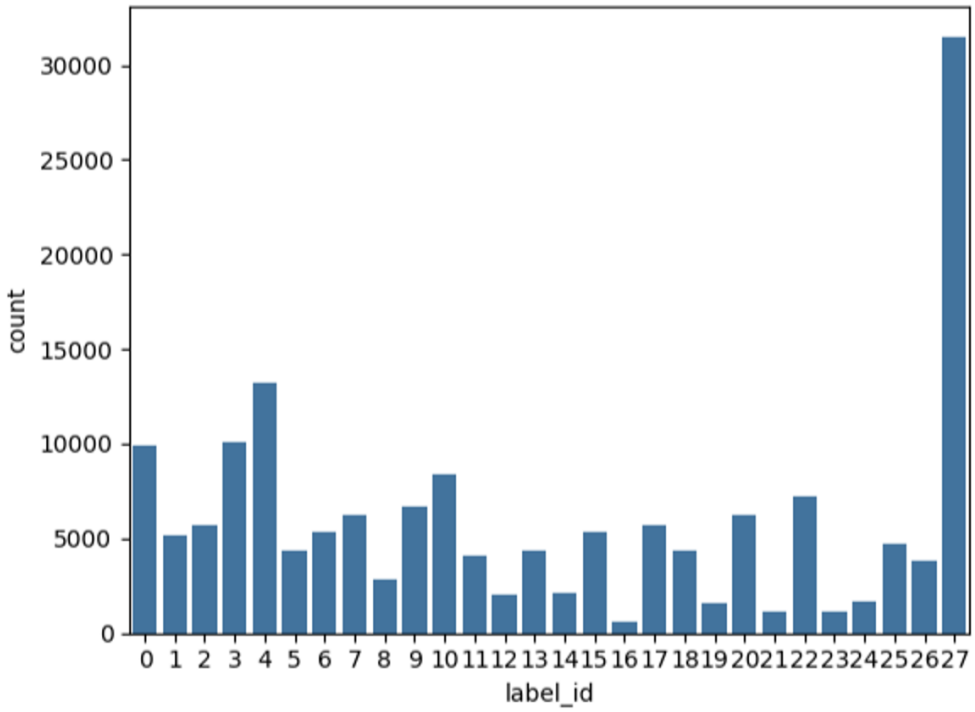

Fig. 1 Original class distribution in GoEmotions dataset

The model training parameters and performance metrics are summarised in Table 1.

Table 1 Model training parameters and performance metrics

Optimizer	Adam
Learning Rate	1e-5
Number of epochs	2
Accuracy	0.29

The resulting accuracy can be considered reasonable given the complexity of the problem:

- multi-classification problem with 19 classes;
- imbalance of the dataset;
- emotional tone is subjective and each text can be classified differently by different experts.

The classification confusion matrix is shown in Figure 2.

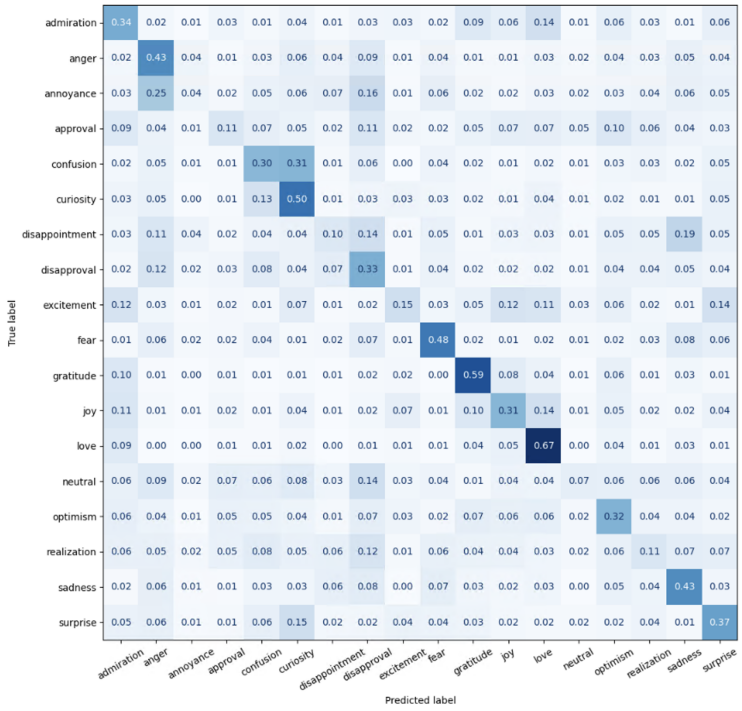

Fig. 2 Confusion matrix of the classifier