

# Team 18: Natural Language Processing with Disaster Tweets

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Section: 2

## 1 Introduction

Twitter, now known as X, is a widely used platform for sharing real-time updates. People use this platform to share their recent works, life updates as well as emergency situations like political unrest, mass violence, or natural disasters. Hence, it is crucial to identify whether a tweet is addressing an ongoing disaster. This is where the purpose of this project lies, detection of disaster-related content in tweets by utilizing natural language processing.

## 2 Data

The data used for this text classification task has been collected from an ongoing Kaggle competition (<https://www.kaggle.com/competitions/nlp-getting-started/data>). The initial data has 5 columns: id, keyword, location, text and target. Among these, only the text and target column were selected for further pre-processing and simplification of the task. The data belongs to two classes, positive for text denoting disaster and negative for denoting no disaster.

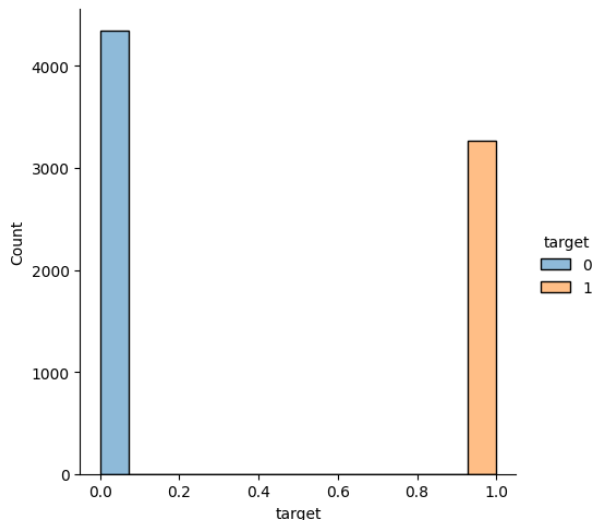


Figure 1: Classwise Data Distribution

## 3 Model

A Bidirectional Long Short Term Memory (Bi-LSTM) model was used for the classification task.

Table 1: Model Summary

Layer (type)	Output Shape	Param #
embedding_3 (Embedding)	(None, 31, 300)	4,704,900
bidirectional_3 (Bidirectional)	(None, 256)	439,296
dropout_3 (Dropout)	(None, 256)	0
dense_7 (Dense)	(None, 1)	257

## 4 Results

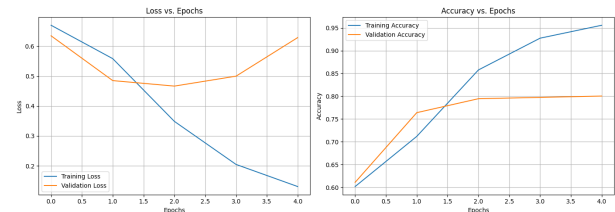


Figure 2: Validation Accuracy and Loss

## Conclusion

This project successfully developed a disaster classification model utilizing Natural Language Processing techniques to analyze tweets. By employing GloVe embeddings with a Bidirectional LSTM architecture, the model effectively captured contextual information and semantics within the text data. The results demonstrated promising accuracy in classifying tweets into disaster-related categories, highlighting the potential of leveraging social media data for timely disaster response and management.

## Acknowledgements

1. *(Text Messages Classification using LSTM, Bi-LSTM, and GRU)*

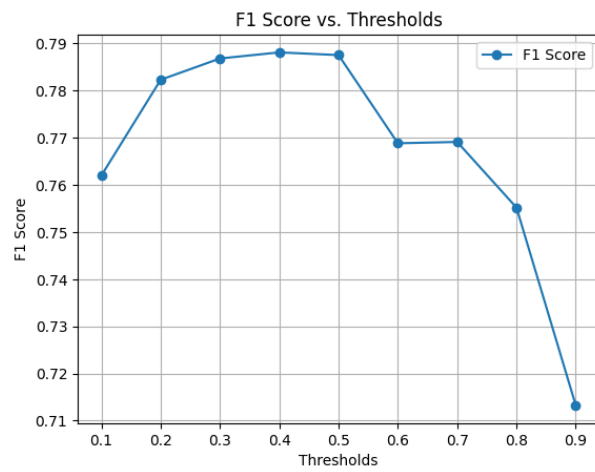


Figure 3: F1-Score

## 2. *(Practical Text Classification With Python and Keras)*