

# Depression Detection From Bangla Social Media Text Using Long Short Term Memory

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**Abstract**—In the paper, we propose an idea of depression classification from Bangla text using Long Short Term Memory (LSTM) classifier. At first, data will be collected and various steps of pre-processing will be performed on it. Then, the data will be passed through Machine Learning classifier for classification purpose. In the proposed paper, we have also mentioned the potential limitations and challenges of our work.

## I. INTRODUCTION

In the modern era, we tend to express our positive and negative emotions through social media websites such as Youtube, Twitter, Reddit, and so on. Depressive emotions are usually outlined as negative emotions which can be abundantly found in social media. Therefore, depression detection from social media texts can lead us to find depressed people who then can be supported by the others. Our approach will lead to depression detection from social media data. In this work, we will focus on detection from Bangla language using Long Short Term Memory (LSTM). [1]

The section II of the proposed paper describes the literature review, section III represents the data collection procedure, section IV has the proposed model, section V describes the limitations and the paper ends with section VI, the conclusion.

## II. LITERATURE REVIEW

There have been many researches in the past years for depression detection. For example, Al hanai et al. worked on depression detection from interview text using LSTM. Although there are many models like this built for English data, few researches have been done on Bangla texts. Hasib et al. performed depression detection from Bangla social media data in 2019. [2] However, works are few and far between in this particular field,

## III. DATA COLLECTION

Our plan is to develop and extensive Bangla dataset for our task. We plan to collect data from different social media platforms such as Facebook and Twitters using web scrapping. In order to achieve fast paced automated scrapping, automation tools such as selenium will be used. Most people tend to write Bangla in two ways: they either write Bangla using actual Bangla characters or they simply use English character to write Bangla. However, for the simplicity of process, we wish to have our dataset entirely written in Bangla characters. Therefore, the Bangla words written in English will be passed through a phonetic converter. Afterward, the pieces of texts

in the dataset will be labeled by professional psychologists as positive or negative. Additionally, we may use some automation during the labeling process to make the labeling task less time consuming and tedious. For example, when a sentence gets labeled by the professional, we will try to find similar sentences based on structure matching and will try to autolabel them.

## IV. PROPOSED METHOD

The workflow of our proposed model is given in fig 1.

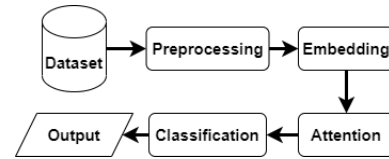


Fig. 1. Proposed Model

### A. Preprocessing

The preprocessing stage helps to clean, format and organize the raw data that we acquire from social media and make it ready to pass through the embedding stage.

### B. Embedding

The embedding stage transforms text into a numerical representation where semantically similar words have similar values. We plan to experiment with three different embedding techniques which are Word2Vec Embedding, [3] Glove Embedding, [4] FastText Embedding, [5] in addition to pre-trained transformers such as BERT, RoBerta, DistilBert and XLNet.

### C. Attention

This stage enables the classification to give more attention on depressive words by creating an attention vector. We plan to experiment with two different attention mechanisms, self attention and global attention. Self attention will help our model to learn the correlation of words between the posts and the previous part of the sentence whereas global attention emphasizes on the whole sentence. This enables feature extraction straight forward with less preprocessing.

#### D. Classification

In the classification stage we experiment with LSTM classifier which is a type of recurrent neural network. This classifier is suitable for our experiment as it is capable of learning order dependence in sequence prediction problems. It is an upgrade to the RNN as it solves the problem of gradient vanishing and exploding problem of the classifier.

#### V. LIMITATIONS AND CHALLENGES

First of all, people write Bangla language using English characters too, which can be difficult to deal with. Secondly, usage of emojis may lead to ambiguity in text sentiment as smileys are often used in sarcastic sense under depressing circumstances.

#### VI. CONCLUSION

In the proposed paper, our goal is to detect depression in Bangla language from social media texts using state of the art approaches. Although there are limitations, it can be dealt with future developments of this experiment.

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