EmojifyText - Project Description

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1 Problem Statement

Build a deep neural network to classify emotions (happy, sad, etc.) from the text.**NOTE**: To make the problem more interesting, I have extended it to output the emojis instead of emotions.

2 Data Preparation

1. The dataset is collected from exercises of the Sequence Models course on Coursera. The original dataset includes **188 phrases** with **5 classes** (denoted as **N_CLASSES**) as visualized below.

2. The dataset is divided as follow.

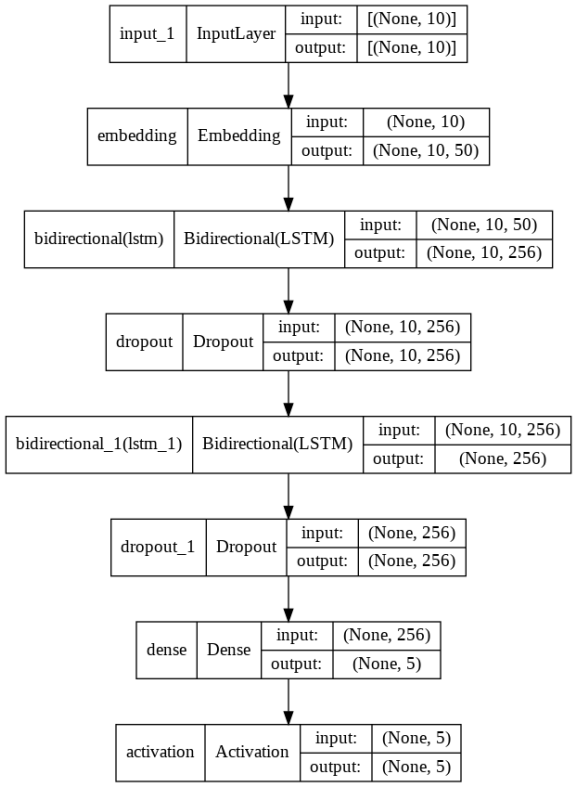
Table 1: Training and testing dataset preparation

Dataset	No. of phrases	Ratio
Training	150	80%
Testing	38	20%
Total	188	100%

3. The maximum sentence length (denoted as **MAX_SENTENCE_LEN**) in the dataset is 10.

3 Model Explanation

1. A simple **BiLSTM** architecture is used for this model. Also, the **GloVe-6B-50d** [1] pretrained embedding vectors (trained on 6B tokens and 50 dimensional feature vectors) will be used for the embedding layer. The overall architecture is described in the figure below.



2. The **dropout technique** [2] is used to help prevent the model from being overfitted and the dropout percentage was set to 0.3 in this project.

3. The activation function used in the last dense layer is the **softmax function** since there are 5 classes in the dataset. The softmax function can be calculated as:

$$softmax(z_i) = \frac{\exp z_i}{\Sigma_j \exp z_j}$$

4. The **Categorical Crossentropy** loss function will be used since there are more than 2 classes.

5. Also, the learning algorithm being used is **Adam** [3].

References

[1] Jeffrey Pennington, Richard Socher, and Christopher D. Manning. Glove: Global vectors for word representation. In *Empirical Methods in Natural Language Processing (EMNLP)*, pages 1532–1543, 2014.

[2] Nitish Srivastava, Geoffrey Hinton, Alex Krizhevsky, Ilya Sutskever, and Ruslan Salakhutdinov. Dropout: A simple way to prevent neural networks from overfitting. *Journal of Machine Learning Research*, 15(56):1929–1958, 2014.

[3] Diederik P. Kingma and Jimmy Ba. Adam: A method for stochastic optimization, 2017.