Mid-term presentation CL Team Lab

Group 9 Emotion Classification

Lara Grimminger, Jiwon Kim

14.06.2021

Emotion Classification

- International Survey On Emotion Antecedents And Reactions (ISEAR)
- Students asked to describe emotional events for 7 emotions including *joy*, *fear*, *anger*, *sadness*, *disgust*, *shame*, and *guilt*
  - *joy* - A party I went to last Christmas.
  - *disgust* - An Engineer I know wants war so he can get a job making bombs.
- Supervised Classification Task:
  Predict correct emotion given a text sequence from the data set

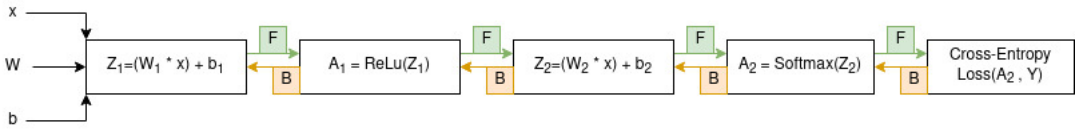
Simple Neural Networks and Data Preprocessing

- Neural Network as baseline because it is state-of-the-art architecture
- Simple 2 and 4-layer Neural Network to understand how architecture works

Data Preprocessing: tf_idf and One Hot Encoding

- tf-idf = Term frequency (tf) $*$ Inverse document frequency (idf)
  - $\star$ $\text{tf}_{t,d}$ of term t in document d is the number of times t occurs in d
  - $\star$ df_t is the number of documents that t occurs in
  - $\star$ $\text{idf}_t = \log_{10} \frac{N}{df_t}$, N is the number of documents in the data set
- One Hot Encoding
  - $\star$ *joy*$= [1,0,0,0,0,0,0,0]$, *fear*$= [0,1,0,0,0,0,0,0]$, *shame*$= [0,0,1,0,0,0,0,0]$, etc.

Graphic of 2-Layer Neural Network



Hyperparameters

- 2 and 4-layers architecture
- Tried 5, 10, and 20 epochs
- Each epoch with $0.01, 0.001, 0.0001, 0.00001$ as learning rates

Precision, Recall and F_1Score

Layers	Class	Precision	Recall	F_1Score
2-layer	Joy	.13	1.0	.23
	Fear	.00	.00	.00
	Shame	.00	.00	.00
	Disgust	.00	.00	.00
	Guilt	.00	.00	.00
	Anger	.00	.00	.00
	Sadness	.00	.00	.00
4-layer	Joy	.13	1.0	.23
	Fear	.00	.00	.00
	Shame	.00	.00	.00
	Disgust	.00	.00	.00
	Guilt	.00	.00	.00
	Anger	.00	.00	.00
	Sadness	.00	.00	.00

Std/mean value of each epoch

Conclusion and Future Work

- Problem: Our baseline predicts the same class regardless of hyperparameters
- *Can we improve the performance of the emotion detection method by converting the multi-class classification problem into a binary one?*
  - ⋆ Experiment 1:
    Have one classifier per emotion, e.g. joy vs rest
  - ⋆ Experiment 2:
    Have a classifier for a pair of opposite emotions, e.g. joy vs sadness