

Mid-term presentation CL Team Lab

Group 9 Emotion Classification

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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

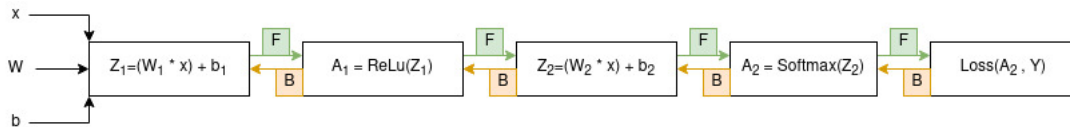
Data Preprocessing and Neural Network

- ▶ Convert text data to numerical data with tf_idf approach
- ▶ Convert text labels (i.e. the 7 emotions) to numerical data with one hot encoding
- ▶ 2-layer neural network with input layer, hidden layer, and output layer

Data Preprocessing: tf_idf and One Hot Encoding

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

2-Layer Neural Network



Training of the Neural Network

- ▶ Initialization with Kaiming (No exploding or vanishing weights and gradients)
- ▶ 2 Layers
- ▶ 1 Epoch
- ▶ Batchsize of 32
- ▶ Learning rate of 0.00001

Goals

- ▶ Detect emotion from text
- ▶ Evaluate classifier performance with F_1 Score
- ▶ F_1 Score is the harmonic mean of Precision and Recall

Precision, Recall and F_1 Score

Class	Precision	Recall	F_1 Score
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

Experiments

- ▶ Problem: Our baseline performs poorly
- ▶ *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