

Midterm presentation CL Team Lab

Group 9 Emotion Classification

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Task Description

Approach

Method

Architecture

Experimental Design

Results

Next steps

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

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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

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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



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2-Layer Neural Network

Forward-propagation

input layer: (n_data, n_features= 1000)

hidden layer:(n_features=1000, 7)

hidden layer to ReLu function

output layer: (n_data, 7)

output layer to softmax function

output to cross-entropy function(loss))

Backward-propagation

Get derivatives

Reverse steps from forward function

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Training of the 2-Layer Neural Network

- ▶ Initialization with Kaiming (No exploding or vanishing weights and gradients)
- ▶ 1 Epoch
- ▶ Batchsize of 32
- ▶ Learning rate of 0.01

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Precision, Recall and F_1 Score

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Advanced Classifier

- ▶ Tackle Curse of Dimensionality with Word Embeddings or PCA
- ▶ Add more layers (Universal Approximation Theorem)
- ▶ Change ReLu to another activation function
- ▶ Use optimizer