Dialog Act Classification

using Word Embeddings & Acoustic Features

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Task Introduction

- Dialog act classification is to label utterances with a specific category
- We present an approach using a convolution neural network (CNN)
- Classification of utterances in four different classes
  - statement
  - question
  - opinion
  - backchannel
- Two different inputs:
  - Lexical features
  - Acoustic features
- Examples:
  - What is your name? - Question
  - It's raining. - Statement

Data

Switchboard

- Subset of the Switchboard Telephone Speech Corpus
- The Switchboard Corpus has lexical and acoustic data
- The lexical dataset are divided in training-, development- and test-sets

Dataset\Channel	opinion	question	backchannel	statement	Sum
training	4984	2150	6792	14459	28385
development	1068	460	1455	3098	6081
test	1070	463	1458	3099	6090

- The acoustic dataset includes a recording of every utterance

MFCC features

- Extraction of the MFCC features for every sentence with OpenSmile
- Every 25ms the MFCC features where extracted, which resulted in 13 features for each measurement point

word2vec

- For the word embedding layer we used the pretrained Google word2vector model
  - It contains 3 million words and phrases with a 300-dimensional vector each

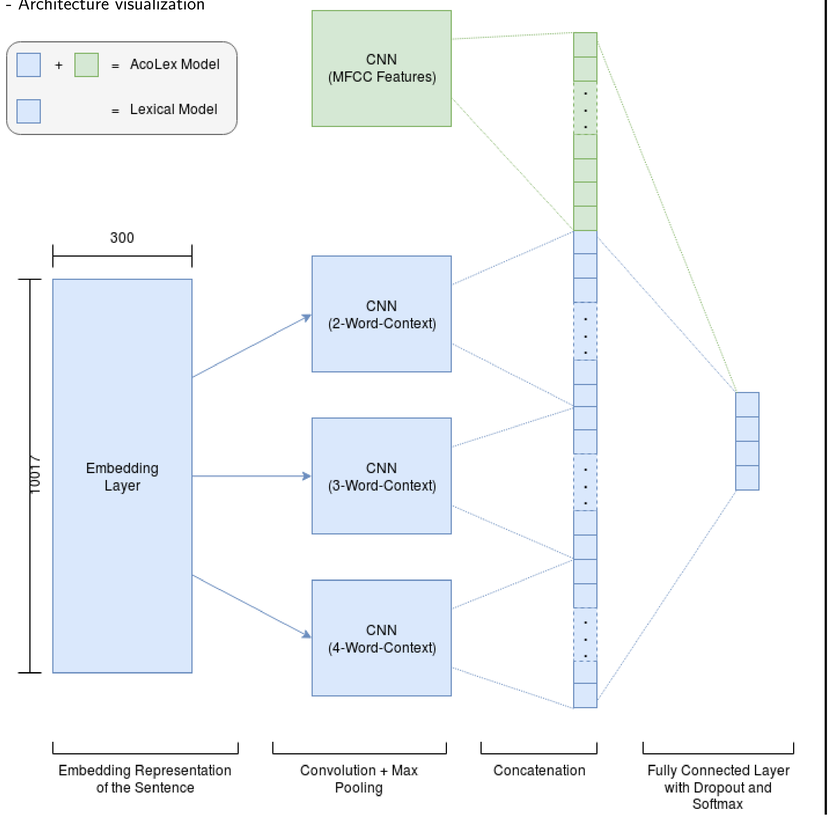
Data Preprocessing

1. All words from the three datasets are indexed in a word list for use in the embedding matrix
2. Each word in word list, from the training set, was given the corresponding vector from the word2vec model
3. A random vector is assigned if the word is not in the word2vec model or from the test and development set
4. Each sentence is converted to a sequence with the corresponding indexes from the word list

1. The MFCC feature matrix is reduced to the first 1000 and the last 1000 measurement points, which results in a 13 by 2000 matrix

System Architecture

- Architecture visualization



Intermediate Results

- Table with different configs and mean accuracies

epochs	learning rate	lexical model	acolex model
1	4984	2150	

Potential Future Work

- What we plan next:
  - Varying MFCC feature size
  - Including word2vec features for the test and development set
  - Implementation of an additional embedding layer between CNN output and output layer