MULTIMODAL SPEECH EMOTION RECOGNITION USING AUDIO AND TEXT

COMP8240 Group J Project Proposal

Jan Arvin Lapuz, Alyssa Lim, Le Van Nguyen, Ramil Zabala

September 1, 2020

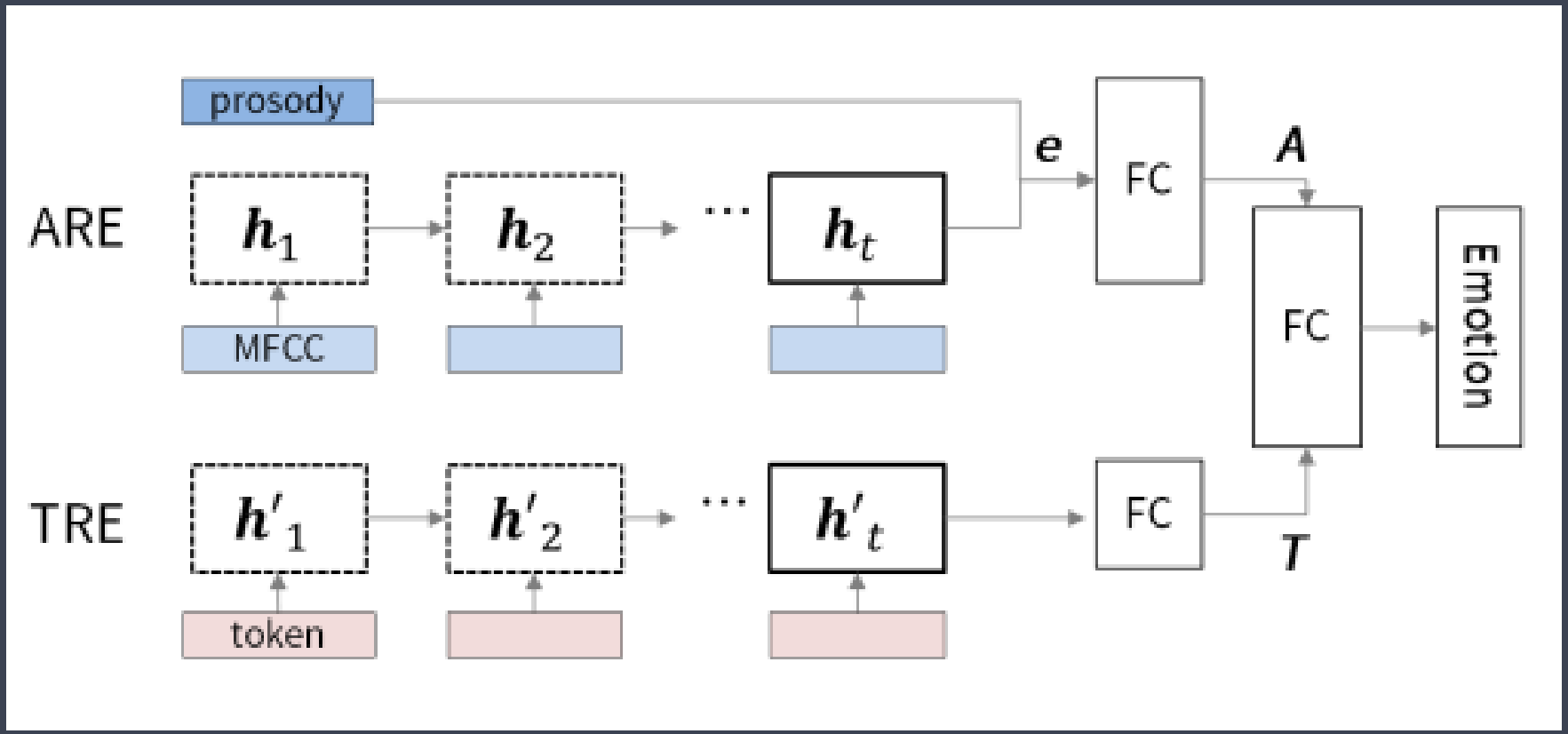
» Overview

- 2018 IEEE Spoken Language Technology Workshop (SLT)
- Seoul National University
  - Dept. of Electrical and Computer Engineering
- Deep Dual Recurrent Encoder Model
  - audio signals & text data
  - speech data » signal level » language level
  - emotion categories:
    - angry
    - happy
    - sad
    - neutral
  - accuracy: 68.8% to 71.8% (IEMOCAP dataset)
- CNN Long Short-Term Memory Neural Networks
  - speech recognition
  - natural language processing

» Specifications

Requirements	python 2.7
	nltk 3.3
	scikit-learn 0.20.0
	tensorflow 1.4
	Google ASR system
	OpenSMILE toolkit
Datasets	IEMOCAP dataset
	ASR system processes IEMOCAP audio data
Input Features	Mel-Frequency Cepstral Coefficients (MFCCs)
	Prosodoic Features
	Word Tokens

» Model



Multimodal Dual Recurrent Encoder (MDRE)

» Research Results

Multimodal Speech Emotion Recognition Results

Model	WAP
ARE	0.546 ± 0.009
TRE	0.635 ± 0.018
MDRE	0.718 ± 0.019
MDREA	0.690 ± 0.019
TRE-ASR	0.593 ± 0.022
MDRE-ASR	0.691 ± 0.019
MDREA-ASR	0.677 ± 0.013

Novel Models' Results

Model	WAP
ACNN	0.561
LLD RNN-attn	0.635
RNN(prop.)-ELM	0.628
3CNN-LSTM10H	0.688

» Timeline

Week 06	Data Capture
Week 07	Environment Installation and Testing
Week 08	Audio and Text Model Testing
Week 09	Complete Model Testing
Week 10	Reports Generation and Evaluation
Week 11	Results Documentation and Analysis
Week 12	Project Presentation