国際的研究活動促進研究費

RITSUMEIKAN UNIVERSITY

Dynamic Facial Features Associated with Positive Emotional Voice Stimuli for Detection of Depressive Symptoms

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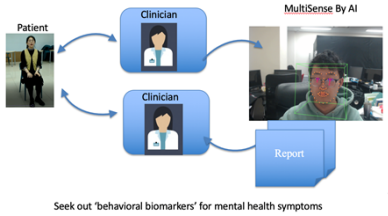
Introduction

Depression is widespread in the population and can negatively impact people's everyday lives in several ways .

Some deep learning methods have been proposed utilizing visual cues for depression analysis

we propose a deep learning model to extract and fuse dynamic facial features associated with positive emotion voice stimuli for detection of depressive symptoms. .



Proposed Method

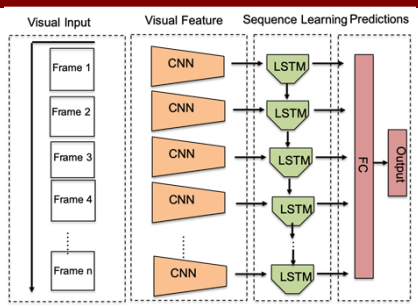


Fig. 2. Our proposed model consists of two-stage. The first stage is a pre-trained VGG-Face. Convolutional Neural Network. The second stage is a long short-term memory network. The length of the n depends on sentences, which range from 11 to 27

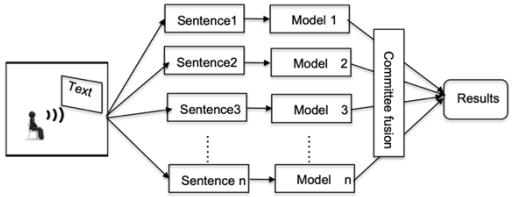


Fig. 3 The committee fusion architecture using different sentences.

Experimental results

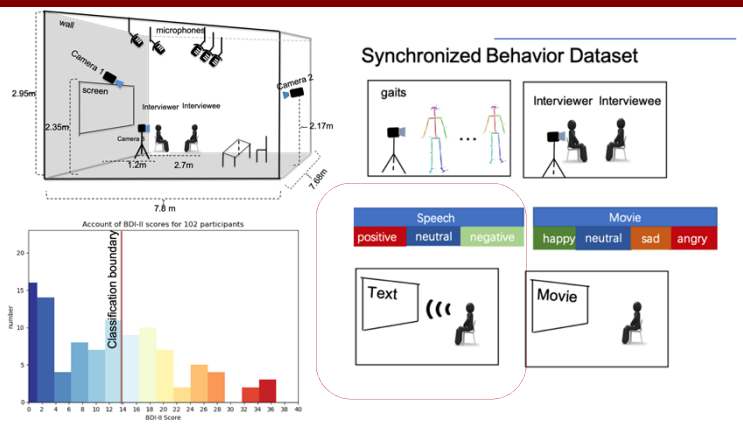
Table 1. Accuracy (%) for Depressive symptoms detection in single and multiple level

Sentence	Accuracy
1	71.4
2	66.7
3	57.1
4	76.1
5	61.9
6	71.4
7	66.7
Average	67.32 ± 6.39
Fusion	71.4

True Class		HP	DP
	HP	60%	40%
	DP	18.1%	81.9%
		HP	DP
		Prediction Class	

Fig. 4 Accuracy Analysis of test (HP donates healthy persons; DP donates depressive persons)

Database



Example of the word-level forced alignment

Start_time	Stop_time	Chinese character
0.3425	0.5625	盼
0.5625	0.7925	啊
0.7925	0.8425	short-pause
0.8425	1.0725	盼
1.0725	1.2425	啊
1.2425	1.3025	short-pause
1.3025	1.5625	眼
1.5625	1.9925	看
1.9925	2.2425	春
2.2425	2.4025	节
2.4025	2.5925	就
2.5925	2.8225	快
2.8225	3.025	到
3.025	3.1825	了
3.1825	3.6425	short-pause

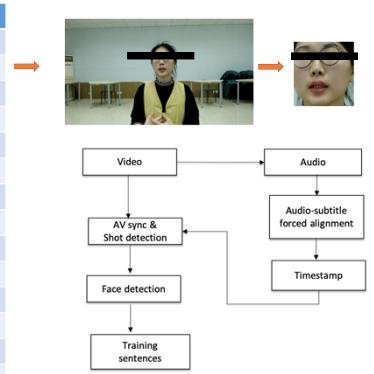


Fig. 1. Pipeline to generate the dataset.

List of positive emotional sentences

Sentence ID	Content written in Chinese (translate to English)	Range
No.1	盼啊！盼啊！眼看春节就快到了。 (Hope! Wish ah, see the Spring Festival is coming soon.)	1-12
No.2	想到这，我不由得笑了起来。 (Thinking about it, I couldn't help laughing.)	13-24
No.3	在春节前，人们个个喜气洋洋，个个精神饱满。 (Before the Spring Festival, people are all beaming, and in high spirt.)	25-42
No.4	逛街的人络绎不绝，有的在买年画，有的在买年货。 (People go shopping in an endless stream, some are buying New Year pictures, some are buying necessities)	43-62
No.5	有的围着火炉看电视，还有的人在打麻将打扑克等等，不一而足。 (Some were watching TV by the fire, others were playing mah-jongg and poker, and so on.)	63-88
No.6	大年三十，人们常常玩到深夜，嘴里啃着美味水果，手里燃放烟花爆竹。 (On New Year's Eve, people often play late into the night, eating delicious fruit and setting off fireworks in their hands.)	89-116
No.7	大人小孩都载歌载舞，忘情地玩个痛快。 (Adults and children are singing and dancing, and enjoy themselves)	117-132

Future work