网站

CK+

- 123个subjects
- 593个image sequence，每个image sequence的最后一张frame都有AU的label
- 593个image sequence中有327个sequence有emotion的label
- 每个序列的目标表达式都是完全FACS编码的
- 共有8个label：

  0=neutral, 1=anger, 2=contempt, 3=disgust, 4=fear, 5=happy, 6=sadness, 7=surprise

数据集包括四个文件夹

1. the images
   - 序列在峰值帧上编码为FACS
   - 所有的序列都是从从平静到表情表现峰值
2. the landmarks

   所有序列都用AAM跟踪，每个图像有68个地标。
3. The FACS code files
   - 每个序列只有一个FACS文件，即最后一帧(峰值帧)。
   - 文件的每一行对应一个特定的AU，然后是强度。
4. the emotion coded file
   - 593个序列中只有327个序列具有情感序列。
   - 与FACS文件一样，每个序列只有一个情感文件，即最后一帧(峰值帧)

OMG_Emotion

数据集链接

- 由420个相对较长的情绪视频组成，平均时长为1分钟，收集自Youtube多个频道
- 包括
- 共有7个label

  0 - Anger，1 - Disgust，2 - Fear，3 - Happy，4 - Neutral，5 - Sad，6 - Surprise

数据集包括：

1. omg_TrainVideos.csv

link	start	end	video	utterance	arousal
https://www.youtube.com/watch?v=CROcsl0llec	15.412683808758537	19.68286460425874	5b44393ed	utterance_4.mp4	0.1700912674029
https://www.youtube.com/watch?v=CROcsl0llec	21.250821615106467	36.796948573724386	5b44393ed	utterance_6.mp4	0.417668314388
https://www.youtube.com/watch?v=CROcsl0llec	37.13055644837284	45.33731016472479	5b44393ed	utterance_7.mp4	0.398645656332

	arousal	valence	EmotionMaxVote
	0.17009126740299998	-0.0236966881471	4
	0.417668314388	0.292946929716	3
	0.398645656332	0.325004309635	4

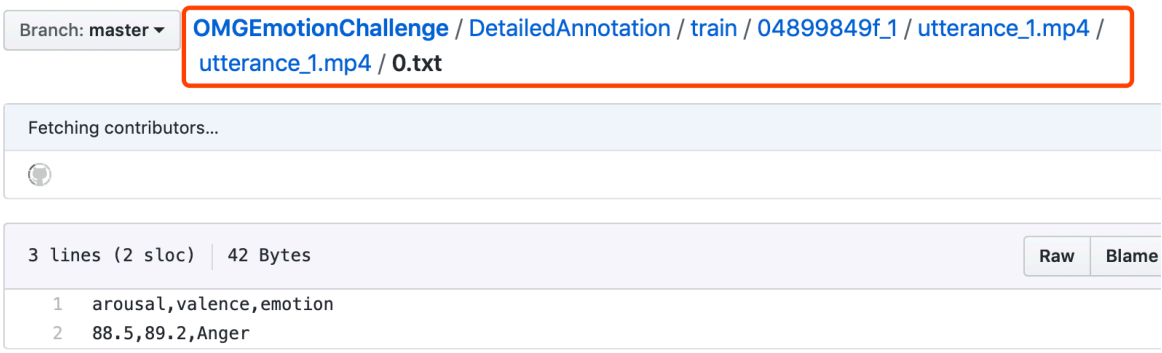
- link youtube该视频的链接
- start 视频的开始时间
- end 视频的结束时间
- video video的id，用来连接对应的annotations
- utterance 名字，用于连接对应的annotations
- arousal arousal的黄金标准
- valence valence的黄金标准
- emotionMaxVote 对所有注释进行投票产生的分类情绪

2. omg_ValidationVideos.csv

   同上

3. DetailedAnnotations

   标签



4. omg_TrainTranscripts.csv

	link	video	utterance	transcript
2	https://www.youtube.com/watch?v=CROcsl0llec	5b44393ed	utterance_4.mp4	hi I'm fine
3	https://www.youtube.com/watch?v=CROcsl0llec	5b44393ed	utterance_6.mp4	yeah I wasn't expecting you are to say hi quanah anything and I know v
4	https://www.youtube.com/watch?v=CROcsl0llec	5b44393ed	utterance_7.mp4	places in unhappy vampire can go for support

- link youtube视频的链接
- video video的id，用于和annotations进行连接
- utterance 名字，用于连接对应的annotations
- tanscript 每个视频的文字记录

5. omg_TestTranscripts.csv

   同上

数据集

情绪识别

dataset	形式	FACS	AU	subjects（female/male）	种族差异	sample	label	备注
CK+	image sequences	yes	yes	123(18-30yr)		593（327 with label）	8	
OMG_Emotion	video link			From 567 youtube videos		567	7	有音频
CE	images			230（130 /100）	大	5060	22	
DISFA	stereo video frames			27（12/15）		130000		每个图片有66个landmark points
JAFFE	images			60（60/0）	all Japanese	213	6	
BU-3DFE	images			100（56/44）		2500	6	3D human faces
B+	images			28		16128		576 viewing conditions
MMI	video sequences and still images			28（images：75）		326/2900	6	
AFEW	video sequences			220		957	7	with audio
Oulu-CASIA	image sequences			80		2880	6	

微表情

dataset	FACS	AUS	Subjects	Samples	Labels	种族
Polikovsky	yes		11	13	7	3
USF-HD	no	no		100	4	
YorkDDT	no	no	9	18		
CASME	yes	yes	35	195	7	1
SMIC	no	no	20	164	3	3
CASME2	yes	yes	35	247	5	1
SAMM	yes	yes	32	159	7	13
$CAS(ME)^2$	no	yes	22	53 micro/250 macro	4	1

- 查了一些论文使用较多的是SMIC和CASME II
- 在CASME和CASME II中，所有参与者都是中国人，没有种族分布。SMIC有来自3个不同民族的参与者，而SAMM有13个不同民族参与者。
- SAMM在年龄分布上也有优势，平均年龄为33.24岁(SD:±11.32)。

- CASME II和SAMM具有较高的帧速率(200帧每秒)。SAMM是第一个高分辨率的数据集，设置为2040×1088像素，面部面积为400×400。
- CAS(ME)2的微表达样本数量有限，仅收集了53个。
- 在参与者的情绪刺激方面，CASME和SAMM分为7类，CASME II分为5类，SMIC只有3类。
- CASME、CASME II和SAMM都是使用FACS编码的。
- 虽然SAMM是由7个情绪类刺激的，但是在他们第一次发布的微动作的最终标签中只有FACS代码，而没有情绪类。

处理方法

非深度学习

预处理——特征提取——降维——分类

预处理

1. 灰度归一化
2. pose归一化
3. 尺寸归一化
4. 人脸识别

   去除背景和非人脸区域

type		# points	real-time	speed	performance	used in
Holistic	AAM [53]	68	✗	fair	poor generalization	[54], [55]
Part-based	MoT [56]	39/68	✗	slow/ fast	good	[57], [58]
	DRMF [59]	66	✗			[60], [61]
Cascaded regression	SDM [62]	49	✓	fast/ very fast	good/ very good	[16], [63]
	3000 fps [64]	68	✓			[55]
	Incremental [65]	49	✓			[66]
Deep learning	cascaded CNN [67]	5	✓	fast	good/ very good	[68]
	MTCNN [69]	5	✓			[70], [71]

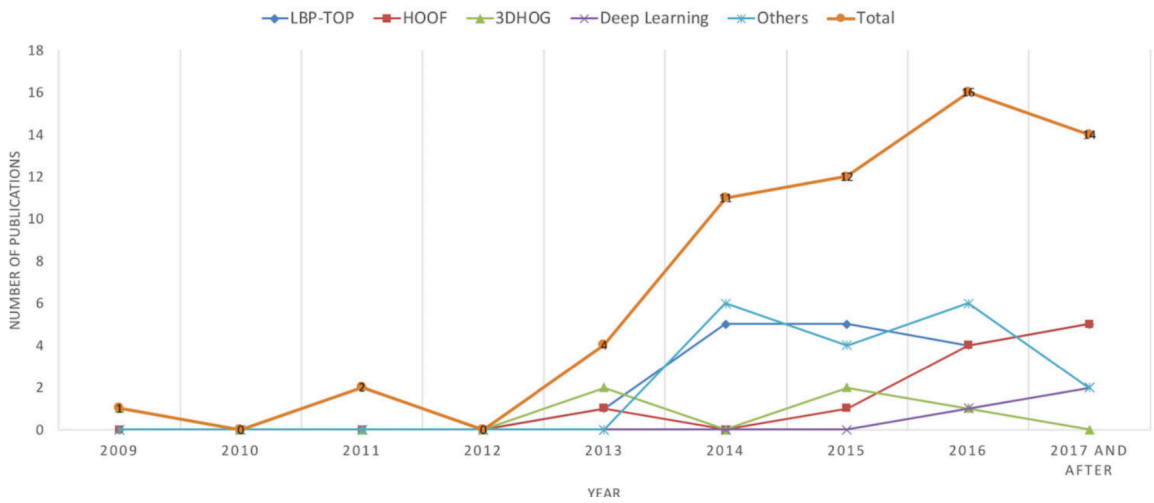
5. 数据扩充
   1. 实时数据扩充

      从图像的四个角和中心随机裁剪输入样本，然后水平翻转
   2. 离线数据扩充

      随机扰动和变换，如旋转、移位、倾斜、缩放、噪声、对比度和颜色抖动

特征提取

以前3DHOG比较流行，近年来HOOF和LBP-TOP较流行



降维

LLE、PCA、LDA

summary

情绪

feature + classifier	Performance	database
3d motion based feature + HMM(Hidden Markov Model)	81.93	BU-4DFE
HMM+SVM	75.62/93.89	oulu-casia/CK+
LBP+线性programming	93.8	jaffe
LBP+AdaBoost	84.6	CK+
PCA+SVM	87	mufe
手动+CNN	97.06	CK+、jaffe、MUG
HOG+SVM	95	CK+
LBP&HOG+softmax	98.3/90	CK+/jaffe
LBP+CNN（VGG16）		CK+、jaffe、oulu-casia
SHIFT+CNN		bu-3dfe、multi-PIE

微表情

模型	performance	dataset
CNN+LSTM	60.98	CASME II
DTSCNN	66.67	CASMEI+II
3DCNN		

Year	Authors	Datasets	Feature type	Classifier	Metrics (Best Result)
2016	Chen et al. [31]	CASME II(36 samples)	3DHOG	Fuzzy	Accuracy: 86.67%.
2016	Talukder et al. [57]	SMIC	LBP-TOP	SVM	Accuracy: 62% on SMIC-NIR
2016	Duan et al. [58]	CASME II	LBP-TOP from eye region	26 classifiers	Perform better on happy and disgust
2016	Huang et al. [62]	SMIC, CASME and CASME II	improved of STLBP-IP	SVM	Accuracy:64.33% on CASME 64.78% on CASME II and 63.41% on SMIC
2016	Wang et al. [63]	CASME II	LBP-TOP	SVM and KNN	Accuracy: 75.30%
2016	Zhang et al. [71]	CASME II	gabor filter+ PCA and LDA	SVM	Good performance on static image
2016	Huang et al. [72]	SMIC, CASME and CASME II	STCLQP	Codebook	Accuracy:64.02% on SMIC 57.31% CASME and 58.39% CASME II
2016	Ben et al. [73]	CASME	MMPTR	Euclidean distance	Accuracy: 80.2%
2016	Liong et al. [74]	SMIC and CASME II	Bi-WOOF	SVM	F1-score:0.61 on CASME II, 0.62 on SMIC-HS
2016	Liong et al. [75]	SMIC and CASME II	Bi-WOOF	SVM	F1-score:0.59 on CASME II Accuracy:53.52 on SMIC-VIS
2016	Liong et al. [76]	CASME II and SMIC	Optical Strain	SVM	Accuracy:63.41% on CSME II 52.44% on SMIC
2016	Oh et al. [77]	CASME II and SMIC	I2D	SVM	F1-score: 0.41 and 0.44 on CASME II and SMIC
2016	Wang et al. [78]	CASME and CASME II	STCCA	Nearest Neighbor, SVM	Mean recognition accuracy : 41.20% on CASME 38.39 on CASME II
2016	Zheng et al. [79]	CASME and CASME II	LBP-TOP, HOOF	RK-SVD	Accuracy:69.04% on CASME 63.25% on CASME II
2016	Kim et al. [80]	CASME II	CNN	LSTM	Accuracy: 60.98%
2017	Zhang et al. [66]	CASME II	LBP-TOP,Optical Flow	KNN, SVM and RF	Accuracy: 62.50%
2017	Zheng [81]	SMIC, CASME and CASME II	2DGSR	SRC	Accuracy:71.19% and 64.88% on CASME and CASME II
2017	Ben et al. [82]	CASME II	HWP-TOP	SSVM	Recognition rate of 0.868
2017	Zong et al. [67]	CASME II and SMIC	LBP-TOP	TSRG	UAR 60.15
2017	Happy and Routray [83]	CASME II, CASME and SMIC	FHOFO	SVM, KNN and LDA	F1-score was 0.5489, 0.5248 and 0.5243 CASME, CASME II and SMIC
2017	Hao et al. [84]	JAFFE	WLD and DBN	DBN	Recognition rate: 92.66
2017	Peng et al. [85]	CASMEI/II	OF	DTSCNN	Accuracy up to 66.67%
2018	Liong et al. [69]	CASME II and SMIC	OSF and LBP-TOP	SVM	F-measure: 0.51 and 0.31 SMIC and CASME II
2018	Zhu et al. [86]	CASME II	LBP-TOP and OF	SVM	accuracy of 53.3%
2018	Zong et al. [70]	CASME II and SMIC	LBP-TOP, LBP-SIP and STLBP-IP	KGSL	F1: 0.6125 on CASME II