

"Deep facial expression recognition: A survey." Li, Shan, and Weihong Deng.

Deep facial expression recognition: A survey.

摘要

- 1. 数据集
- 2. 标准的训练和预测流程
- 3. 最新的网络结构和训练方法的总结
- 4. 更多的问题和实际场景
- 5. 挑战和机遇

知识点

数据集

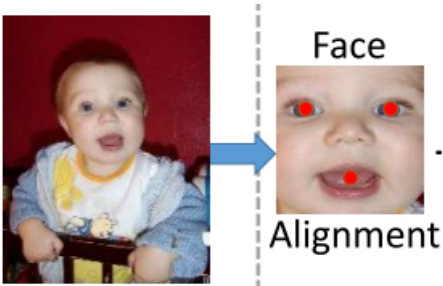
下面是从论文里面选出来的静态图像数据集

数据集	样本数量	情景	标签	链接
MMI	740	实验室	6基本表情+中性	https://mmifacedb.eu/
JAFPE	213	实验室	6+N	http://www.kasrl.org/jaffe.html
TFD	112,234	实验室	6+N	
FER-2013	35,887	野外	6+N	https://www.kaggle.com/c/challenges-in-representation-learning-facial-expression-recognition-challenge
SFEW 2.0	1,766	电影	6+N	https://cs.anu.edu.au/few/emotiw2015.html
Multi-PIE	755,370	实验室	笑, 惊讶, 眯眼, 恶心, 尖叫和中性	
BU-3DFE	2,500	实验室	6+N	http://www.cs.binghamton.edu/~lijun/Research/3DFE/3DFE_Analysis.html
RaFD	1,608	实验室	6+N+轻视	http://www.socsci.ru.nl:8180/RaFD2/RaFD
KDEF	4,900	实验室	6+N	http://www.emotionlab.se/kdef/
EmotioNet	1,000,000	野外	23个基本表情和复合表情	http://cbcs1.ece.ohio-state.edu/dbform_emotionet.html
RAF-DB	29,672	野外	6+N, 12种复合表情	http://www.whdeng.cn/RAF/model1.html
AffectNet	450,000	野外	6+N	http://mohammadmahoor.com/affectnet/

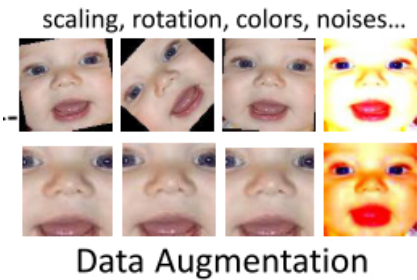
识别流程

预处理

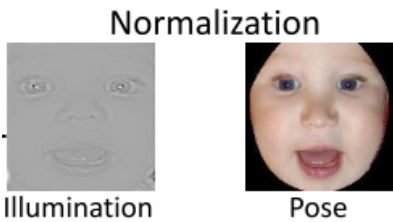
人脸对齐：检测图片中的人脸并变形对齐到同一个尺寸的图片中



数据增强：进行缩放，旋转，加入噪声等试图扩展数据集



归一化：光照归一化，姿势归一化等



特征学习网络

- Convolutional neural network (CNN)
- Deep beliefnetwork (DBN)
- Deep autoencoder (DAE)
- Recurrent neural network (RNN)
- Generative Adversarial Network (GAN)

Network type	data	variations*	identity bias	efficiency	accuracy	difficulty
Pre-train & Fine-tune	low	fair	vulnerable	high	fair	easy
Diverse input	low	good	vulnerable	low	fair	easy
Auxiliary layers	varies	good	varies	varies	good	varies
Network ensemble	low	good	fair	low	good	medium
Multitask network	high	varies	good	fair	varies	hard
Cascaded network	fair	good	fair	fair	fair	medium
GAN	fair	good	good	fair	good	hard

分类

- Pre-train & Fine-tune
- Diverse input

- Auxiliary layers
- Network ensemble
- Multitask network
- Cascaded network
- GAN

The State of The Art