Klix Project

Klix project

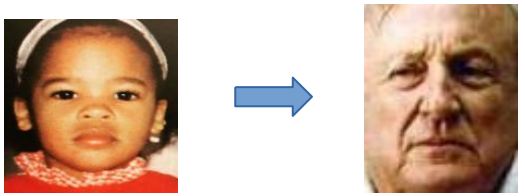
- 1- Dataset
- 2- Identification
- 3-Verification
- 4-Server

Dataset

Dataset	Identity number	All images	Child Images
LFW	5749	13233	A few
AgeDB	568	16488	A few
LCW(our datset)	1921	28,943	14905

Prepare the LCW

- Focuses on **Young** faces



- Similar to **LFW** structure

Prepare the LCW

- Four different age groups:
- 1- Young

- 2-Teenager

- 3-Minor

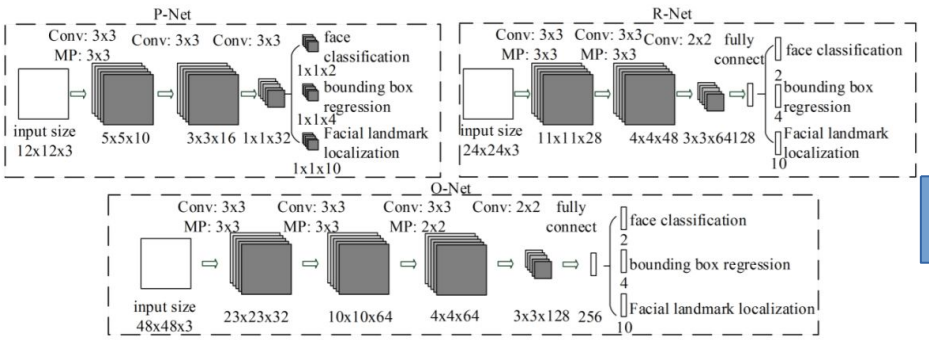
- 4-Adult

Prepare the dataset

- Mix of 3 dataset :
- IMDB-Wiki +AgeDB+ FGNet
- Added some more images from the internet

Prepare the dataset

- Cutting the face with MTCNN



Prepare the Dataset

- Cleaning:
- 1- Delete the images which are not related to that identities

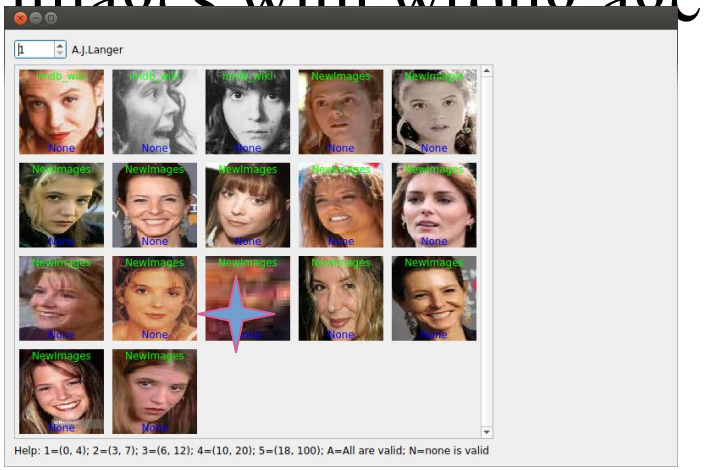

imdb_wiki-29222.jpg


imdb_wiki-39540.jpg


imdb_wiki-39541.jpg


imdb_wiki-39544.jpg

- 2-Remove the images with wrong age label



Identification Dataset

- Baby(0-3),Toddler (3-6), Child (7-12), Teen (13-20) , Adult (20 and older)
- The four datasets are:
- 1) LCW-Young,Children+Toddlers+Babies

LCW Dataset


AbigailMavity1.jpeg
4.6 kB


AbigailMavity2.jpeg
5.0 kB


AbigailMavity3.jpeg
5.0 kB


AbigailMavity4.jpeg
4.6 kB


AbigailMavity5.jpeg
5.8 kB


AdamIrigoyen1.jpeg
6.4 kB


AdamIrigoyen2.jpeg
5.8 kB


AdamIrigoyen3.jpeg
6.0 kB


AdamIrigoyen4.jpeg
8.1 kB


AdamIrigoyen15.jpeg
8.0 kB


AdamLambert1.jpeg
5.9 kB


AdamLambert2.jpeg
7.1 kB


AdamLambert3.jpeg
6.3 kB


AdamLambert4.jpeg
5.1 kB


AlyssaMilano1.jpeg
5.7 kB


AlyssaMilano2.jpeg
6.7 kB


AlyssaMilano3.jpeg
5.7 kB

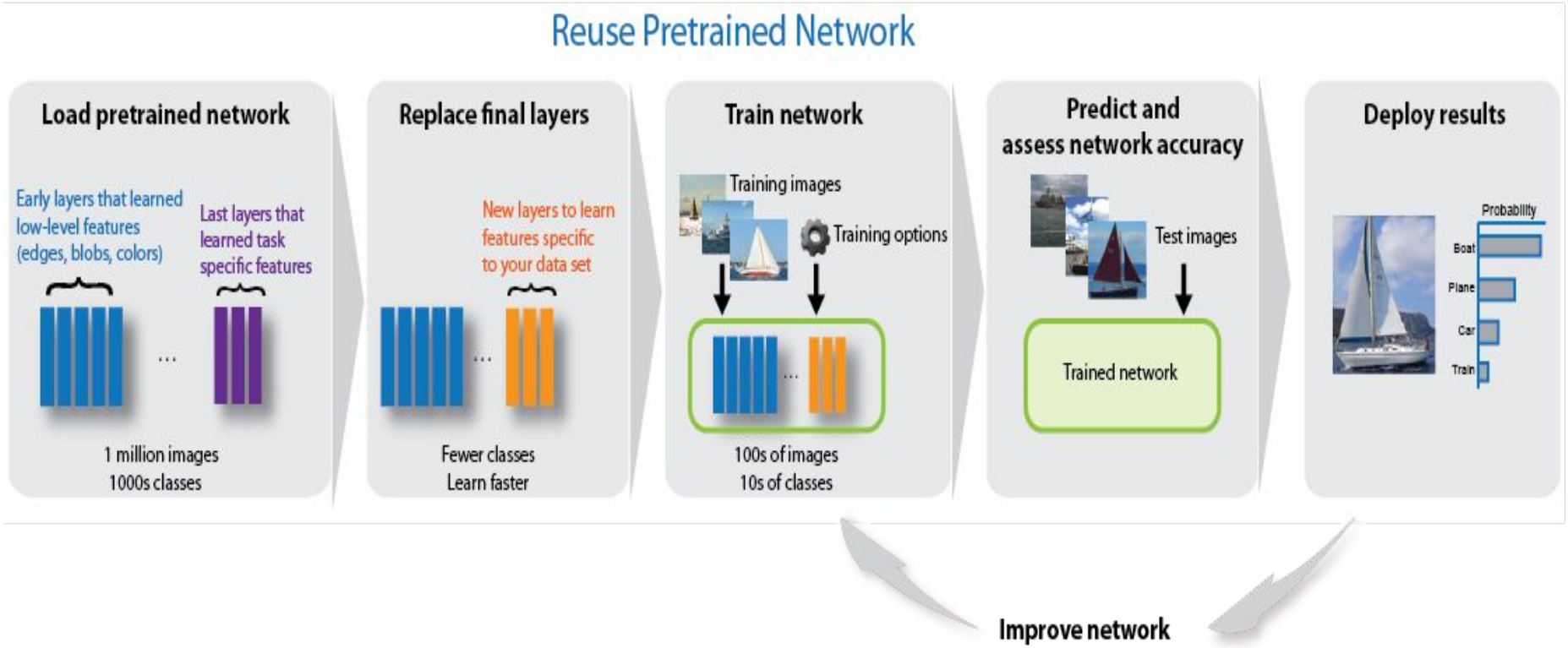

AlyssaMilano4.jpeg
6.3 kB


AlyssaMilano5.jpeg
5.5 kB


imdb_wiki-37105.jpg
5.8 kB

Identification

- Transfer learning



VGGFace

- from keras_vggface.vggface import VGGFace
- vggface = VGGFace(model='vgg16')
- vggface = VGGFace(model='resnet50')
- vggface = VGGFace(model='senet50')
- VGGFace consists of 2.6M images of 2,622 identities

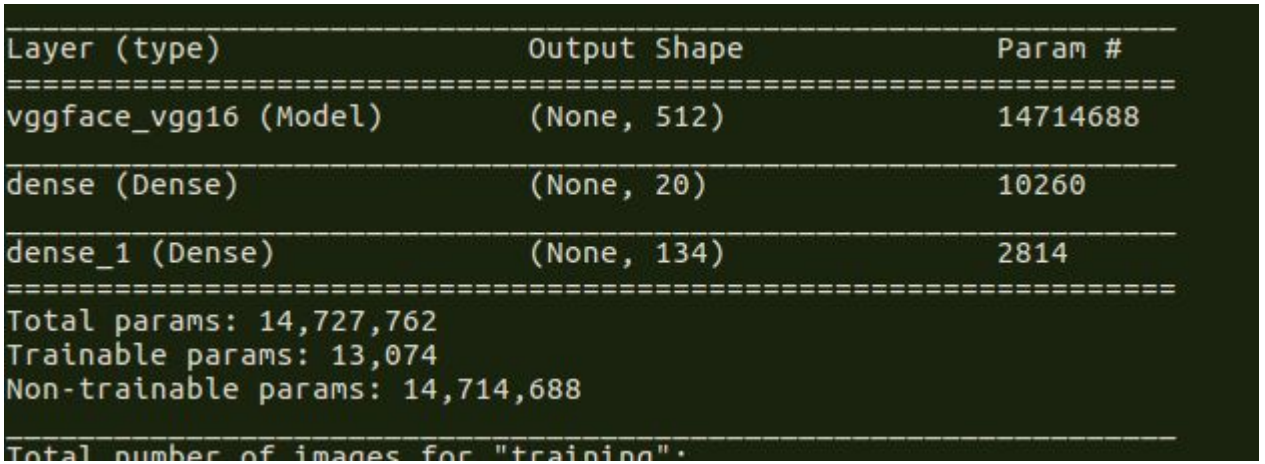
Identification Results

optimizer	Epoch	Batch-size	pooling	model	Acc	Neuron number	Lr
Adam	250	15	avg	VGG*	83	200,134	10^{-5}

VGG*:VGGFace model + 2 Dense layers

Different models

- VGGface + 2 Dense layers(model1)



```
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
vggface_vgg16 (Model)        (None, 512)               14714688
_________________________________________________________________
dense (Dense)                (None, 20)                10260
_________________________________________________________________
dense_1 (Dense)              (None, 134)               2814
=================================================================
Total params: 14,727,762
Trainable params: 13,074
Non-trainable params: 14,714,688
_________________________________________________________________
Total number of images for "training":
```

Different models

- VGGface + 3 Dense layers(model2)

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
vggface_vgg16 (Model)        (None, 512)               14714688
_________________________________________________________________
dense (Dense)                (None, 100)               51300
_________________________________________________________________
dense_1 (Dense)              (None, 50)                5050
_________________________________________________________________
dense_2 (Dense)              (None, 134)               6834
=================================================================
Total params: 14,777,872
Trainable params: 63,184
Non-trainable params: 14,714,688
_________________________________________________________________
Total number of images for "training":
Found 3418 images belonging to 134 classes.
Total number of images for "testing":
Found 550 images belonging to 134 classes.
Found 375 images belonging to 134 classes.
WARNING:tensorflow:`period` argument is deprecated. Please use `save_freq` to specif
WARNING:tensorflow:From vgg16changed4.py:164: Model.fit_generator (from tensorflow.p
```

Different models

- VGGface + dropout+ flatten+ dense+ dropout(20)+ dense(100) + dense(134)(model3)

Layer (type)	Output Shape	Param #
vggface_vgg16 (Model)	(None, 512)	14714688
dropout (Dropout)	(None, 512)	0
flatten (Flatten)	(None, 512)	0
dense (Dense)	(None, 20)	10260
dropout_1 (Dropout)	(None, 20)	0
dense_1 (Dense)	(None, 100)	2100
dense_2 (Dense)	(None, 134)	13534

Total params: 14,740,582
Trainable params: 25,894
Non-trainable params: 14,714,688

Total number of images for "training":

Comparison the models

optimizer	Epoch	Batch-size	pooling	model	Acc	Neuron number	Lr
Adam	250	15	avg	3	15	20,100,134	10^{-5}
Adam	250	15	avg	2	47	20,100,134	10^{-5}
Adam	250	15	avg	1	**83**	200,134	10^{-5}

Comparison

Dataset	Number of subjects	Number of images per subject	All images	Number of child images	Method	ACC	Precision	Recall
LCW-Teen	134	Unbalance >9 images	4333	4333	VGG*(our method)	83	87	81
LFW(subset)	161	Unbalance >9 images	4333	4333		92	91	89
LFW(subset)	30	20	600	0	TLSRWF[1]	76	-	-
					TLSR[2]	72	-	-
					CRC[3]	68	-	-
					PCA+BP[4]	45	-	-
					FAStPCA[5]	48	-	-
					LBP[6]	42	-	-

[5] **FastPCA :** fast principal component analysis method,
[6] **LBP:** local binary patterns method

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Thanks

Question?