ChaLearn Looking at People Workshop

Apparent Age Estimation Hackathon

Pablo Pardo, UB, Xavier Baró, UOC, Junior Fabian, CVC, Hugo Escalante, INAOE, Sergio Escalera, CVC/UB, Jordi González, CVC, Marc Oliu, UB, Isabelle Guyon, Chalearn
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Codalab

Why Codalab

- Open source platform
  - Live development
  - Flexible to any kind of competition/event
- GPU capabilities in near future
Codalab

Popular Competitions

1. ChaLearn Automatic Machine Learning Challenge (AutoML)
   - Dec 08, 2014
   - 557 participants
   - USD $30,000 reward
   - Organized by

2. ChaLearn Looking at People 2014 - Track 3: Gesture Recognition
   - Feb 09, 2014
   - 193 participants
   - Organized by

3. ChaLearn Looking at People 2015 - Track 1: Age Estimation
   - Jun 15, 2015
   - 135 participants
   - USD $6,000 reward
   - Organized by

Featured Competitions

1. MICCAI Multimodal Brain Tumor Segmentation (BRaTS) Challenge
   - Aug 30, 2013
   - 80 participants

2. AutoML :: ROUND 3 PRACTICE
   - Dec 07, 2015
   - 2 participants
   - Organized by automl.chalearn

3. CSI 2014 Vertebra Localization and Identification - Training Part
   - Mar 01, 2014
   - 22 participants
ChaLearn Looking at People 2015 - Track 1: Age Estimation

Organized by xbaro - Current server time: Dec. 12, 2015, 8:15 p.m. UTC

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<th>First phase</th>
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<td>Development</td>
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Learn the Details | Phases | Participate | Results | Forums

Overview
- Evaluation
- Terms and Conditions

ChaLearn Looking at People Challenge and Workshop 2015
Winners: Rasmus Rothe, Radu Timofte and Luc van. Gool


Next challenge starts on January 2016 and the results will be presented in the CVPR 2016.
1. Input Image
2. Face Detection
3. Cropped face
4. Feature Extraction
5. Prediction

Mathias et al. detector
+ 40% margin

VGG-16 architecture
Softmax expected value

Σ = 38.4 years
DEX Pipeline - II

1 - Face Detection

Uses the vanilla Deformable Part Models face detector from [1] with angles from -60° to 60° in 5° steps and due to some upside down images in the dataset also run the detector for -90°, 90° and 180°. Crop the face to 256x256 pixels.

2 - Feature Extraction

Use the deep learning CNN network VGG-16

• Pretrain with ImageNet.
• Fine-tune with IMDB and WIKI real age dataset.
• Fine-tune with Chalearn training apparent age dataset.
3 - Prediction

The output layer has 101 standard softmax units. The last step is to compute the softmax expected value, i.e.

\[ E(O) = \sum_{i=0}^{100} y_i o_i \]

where \( y_i \) are the discrete years of each class and \( o_i \) are the output probabilities.
The code was implemented on Matlab. We added couple of python scripts to generate some caffe training files.

The training and testing part use the caffe framework.

“Caffe is a deep learning framework made with expression, speed, and modularity in mind. It is developed by the Berkeley Vision and Learning Center (BVLC) and by community contributors.”[2]

The detection and cropping of faces can be speeded up by using a cluster. The train and test can be done using CPU or GPU by just changing some flags in the code.

In the following demo we will use CPU and a tiny dataset of 15 images. The same code can be used to train and test with any other dataset by small changes of paths in the code.
You can download the code from the workshop website [http://gesture.chalearn.org/hackaton-iccv](http://gesture.chalearn.org/hackaton-iccv)

There are three important steps in the code, all of them detailed in the README.txt file:

1. Image Preprocessing
2. Train
3. Test
● Change the variable WORKING_DIR to your working path from the following files:
  ○ data/load_and_process_img.m
  ○ data/prepareDataForCaffe.m
  ○ data/predict_age.m
  ○ data/prepareCaffeScripts.py

● Change the Caffe local path from the files:
  ○ data/init.m
  ○ data/predict_age.m
Image Preprocessing

The file script `load_and_preprocess_img.m` will detect the faces and landmarks from the images.

You can specify the data folder and some parameters such as the number of augmentations done per each image.

```
$ matlab -nojvm -nodisplay -nodesktop -r load_and_preprocess_img
```

Approximate time ~ 15 min
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1. 
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10.
Age Estimation Hackathon
Training

In order to train we need to specify the path to the data folder and run the scripts:

- `prepareDataForCaffe.m`
- `prepareCaffeScripts.py`

Run the following bash script to train:

```
$ matlab -nojvm -nodisplay -nodesktop -r prepareDataForCaffe
$ python2 prepareCaffeScripts.py
$ cd ../models/training_scripts/
$ sh run_experiment.sh
```

Approximate Time ~ 10 min
Testing

In order to test the trained model we need to run `inint.m` and `predict_age.m`.

You may have to export the `CAFFE_ROOT` and `LD_LIBRARY_PATH` to your `caffe` dir and `cuda/lib64` dir.

```
$ export CAFFE_ROOT=/path/to/caffe
$ export LD_LIBRARY_PATH=/path/to/cuda/lib64:$LD_LIBRARY_PATH
$ matlab -nojvm -nodisplay -nodesktop -r 'init(0); predict_age'
```

Approximate time ~3 min
Results

The last code wrote a prediction file in the results/ folder. To get the final score you need to execute the python script evaluation.py changing first the name of your prediction file.

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Ground Truth: 43
Prediction: 51

Ground Truth: 21
Prediction: 43
That was all
Thanks