DeepFace

Outline

Abinash Pun

Nov 28, 2022

Face Recognition Pipeline

1. Face Detection:
   - Detect the presence of human face(s)
2. Alignment
3. Normalization

Optional

4. Representation (encoding=>embedded in feature space)
   - Represent image as vectors
5. Face Recognition
   - “Whose face is that?”=>Classification in feature space (?)
   - “face verification” with available images in database

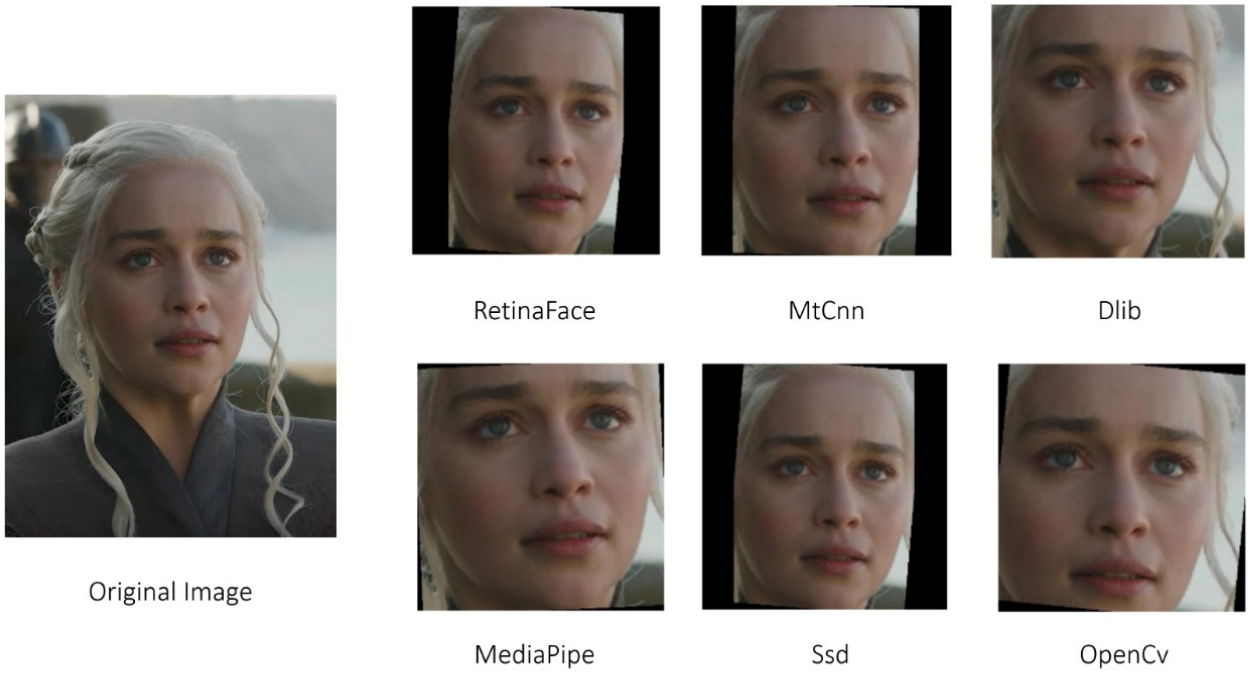
Additional work before pipeline: Finding out if it is a real person, photo or video

DeepFace

1. Face Detection: provides wrapper for
   - ***opencv, ssd, dlib, mtcnn, retinaface, mediapipe***
2. Alignment: done together with first step (same process for all detection models)
3. Normalization: Different for different detection models
4. Representation (Embedding)
   - Main prediction output from the Face recognition models; **'VGG-Face', *'Facenet', 'Facenet512', 'OpenFace', 'DeepFace', 'DeepID', 'ArcFace', 'Dlib', 'SFace'***
   - Pretrained and weights are provided. Downloaded from the link for the first time you build the model
5. Finding the corresponding face in db
   - Verifying the source face with each face available in db
   - Distance matric used: ***cosine, euclidean, euclidean_l2***

DeepFace

Detection



- RetinaFace and MTCNN seem to overperform in detection and alignment stages, but they are much slower
- Opencv and ssd outperform other in speed

Recognition

Model	LFW Score	YTF Score
Facenet512	99.65%	-
SFace	99.60%	-
ArcFace	99.41%	-
Dlib	99.38 %	-
Facenet	99.20%	-
VGG-Face	98.78%	97.40%
Human-beings	*97.53%*	-
OpenFace	93.80%	-
DeepID	-	97.05%

Downloading... From:
https://github.com/serengil/deepface_models/releases/download/v1.0/facenet512_weights.h5
To: /Users/abinashpun/.deepface/weights/facenet512_weights.h5