

HW#1: Face Recognition Cost Functions

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Code

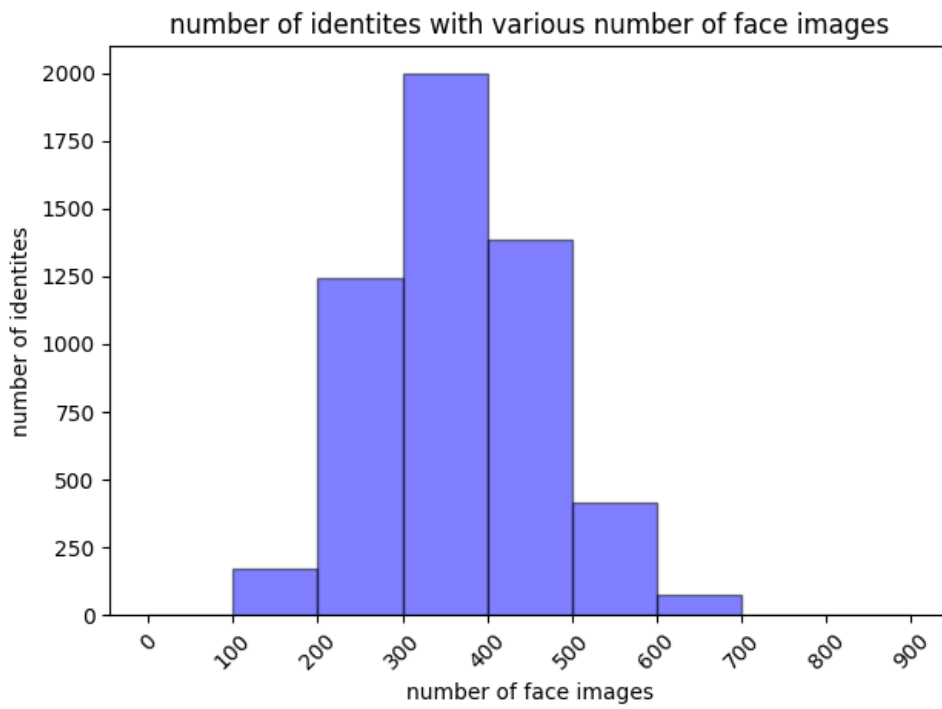
- <https://github.com/shiannn/AMMAI-HW1>

1 BackBones

- The implementation is using ResNet34 in Pytorch
 - without pre-train
- Augmentation Transform (Training)
 - Resize to (160, 160)
 - RandomHorizontalFlip
 - Normalize to mean=[0.5, 0.5, 0.5], std=[0.5, 0.5, 0.5]
- Augmentation Transform (Testing)
 - RandomHorizontalFlip
 - Normalize to mean=[0.5, 0.5, 0.5], std=[0.5, 0.5, 0.5]
- Optimizer and Learning Rate
 - Adam with lr=0.001
- Batch size
 - 64
- Embedding Dimension
 - 128

2 Datasets

- Using **subset** of VGGFace2 (Due to storage resource)
 - 5296 identities
 - 1932391 faces
 - without alignment

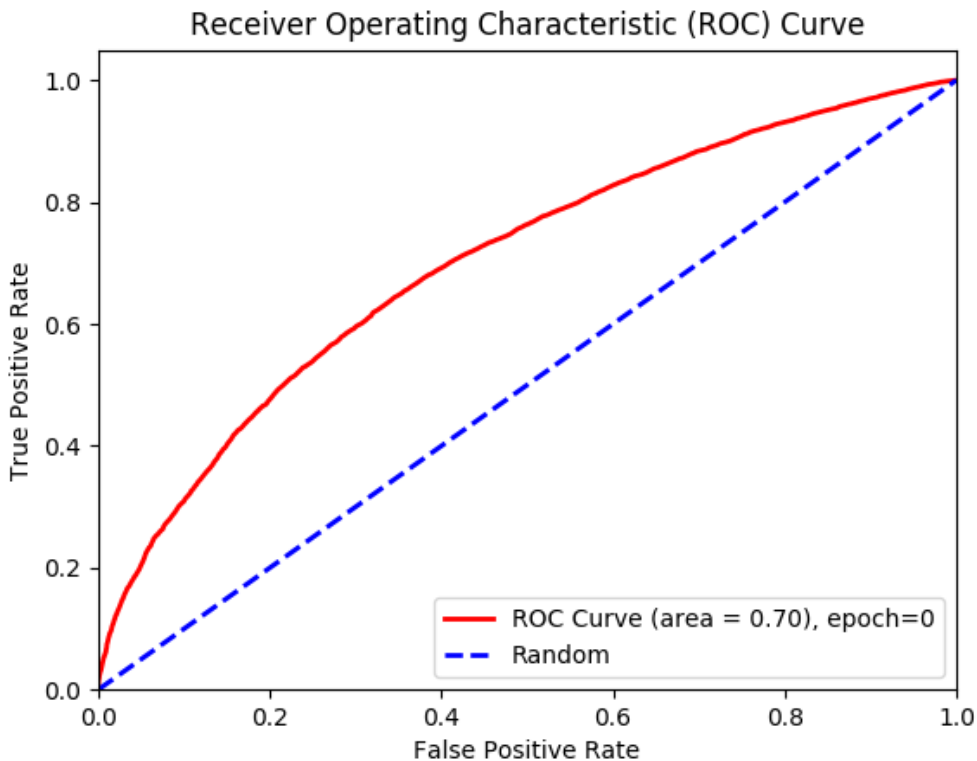


3 Performance of varying cost functions

Directly use "C" (face detection + alignment) for the evaluations

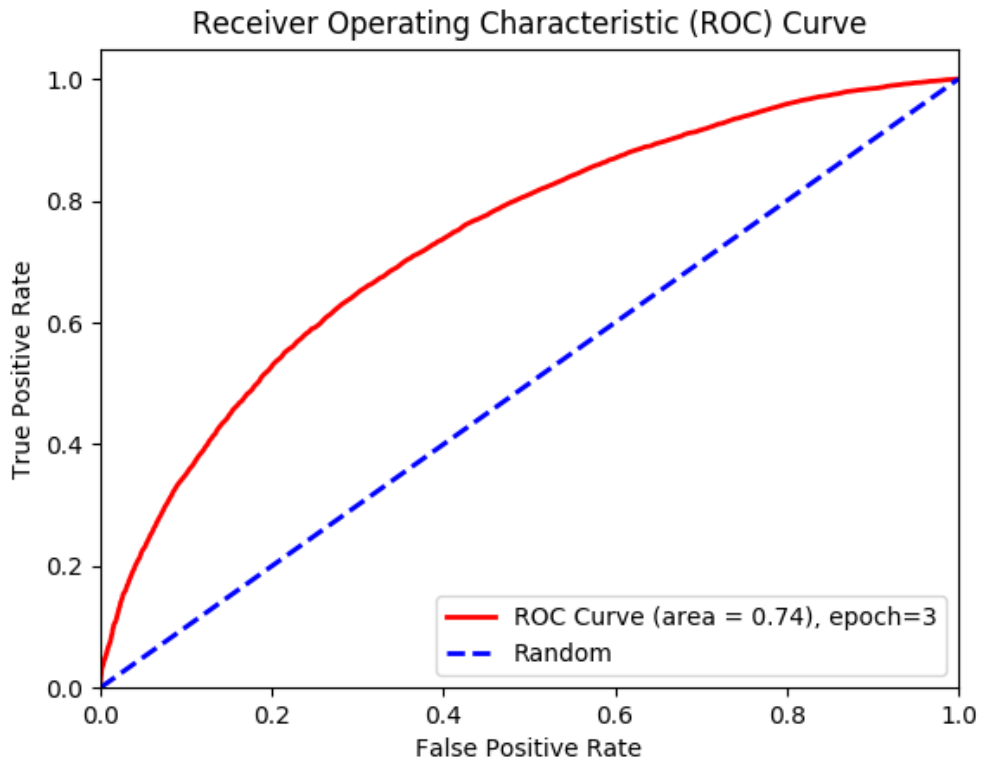
3.1 Softmax only

- Training model on the 5296 classes on the subset of VGGFace2
 - using crossEntropy loss function (softmax + nllLoss)



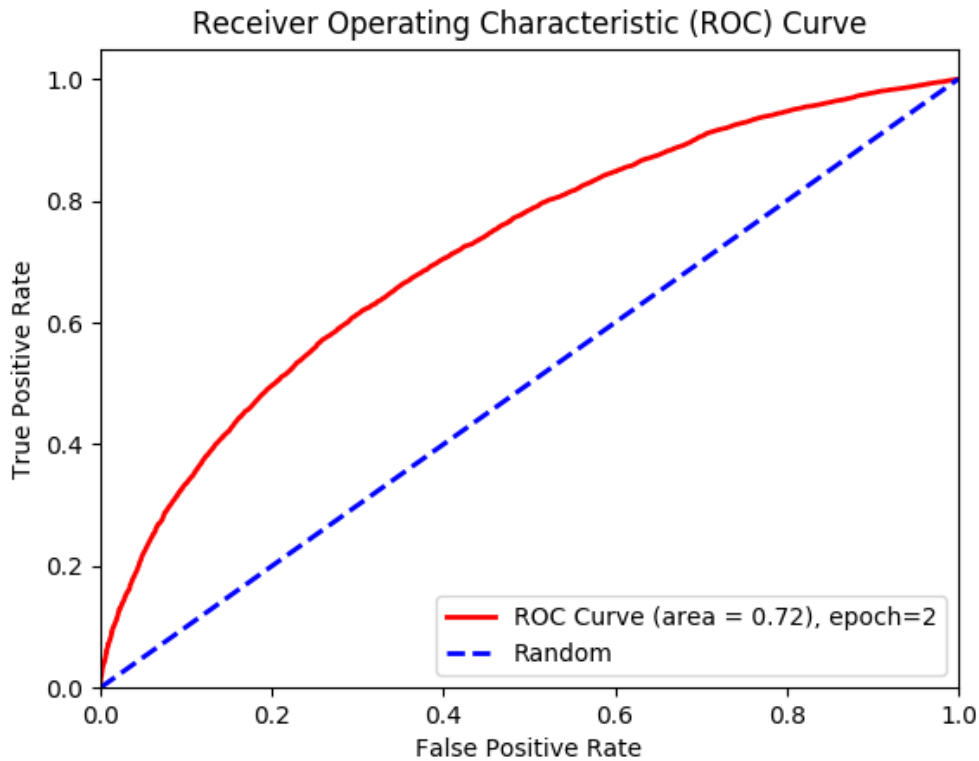
3.2 Center loss

- Training model on the 5296 classes on the subset of VGGFace2
 - using center loss



3.3 ArcFace

- Training model on the 5296 classes on the subset of VGGFace2
 - using ArcMargin Loss



4 Citations

- pytorch resnet34
 - Model <https://github.com/pytorch/vision/blob/master/torchvision/models/resnet.py>
- vggface2
 - Q. Cao, L. Shen, W. Xie, O. M. Parkhi, A. Zisserman "VGGFace2: A dataset for recognising faces across pose and age"
 - Papers <https://arxiv.org/abs/1710.08092>
 - Datasets http://www.robots.ox.ac.uk/~vgg/data/vgg_face2/
- ArcFace
 - Deng, Jiankang, et al. "Arcface: Additive angular margin loss for deep face recognition." Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition. 2019.
 - Papers <https://arxiv.org/pdf/1801.07698.pdf>
 - Implementation <https://github.com/foamliu/InsightFace/blob/master/models.py>
- Center Loss
 - Wen, Yandong, et al. "A discriminative feature learning approach for deep face recognition." European conference on computer vision. Springer, Cham, 2016.
 - Papers <https://ydwen.github.io/papers/WenECCV16.pdf>
 - Implementation https://github.com/tamertamoqa/facenet-pytorch-vggface2/blob/master/train_center.py