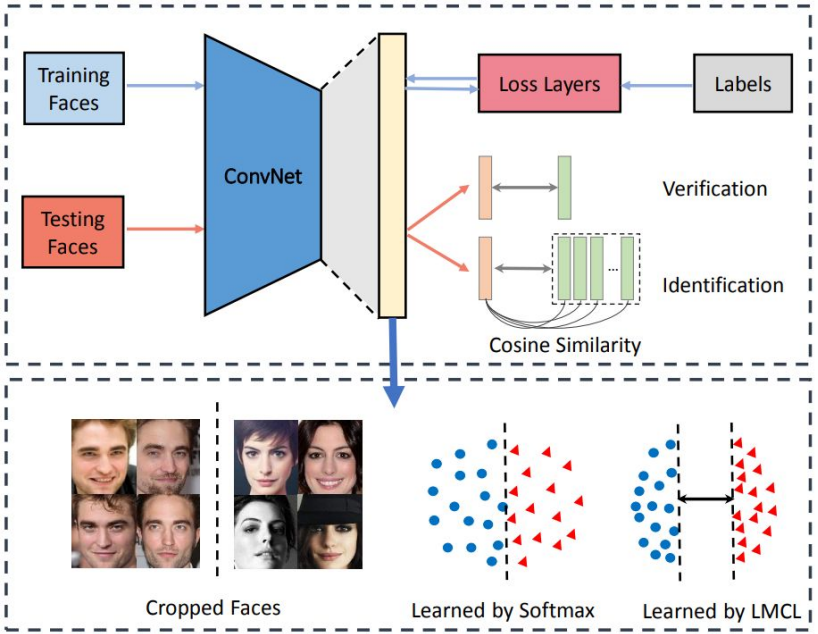
Group: chachacha

Anil Osman TUR, Bin REN, Vittorio PIPPI, Matteo BORTOLON

The architecture

CosFace is a novel architecture proposed by Wang et al. 2018 that introduce a novel loss function, namely large margin cosine loss (**LMCL**).



$$L_{lmc} = \frac{1}{N}\sum_{i} -\log \frac{e^{s(\cos(\theta_{y_i,i})-m)}}{e^{s(\cos(\theta_{y_i,i})-m)} + \sum_{j\neq y_i} e^{s\cos(\theta_{j,i})}}$$

Hao Wang, Yitong Wang, Zheng Zhou, Xing Ji, Zhifeng Li, Dihong Gong, Jingchao Zhou, and Wei Liu. Cosface: Large margin cosine loss for deep face recognition. In CVPR, 2018.

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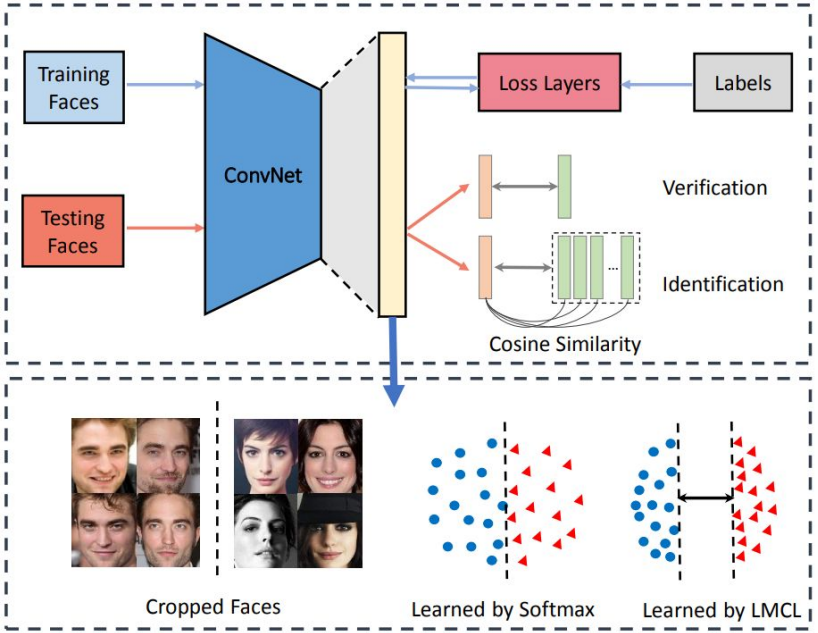

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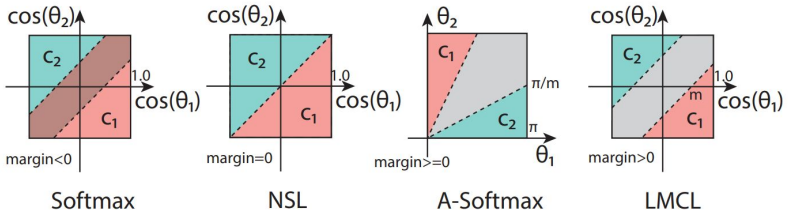
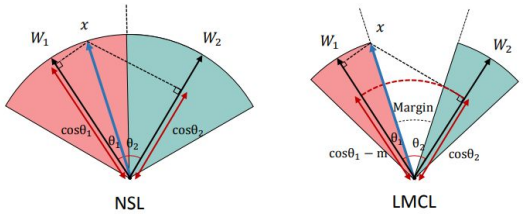
Different losses comparison



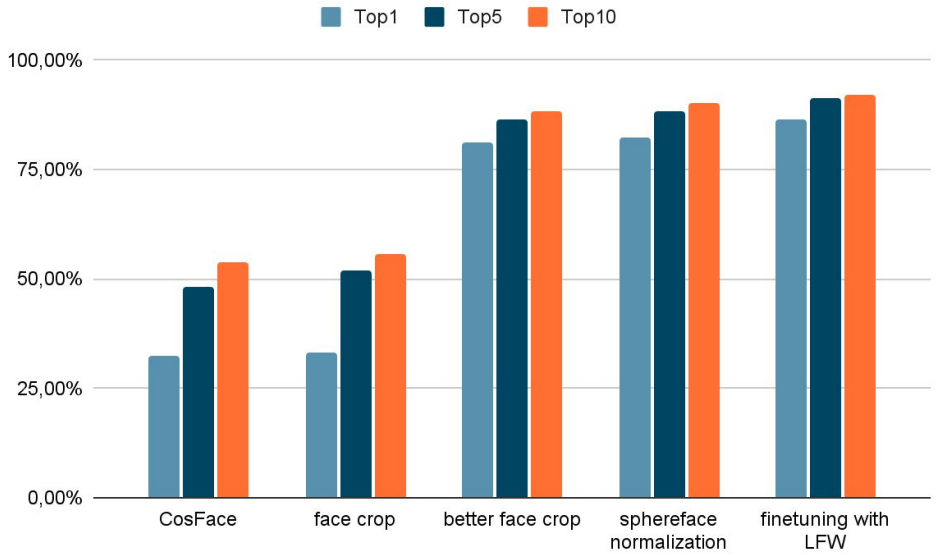
The comparison of **decision margins for different loss functions** the binary-classes scenarios. Dashed line represents decision boundary, and gray areas are decision margins.



A geometrical interpretation of LMCL from feature perspective. **Different color areas represent feature space from distinct classes.** LMCL has a relatively compact feature region compared with NSL.

The network used

We used the model with the **ResNet50** baseline and pretrained model on **glint360k**



After finetuning on LFW

Settings:

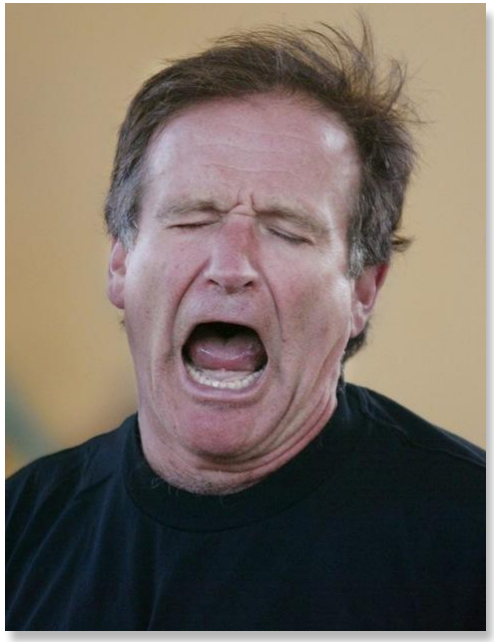
Epochs	**3**
Learning rate	**1e-05**
Batch size	**32**
Image size	**112**

Top scores:

Top1	**86,27%**
Top5	**91,18%**
Top10	**92,16%**

The pipeline

- Input image



The pipeline

- Input image
- crop with **RetinaFace**

Deng, Jiankang, et al. "Retinaface: Single-shot multi-level face localisation in the wild." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2020.

The pipeline

- Input image
- crop with **RetinaFace**
- finetuned **CosFace** feature extraction

Image Feature

Hao Wang, Yitong Wang, Zheng Zhou, Xing Ji, Zhifeng Li, Dihong Gong, Jingchao Zhou, and Wei Liu. Cosface: Large margin cosine loss for deep face recognition. In CVPR, 2018.

The pipeline

- Input image
- crop with **RetinaFace**
- finetuned **CosFace** feature extraction
- retrieval

Hao Wang, Yitong Wang, Zheng Zhou, Xing Ji, Zhifeng Li, Dihong Gong, Jingchao Zhou, and Wei Liu. Cosface: Large margin cosine loss for deep face recognition. In CVPR, 2018.

End chachacha