Introduction to face verification

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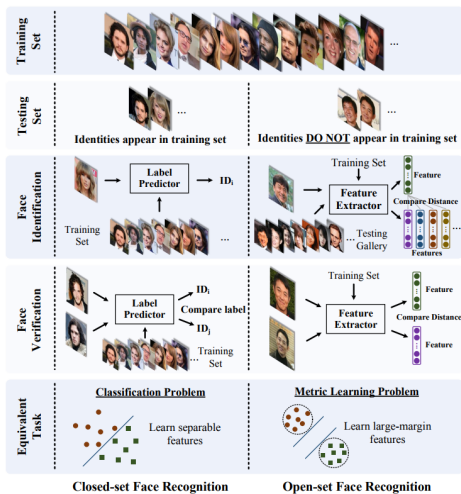Department of Statistics, Seoul National University, South Korea

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Figure 1: Comparison of open-set and closed-set face recognition.

Face Verification

- The embedding is represented by $f(x) \in \mathbb{R}^d$.
- We constrain this embedding to live on the d-dimensional hypersphere : $\|f(x)\|_2 = 1$.
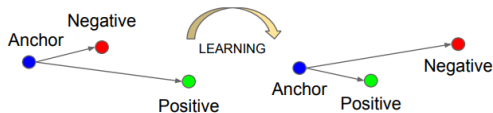- Model structure

- DeepID2(Sun et al., 2014)
  - $\frac{1}{2}\|f(x_i) - f(x_j)\|_2^2$ if $y_{ij} = 1$.
  - $\frac{1}{2}\max(0, m - \|f(x_i) - f(x_j)\|_2)^2$ if $y_{ij} = -1$.

Face Verification

- Triplet loss, FaceNet(Schroff et al., 2015)
  - $\left[\|f(x_i^a) - f(x_i^p)\|_2^2 - \|f(x_i^a) - f(x_i^n)\|_2^2 + \alpha \right]_+$

- Performance improvement for face verification
  - Illumination invariance
  - Occlusion invariance

Some Topics in Face Verification

- Clustering based semi-supervised learning
- Visual Attention and Meta Learning
- Adaptive Learning
- W-GAN
- Uneven data distribution
- Angular Softmax Loss