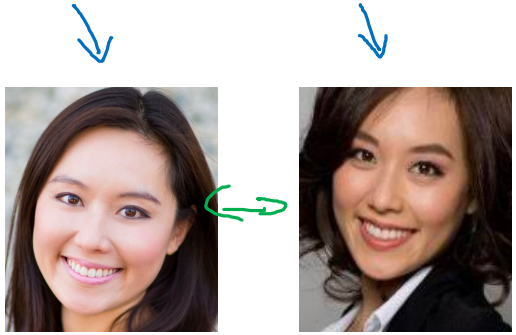
deeplearning.ai

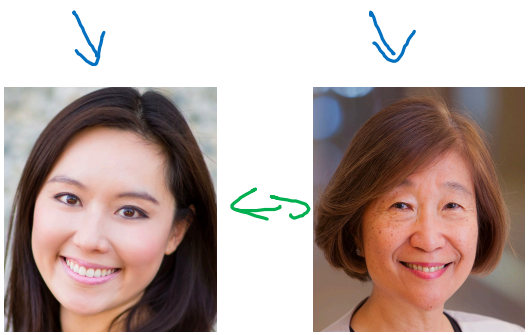
Face recognition

Triplet loss

Learning Objective



Anchor (A) Positive (P)



Anchor (A) Negative (N)

$d(A,P) \leq 0.5$ $\quad d(A,N) = 0.5 \;\; 0.7$

Want: $\underbrace{\|f(A) - f(P)\|^2}_{d(A,P)} + \alpha \leq \underbrace{\|f(A) - f(N)\|^2}_{d(A,N)}$ $\quad \alpha: 0.2$

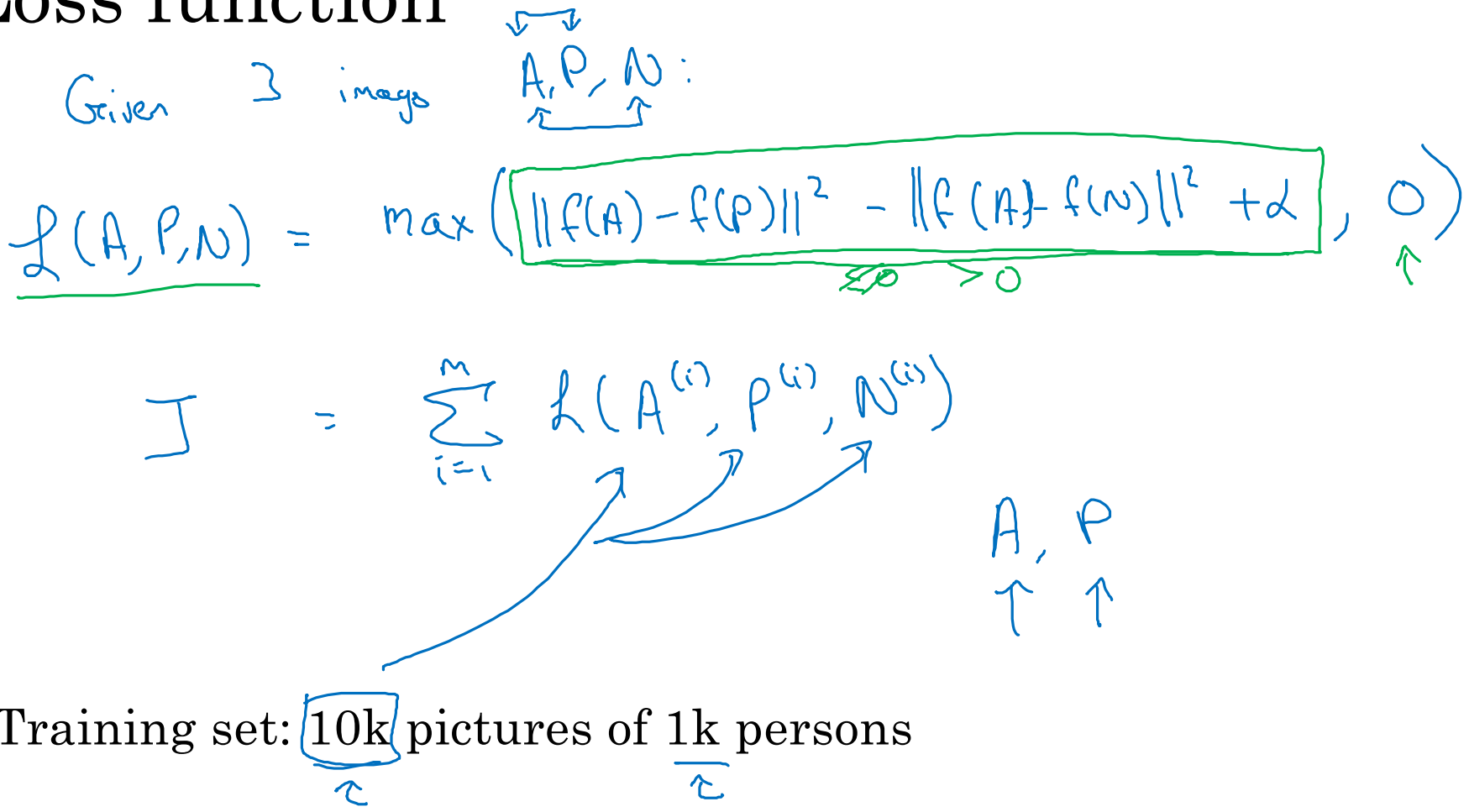
$$\|f(A) - f(P)\|^2 - \|f(A) - f(N)\|^2 + \alpha \leq 0$$

0 $\quad$ 0 $\quad$ margin

$\#/\#\#$ $\quad f(\text{img}) = \vec{0}$

[Schroff et al.,2015, FaceNet: A unified embedding for face recognition and clustering]

Loss function



[Schroff et al.,2015, FaceNet: A unified embedding for face recognition and clustering]

Choosing the triplets A,P,N

During training, if A,P,N are chosen randomly, $d(A,P) + \alpha \leq d(A,N)$ is easily satisfied.

$\|f(A) - f(P)\|^2 + \alpha \leq \|f(A) - f(N)\|^2$

Choose triplets that're "hard" to train on.

$d(A,P) + \alpha \leq d(A,N)$

$d(A,P) \approx d(A,N)$

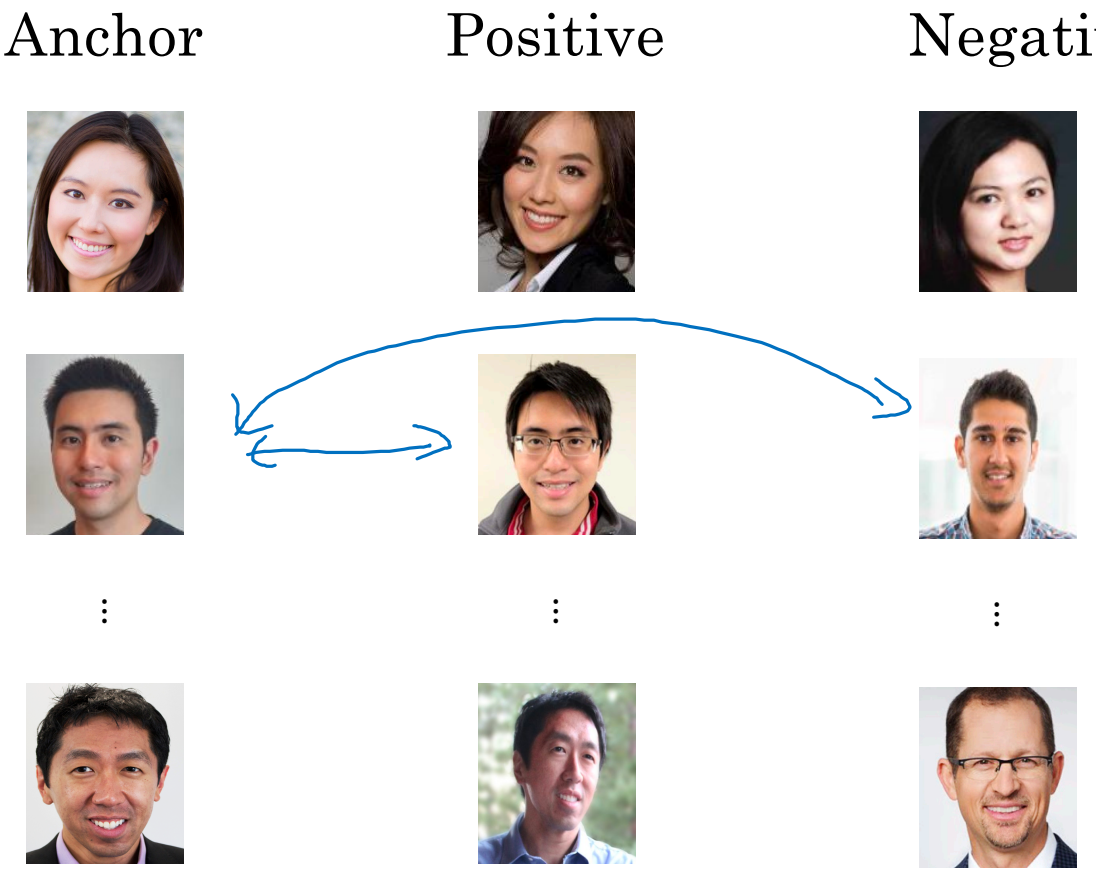
↓ ↑

FaceNet

DeepFace

[Schroff et al.,2015, FaceNet: A unified embedding for face recognition and clustering]

Training set using triplet loss



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