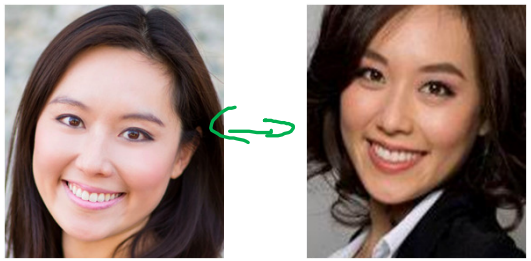
deeplearning.ai

Face recognition

Triplet loss

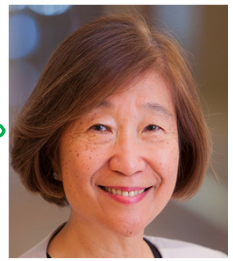
Learning Objective



Anchor

Positive

Anchor



Negative

$d(A,P) = 0.5$ (P)

$d(A,N) = 0.5$ ~~0.5~~ 0.7 (N)

Want: $\|f(A) - f(P)\|^2 + \alpha \leq \|f(A) - f(N)\|^2$ ($\alpha = 0.2$)

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

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

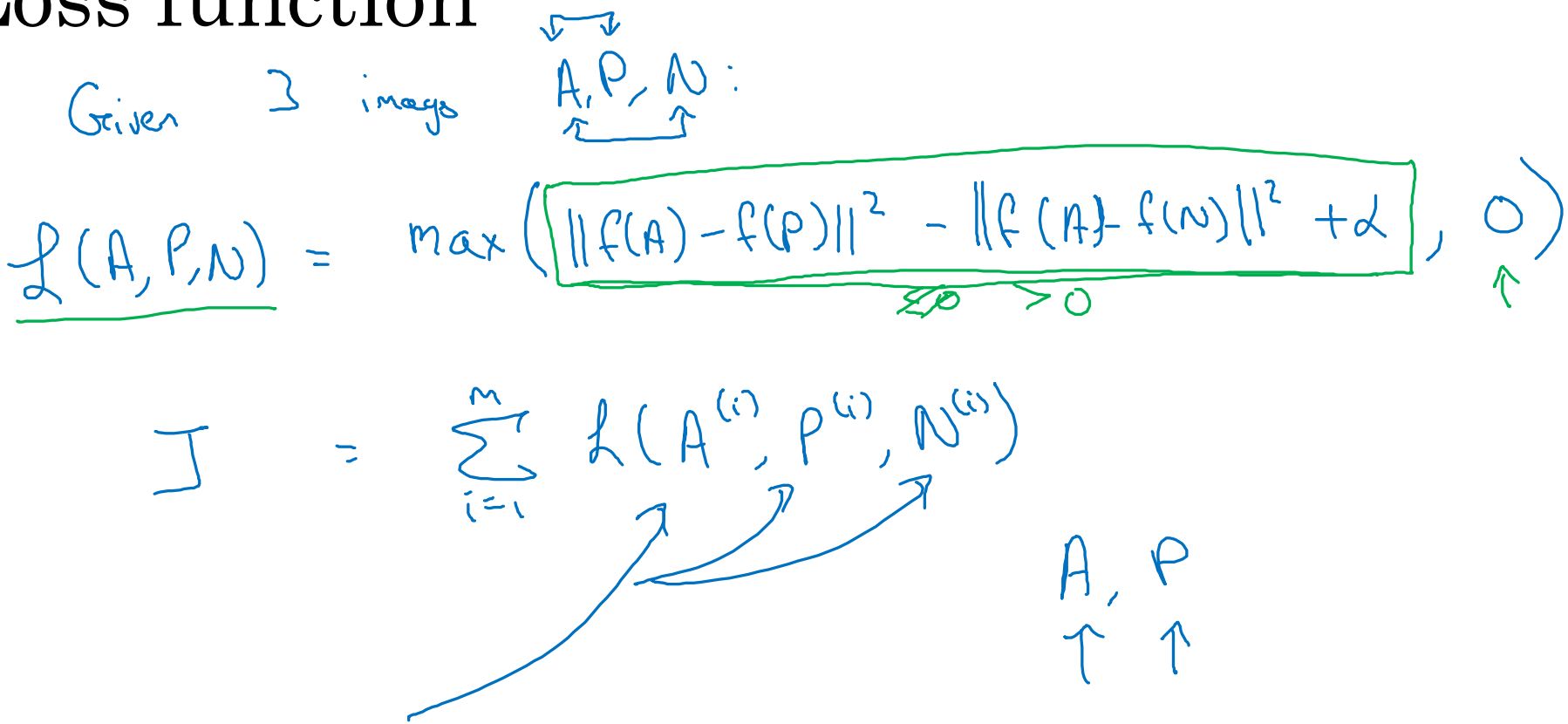
0 $\qquad$ 0 $\qquad$ margin

$\nabla = 0$

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

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

Loss function



Training set: 10k pictures of 1k persons

[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.

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

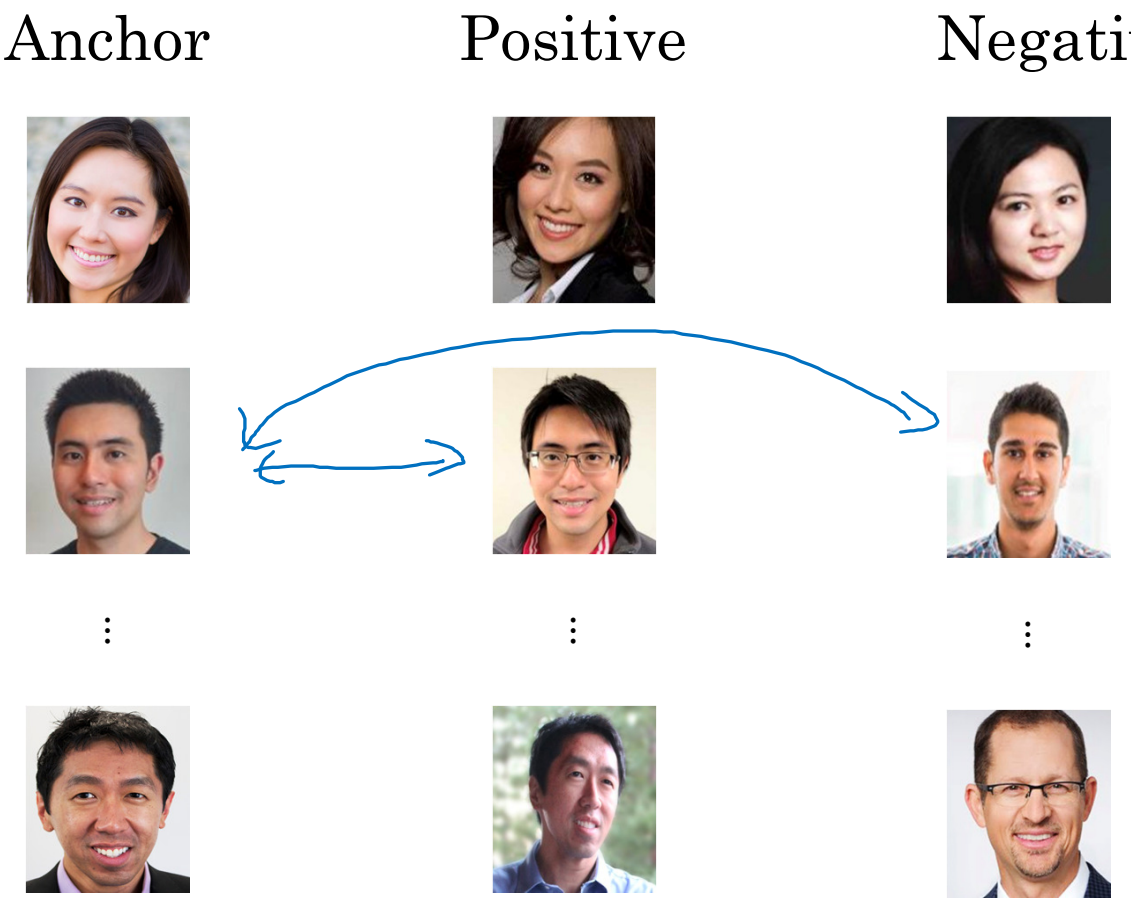
$d(A,P) \approx d(A,N)$

FaceNet

DeepFace

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

Training set using triplet loss



J

$d(x^{(i)}, x^{(j)})$

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