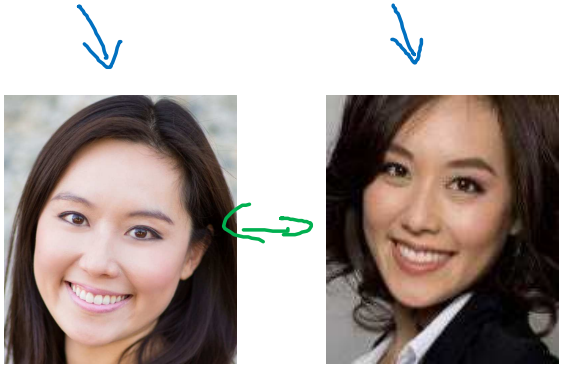
deeplearning.ai

Face recognition

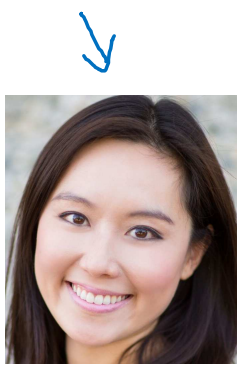
Triplet loss

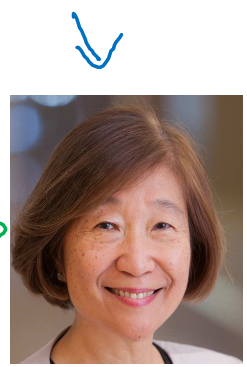
Learning Objective



Anchor

Positive





Anchor

Negative

A $d(A,P) = 0.5$ P $+0.2$

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

A $d(A,N) = \cancel{0.5}\ 0.7$ N

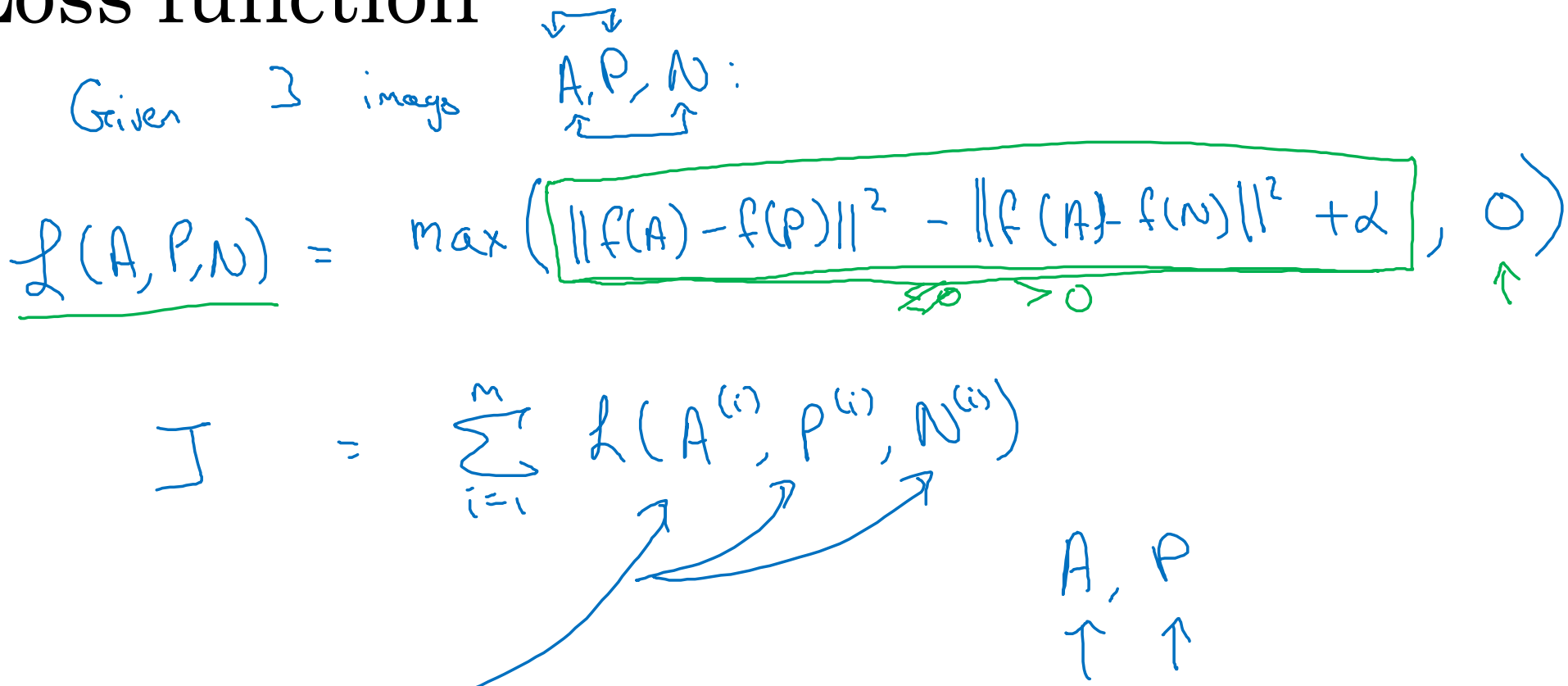
$$\|f(A) - f(P)\|^2 - \|f(A) - f(N)\|^2 + \alpha \leq 0$$

0 0 α = margin

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

[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.

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

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

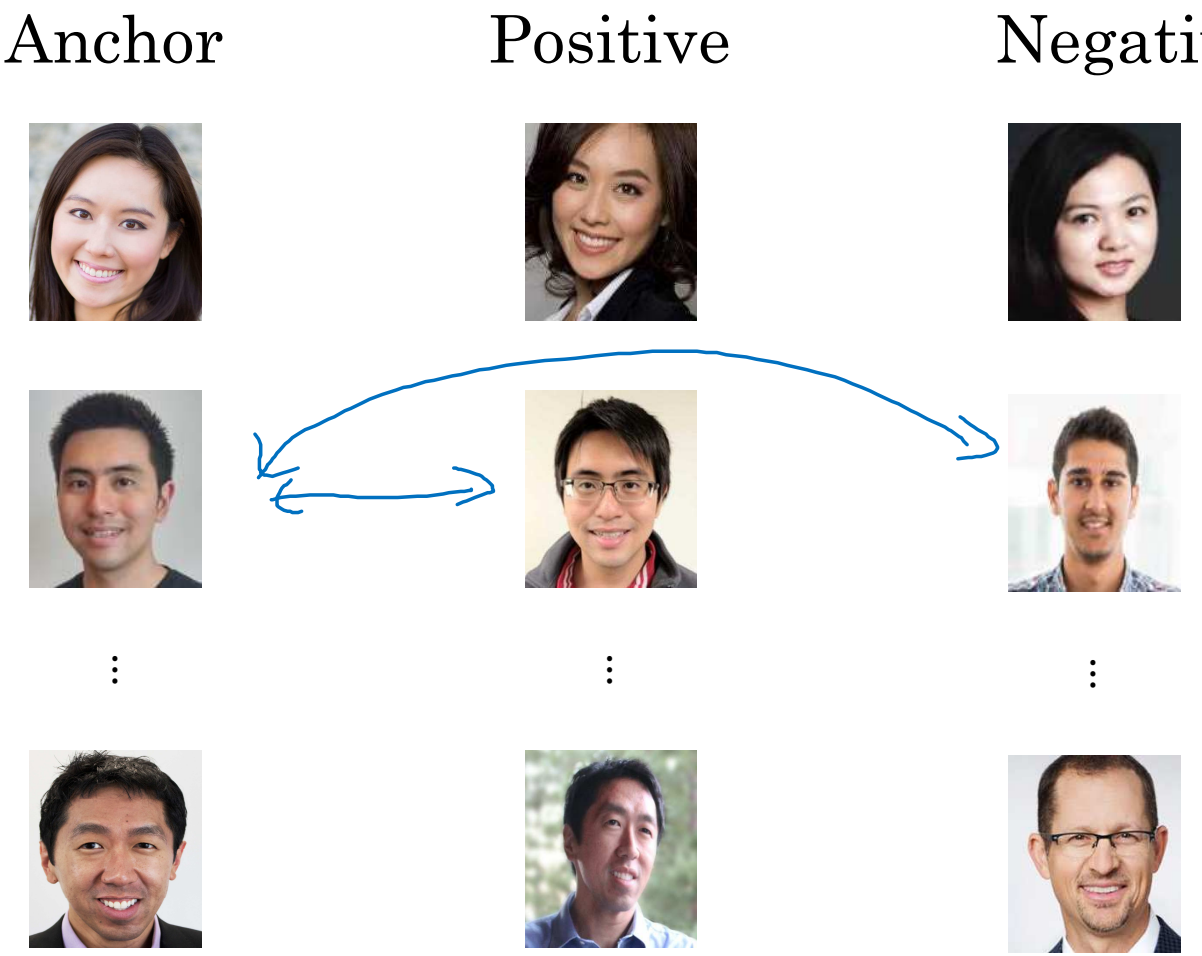
↓ ↑

Face Net

Deep Face

[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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