

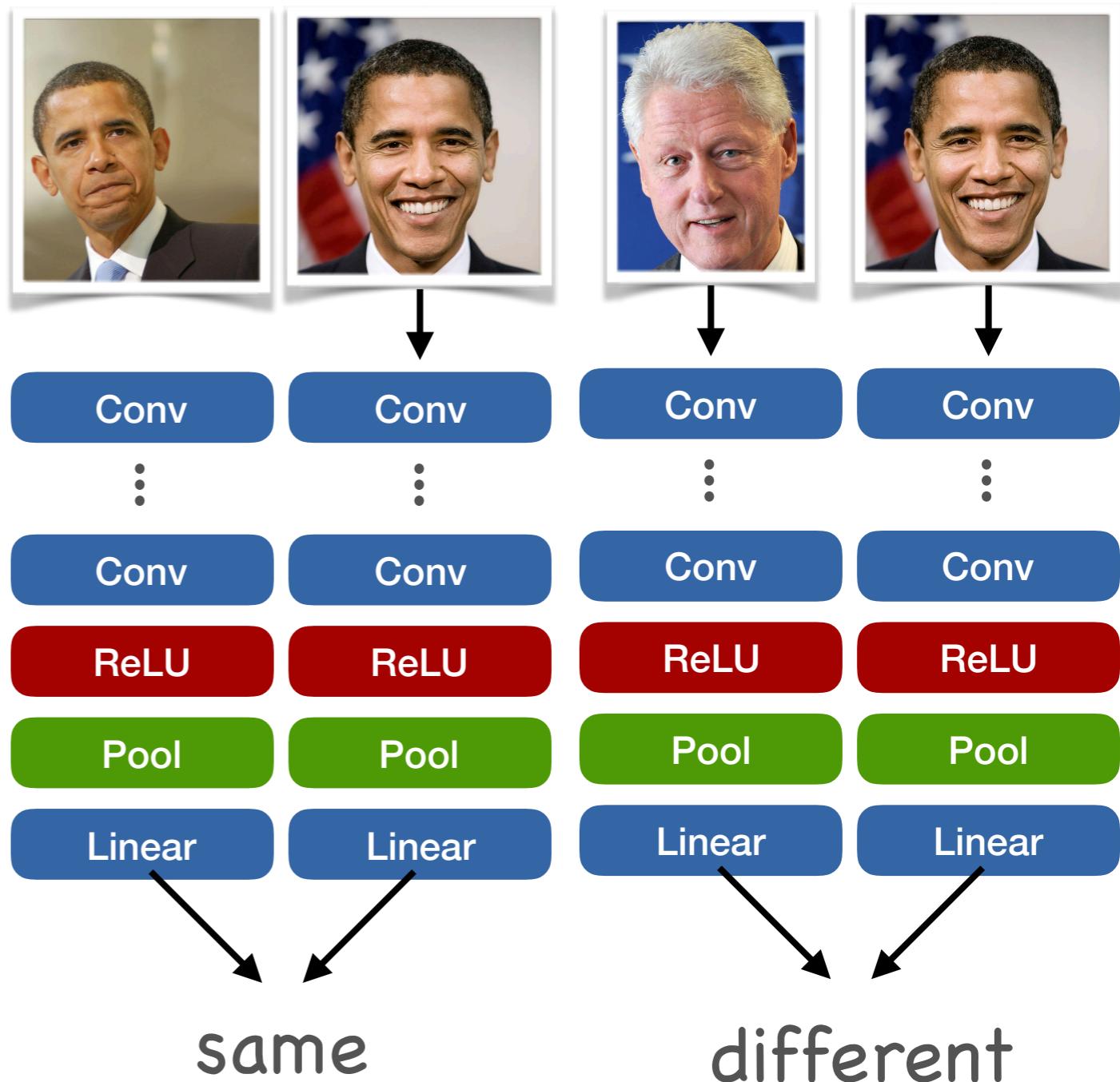
Contrastive loss

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Embedding learning

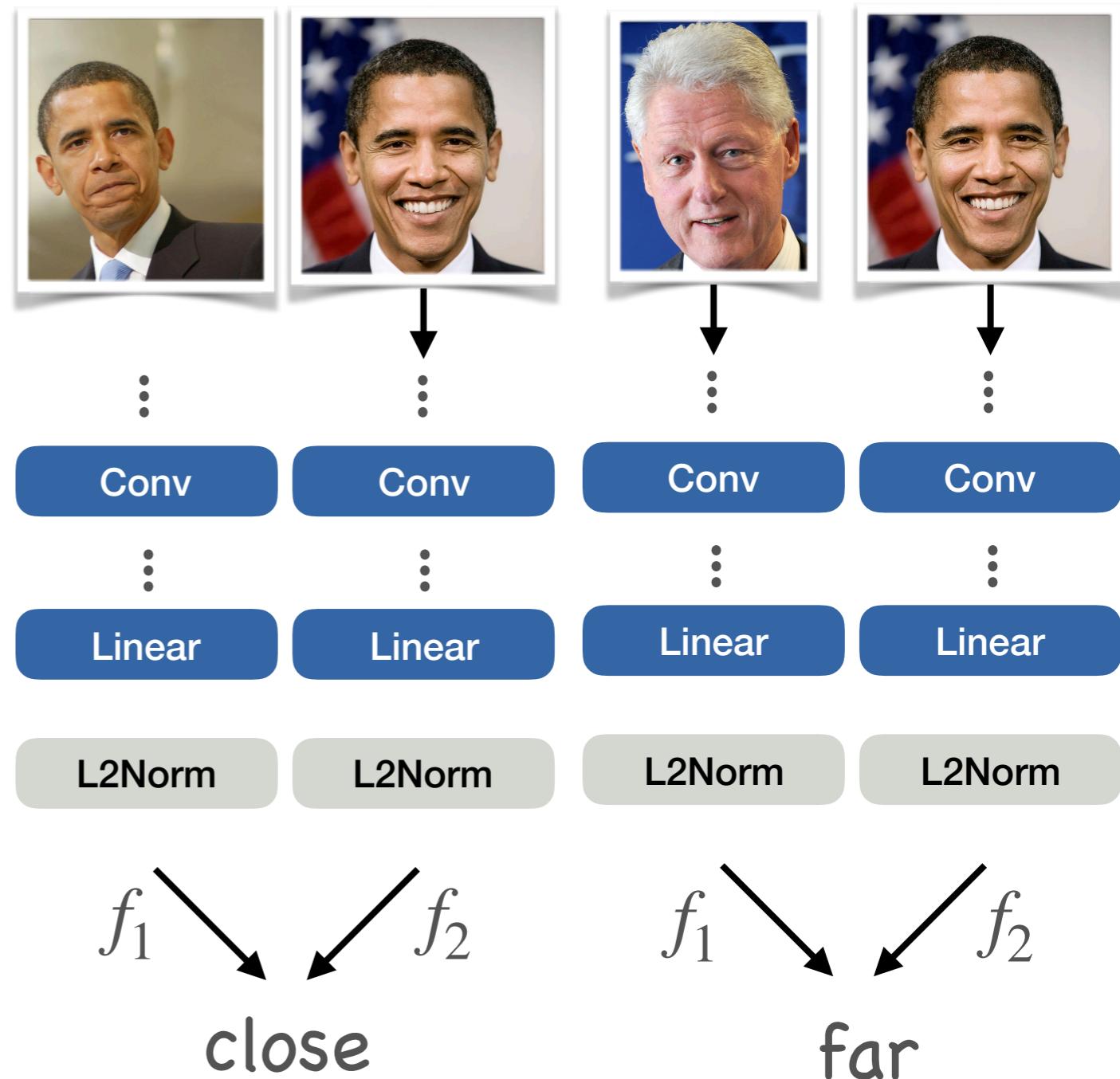
- Embedding network

- Positive and negative samples



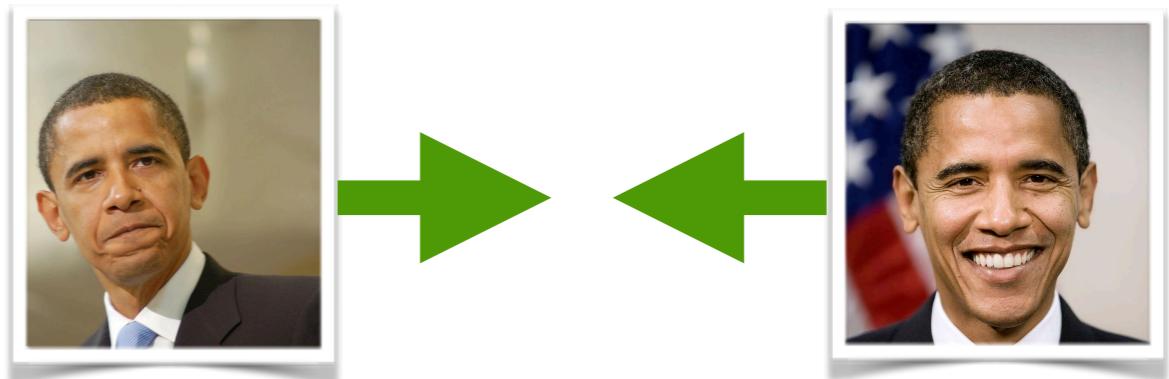
Objective

- Positives
 - $\|f_1 - f_2\| < c$
- Negatives
 - $\|f_1 - f_2\| > c$



Contrastive loss

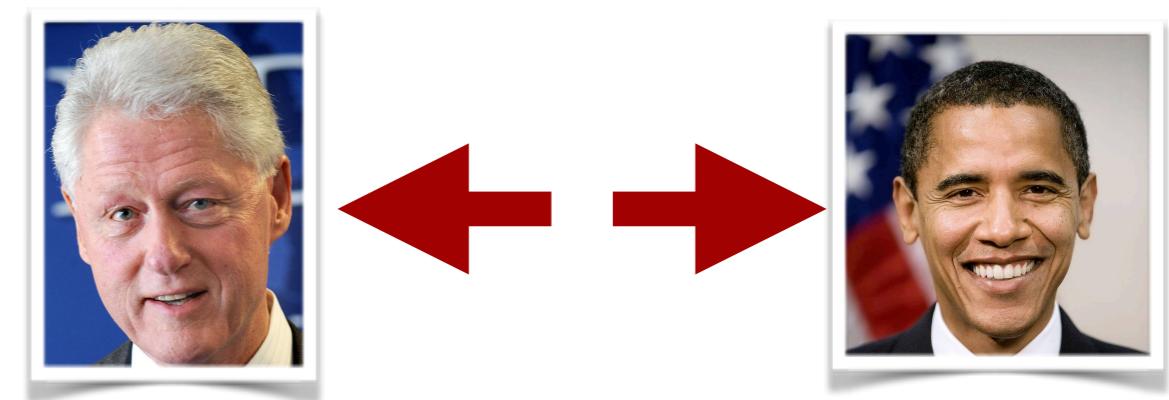
- Collapse positives



- $\|f_i - f_j\|$

- Separate negatives

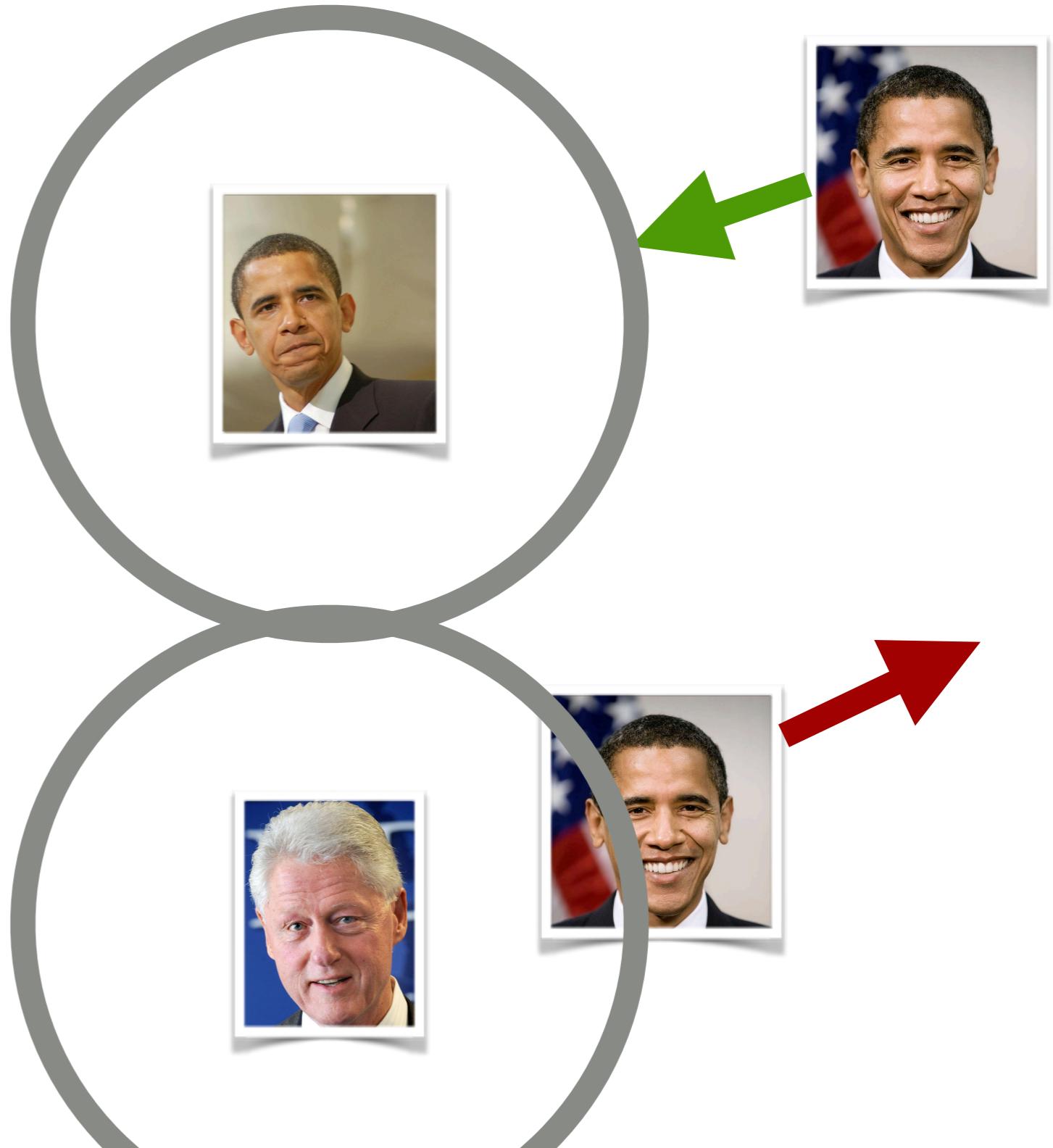
- $\max(c - \|f_i - f_j\|, 0)$



Dimensionality reduction by learning an invariant mapping, Hadsell et al., CVPR 2006

Margin based loss

- Collapse positives
 - $\max(\|f_i - f_j\| - c, 0)$
- Separate negatives
 - $\max(c - \|f_i - f_j\|, 0)$



Contrastive and margin based losses

- Fix thresholds

