

# Face Recognition with One Shot Learning

Prepared by

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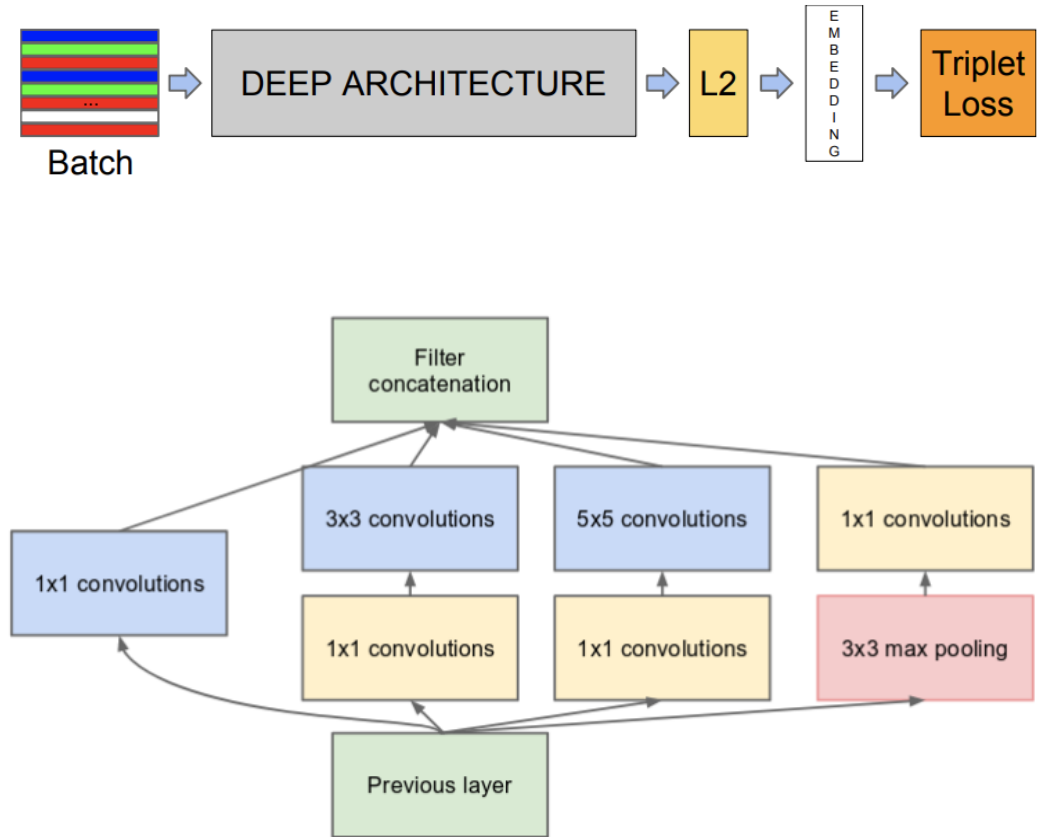
# Problem Definition

- A dataset of facial images of celebrities
- Only 2-50 images for each celebrity
- Need to identify new facial image



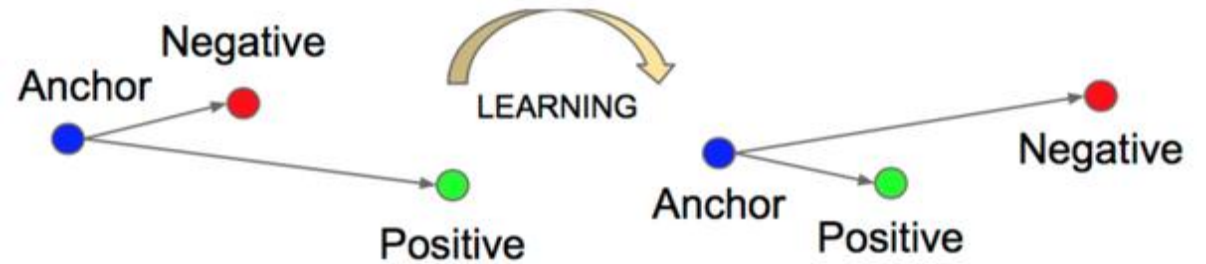
# Architecture

- Inception Resnet v1
- Outputs feature vectors (528,)
- Total layers: 448
- Total params: 23,497,424
- Trainable params: 23,467,824
- Non-trainable params: 29,600



# Loss

- Triplet loss
- $d(\text{anchor}, \text{negative}) > d(\text{anchor}, \text{positive}) + \text{margin}$
- $\text{Loss} = \max(d(\text{anchor}, \text{positive}) + \text{margin} - d(\text{anchor}, \text{negative}), 0)$
- Online semi hard triplets



# Accuracy

Model	Validation Accuracy (%)	Test Accuracy (%)
Facenet	88.25	-
Facenet (2 added layers)	86.05	-
Facenet (last 2 layers trained)	90.01	-
Facenet (last 3 layers trained)	90.07	-
Facenet (last 21 layers trained)	92.03	90.51

# Challenges

- Dataset was very small.
- Facenet could not be fine-tuned due to computational resource scarcity.
- Small batch size made it harder to find triplets.
- Image resizing could be a potential problem.