

# Special applications: Face recognition & Neural style transfer

Quiz, 10 questions



**Congratulations! You passed!**

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1.  
Face verification requires comparing a new picture against one person's face, whereas face recognition requires comparing a new picture against K person's faces.

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2.  
Why do we learn a function  $d(img1, img2)$  for face verification? (Select all that apply.)

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3.  
In order to train the parameters of a face recognition system, it would be reasonable to use a training set comprising 100,000 pictures of 100,000 different persons.

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4.  
Which of the following is a correct definition of the triplet loss? Consider that  $\alpha > 0$ . (We encourage you to figure out the answer from first principles, rather than just refer to the lecture.)

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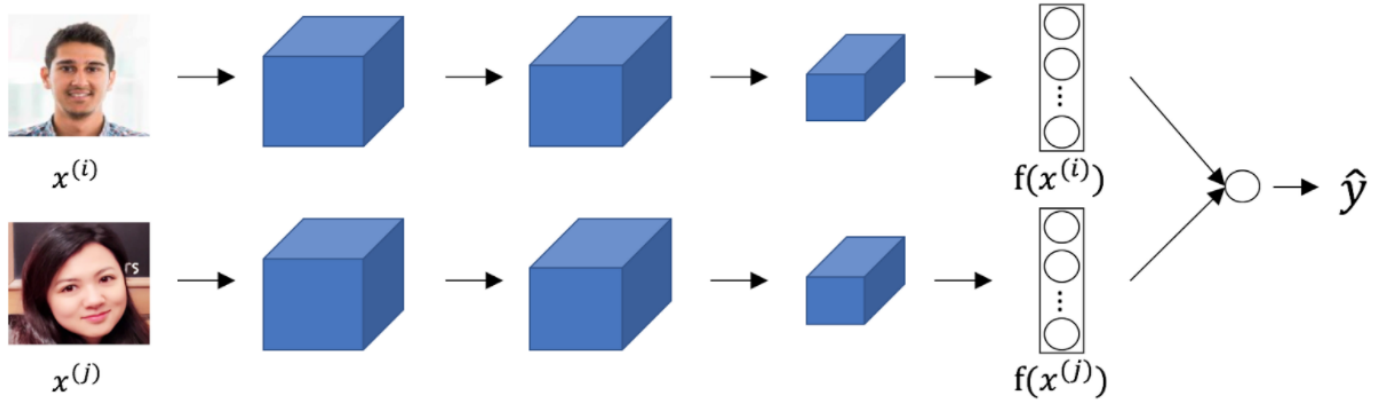
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5.

Consider the following Siamese network architecture:

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The upper and lower neural networks have different input images, but have exactly the same parameters.



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6.

You train a ConvNet on a dataset with 100 different classes. You wonder if you can find a hidden unit which responds strongly to pictures of cats. (I.e., a neuron so that, of all the input/training images that strongly activate that neuron, the majority are cat pictures.) You are more likely to find this unit in layer 4 of the network than in layer 1.



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7.

Neural style transfer is trained as a supervised learning task in which the goal is to input two images ( $x$ ), and train a network to output a new, synthesized image ( $y$ ).



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8.

In the deeper layers of a ConvNet, each channel corresponds to a different feature detector. The style matrix  $G^{[l]}$  measures the degree to which the activations of different feature detectors in layer  $l$  vary (or correlate) together with each other.



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## 9. Special applications: Face recognition & Neural style transfer

In neural style transfer, what is updated in each iteration of the optimization algorithm?

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10.  
You are working with 3D data. You are building a network layer whose input volume has size  $32 \times 32 \times 32 \times 16$  (this volume has 16 channels), and applies convolutions with 32 filters of dimension  $3 \times 3 \times 3$  (no padding, stride 1). What is the resulting output volume?

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