Special Applications: Face Recognition & Neural Style Transfer

1. Face verification and face recognition are the two most common names given to the task of comparing a new picture against one person's face. True/False?

1 / 1 point

- (●) False
- ( ) True

Expand

Correct

Correct. This is the description of face verification, but not of face recognition.

2. Why is the face verification problem considered a one-shot learning problem? Choose the best answer.

1 / 1 point

- ( ) Because we are trying to compare to one specific person only.
- (●) Because we might have only one example of the person we want to verify.
- ( ) Because we have only have to forward pass the image one time through our neural network for verification.
- ( ) Because of the sensitive nature of the problem, we won't have a chance to correct it if the network makes a mistake.

Expand

Correct

Correct. One-shot learning refers to the amount of data we have to solve a task.

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.

1 / 1 point

- (selected) False
- True

Expand

Correct
Correct, to train a network using the triplet loss you need several pictures of the same person.

4. Triplet loss:

0 / 1 point

$$\max\left(\|f(A)-f(P)\|^2-\|f(A)-f(N)\|^2+\alpha,0\right)$$

is larger in which of the following cases?

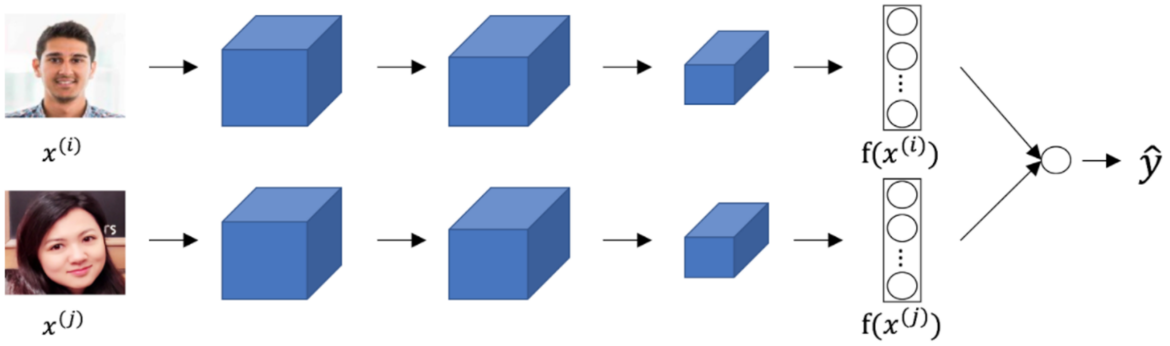
- When the encoding of A is closer to the encoding of N than to the encoding of P.
- When the encoding of A is closer to the encoding of P than to the encoding of N.
- (selected) When $A=P$ and $A=N$.

Expand

Incorrect
In this case, the triplet loss is α.

5.
Question 5

Consider the following Siamese network architecture:



The upper and lower networks share parameters to have a consistent encoding for both images. True/False?

The upper and lower networks share parameters to have a consistent encoding for both images. True/False?

- (●) True
- ( ) False

Expand

Correct
Correct. Part of the idea behind the Siamese network is to compare the encoding of the images, thus they must be consistent.

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.

1 / 1 point

- (●) True
- ( ) False

Expand

Correct
Yes, this neuron understands complex shapes (cat pictures) so it is more likely to be in a deeper layer than in the first layer.

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).

1 / 1 point

- ○ True
- ◉ False

Expand

Correct

Yes, Neural style transfer is about training the pixels of an image to make it look artistic, it is not learning any parameters.

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

1 / 1 point

- ○ The neural network parameters
- ○ The pixel values of the content image C
- ○ The regularization parameters
- ◉ The pixel values of the generated image G

Expand

Correct

Yes, neural style transfer is different from many of the algorithms you've seen up to now, because it doesn't learn any parameters; instead it learns directly the pixels of an image.

10. You are working with 3D data. The input "image" has size $32 \times 32 \times 32 \times 3$, if you apply a convolutional layer with 16 filters of size $4 \times 4 \times 4$, zero padding and stride 1. What is the size of the output volume?

1 / 1 point

- $31 \times 31 \times 31 \times 16$.
- $29 \times 29 \times 29 \times 13$.
- (selected) $29 \times 29 \times 29 \times 16$.
- $29 \times 29 \times 29 \times 3$.

Expand

Correct

Correct, we can use the formula $\lfloor \frac{n^{[l-1]} - f + 2 \times p}{s} \rfloor + 1 = n^{[l]}$ on the three first dimensions.