Congratulations! You passed!

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Go to next item

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

- False
- True

Expand

Correct
Correct.

2. Why is the face verification problem considered a one-shot learning problem? Choose the best answer. **1 / 1 point**

- Because we have only have to forward pass the image one time through our neural network for verification.
- Because we might have only one example of the person we want to verify.
- Because we are trying to compare to one specific person only.
- 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. You want to build a system that receives a person's face picture and determines if the person is inside a workgroup. You have pictures of all the faces of the people currently in the workgroup, but some members might leave, and some new members might be added. To train a system to solve this problem using the triplet loss you get many persons and take several pictures of each one. Which of the following do you agree with? (Select the best answer.) **0 / 1 point**

- It would be best to increase the number of persons in the dataset by taking only one picture of each person to have a more representative set of the population.
- You take several pictures of the same person to train $d(\text{img}_1, \text{img}_2)$ using the triplet loss.
- You take several pictures of the same person because this way you can get more pictures to train the network efficiently since you already have the person in place.
- You shouldn't use persons outside the workgroup you are interested in because that might create a high variance in your model.

Expand

Incorrect
To train using the triplet loss you need several pictures of the same person, so you don't do this only to increase the size of the dataset.

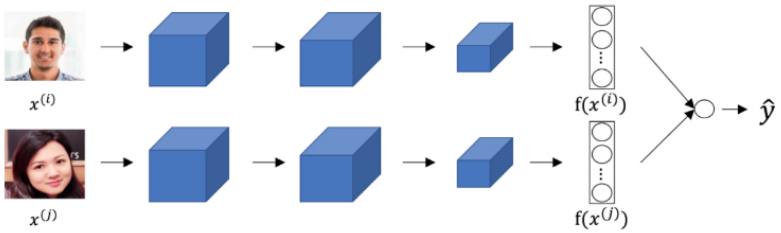
4. Which of the following is a correct definition of the triplet loss? Consider that $\alpha > 0$. (We encourage you to figure out the answer from first principles, rather than just refer to the lecture.) **1 / 1 point**

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

Expand

Correct
Correct

5. Consider the following Siamese network architecture: **1 / 1 point**



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 uses images Content C, Style S. The loss function used to generate image G is composed of which of the following: (Choose all that apply.) **1 / 1 point**

- [ ] J_{corr} that compares C and S.
- [x] $J_{content}$ that compares C and G.

Correct
Correct, in neural style transfer we are interested in the similarity between S and G, and the similarity between G and C.

- [ ] T that calculates the triplet loss between S, G, and C.
- [x] J_{style} that compares S and G.

Correct
Correct, in neural style transfer we are interested in the similarity between S and G, and the similarity between G and C.

Expand

Correct
Great, you got all the right answers.

8. In neural style transfer, we define style as: **1 / 1 point**

- (•) The correlation between activations across channels of an image.
- ( ) $\left\|a^{[l](S)} - a^{[l](G)}\right\|^2$ the distance between the activation of the style image and the content image.
- ( ) The correlation between the generated image G and the style image S.
- ( ) The correlation between the activation of the content image C and the style image S.

Expand

Correct
Correct, this correlation is represented by $G^{[l](I)}_{kk'}$ for the image I.

9. In neural style transfer, what is updated in each iteration of the optimization algorithm? **1 / 1 point**

- (•) The pixel values of the generated image G
- ( ) The pixel values of the content image C
- ( ) The regularization parameters
- ( ) The neural network parameters

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. You are building a network layer whose input volume has size 32x32x32x16 (this volume has 16 channels), and applies convolutions with 32 filters of dimension 3x3x3x16 (no padding, stride 1). What is the resulting output volume? **1 / 1 point**

- ( ) 30x30x30x16
- (•) 30x30x30x32
- ( ) Undefined: This convolution step is impossible and cannot be performed because the dimensions specified don't match up.

Expand

Correct

Correct, you have used the formula $\lfloor \frac{n^{[l-1]} - f + 2 \times p}{s} \rfloor + 1 = n^{[l]}$ over the three first dimensions of the input data.