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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 persons' faces. **1 / 1 point**

- (•) True
- ( ) False

Expand

Correct
Correct.

2. 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. Which of the following do you agree with? **1 / 1 point**

- [x] It will be more efficient to learn a function $d(\text{img}_1, \text{img}_2)$ for this task.

Correct
Correct. Since this is a one-shot learning task this function will allow us to compare two images to verify identity.

- [ ] It is best to build a convolutional neural network with a softmax output with as many outputs as members of the group.
- [ ] This can't be considered a one-shot learning task since there might be many members in the workgroup.
- [x] This can be considered a one-shot learning task.

Correct
Correct. Since we might have only one example of the person we want to recognize.

Expand

Correct
Great, you got all the right answers.

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 must collect pictures of different faces from only the current members of the team. True/False? **0 / 1 point**

- (•) True
- ( ) False

Expand

Incorrect
Incorrect. Although it is necessary to have several pictures of the same person, it is not absolutely necessary that all the pictures only come from current members of the team.

4. Triplet loss: **1 / 1 point**

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

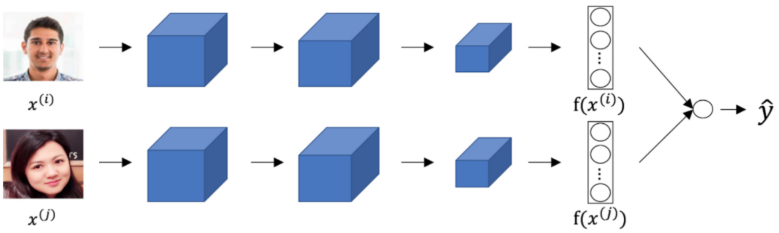
is larger in which of the following cases?

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

Expand

Correct
Correct. In this case $$\left | f(A) - f(P) \right |^2 - \left | f(A) - f(N) \right |^2$$ is positive thus the triplet loss gives a positive value larger than $$\alpha$$.

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



Which of the following do you agree with the most?

- Although we depict two neural networks and two images, the two images are combined in a single volume and pass through a single neural network.
- The two neural networks depicted in the image have the same architecture, but they might have different parameters.
- The upper and lower neural networks depicted have exactly the same parameters, but the outputs are computed independently for each image.
- This depicts two *different* neural networks with different architectures, although we use the same drawing.

Expand

Correct
Correct. Both neural networks share the same weights, and each image passes through the neural network in an independent manner.

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_{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.

- [ ] T that calculates the triplet loss between S, G, and C.
- [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.

Expand

Correct
Great, you got all the right answers.

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. **1 / 1 point**

- ( ) False
- (•) True

Expand

Correct
Yes, the style matrix $$G^{[l]}$$ can be seen as a matrix of cross-correlations between the different feature detectors.

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

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

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 $64 \times 64 \times 64 \times 3$, if you apply a convolutional layer with 16 filters of size $4 \times 4 \times 4$, zero padding and stride 2. What is the size of the output volume? **1 / 1 point**

- (•) $31 \times 31 \times 31 \times 16$.

- $61 \times 61 \times 61 \times 14$.
- $64 \times 64 \times 64 \times 3$.
- $31 \times 31 \times 31 \times 3$.

Expand

Correct

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