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Grade received 100% To pass 80% or higher

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Special Applications: Face Recognition & Neural Style Transfer

Latest Submission Grade 100%

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 do we learn a function $d(img1, img2)$ for face verification? (Select all that apply.) — 1 / 1 point

- [ ] Given how few images we have per person, we need to apply transfer learning.
- [ ] This allows us to learn to predict a person's identity using a softmax output unit, where the number of classes equals the number of persons in the database plus 1 (for the final "not in database" class).
- [x] This allows us to learn to recognize a new person given just a single image of that person.

✓ **Correct**
Yes.

- [x] We need to solve a one-shot learning problem.

✓ **Correct**
This is true as explained in the lecture.

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? — 1 / 1 point

- (•) False
- ( ) True

Expand

✓ **Correct**
Correct. 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.

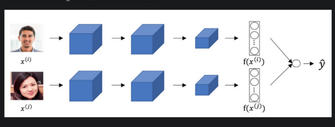
4. Which of the following is a correct definition of the triplet loss? Consider that $\alpha > 0$. (We encourage you to figure out the answer from first principles, rather than just refer to the lecture.) — 1 / 1 point

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

Expand

✓ **Correct**
Correct

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



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

- (•) True
- ( ) False

Expand

✓ **Correct**
Yes it is true, parameters are shared among these two networks.

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

- [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.

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

Expand

✓ **Correct**
Correct, this correlation is represented by $G_{ik}^{[l](I)}$ for the image I.

9. In neural style transfer, which of the following better express the gradients used? — 1 / 1 point

- (•) $\frac{\partial J}{\partial G}$
- ( ) $\frac{\partial J}{\partial W^{[l]}}$
- ( ) $\frac{\partial J}{\partial S}$
- ( ) Neural style transfer doesn't use gradient descent since there are no trainable parameters.

Expand

✓ **Correct**
Correct, we use the gradient of the cost function over the value of the pixels of the generated 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

- ( ) $61 \times 61 \times 61 \times 14$
- ( ) $31 \times 31 \times 31 \times 3$
- ( ) $64 \times 64 \times 64 \times 3$
- (•) $31 \times 31 \times 31 \times 16$

Expand

✓ **Correct**
Correct, we can use the formula $[\frac{(l-1)-f+2*pad}{stride}] + 1 = n^{[l]}$ to the three first dimensions.