DLFA Spring 2022 - Quiz 2

Instructions:

- Exam time: 8:00 PM to 8:55 PM
- Duration: 55 minutes.
- Total questions: 20
- Marks per question: 0.5
- Total marks: 10
- ALL QUESTIONS ARE MANDATORY.
- No negative marks.

All the best!!

1. **A segmentation system produces two segmentation maps for an image containing background in addition to one object class without any errors. In one segmentation map only the regions corresponding to the object class are labeled as "True", and in another segmentation map only the regions corresponding to the background are labeled as "True". If the intersection of the two segmentation maps for "True" value is taken, which of the regions of the resultant map will have "True" values?** *
(0.5 Points)

   ○ Areas where the background is present

   ○ Cannot be determined

   ⦿ None

   ○ Areas where the object is present

2. **In U-Net, SegNet and SUMNet, which of the following is TRUE?** *
(0.5 Points)

   ○ None of U-Net, SegNet and SUMNet have an encoder

○ SegNet does not have a decoder

○ U-Net does not have an encoder

◉ U-Net and SUMNet both have a encoder

3. **What is a feature that SegNet possesses but U-Net does not?** *
   (0.5 Points)

◉ SegNet uses transferring of pooling indices for unpooling at matched depth of decoder

○ SegNet has fully connected layers

○ SegNet is a neural network architecture for classification

○ SegNet is a neural network architecture not used for segmentation

4. **What does "U" in U-Net signify?** *
   (0.5 Points)

○ The initials of the authors

◉ The visual shape of the architecture as illustrated by the authors looks like a "U"

○ "U" is for "upgraded"

○ No reason whatsoever

5. **In the case of Adversarial Autoencoder and Generative Adversarial Network, where does the discriminator take the latent representation as an input?**
   *
   (0.5 Points)

◉ Only in Adversarial Autoencoder

○ Neither in Adversarial Autoencoder nor in Generative Adversarial Network

○ Both in Adversarial Autoencoder and Generative Adversarial Network

○ Only in Adversarial Generative Adversarial Network

6. **In a binary segmentation map, what is the valid set of values corresponding to the pixel location for the areas which denotes the object class and the background respectively?** *
(0.5 Points)

○ All the other options

○ True and False

○ 1 and 0

○ White and black

7. **Which types of convolutional kernels are used in the original U-Net paper?**
*
(0.5 Points)

○ Only 5×5

○ Both 3×3 and 5×5

● Only 3×3

○ Only 7×7

8. **Which sections from VGG-16 are used in SegNet architecture?**
*
(0.5 Points)

○ Fully connected layers

● Convolutional layers

○ Neither convolutional layers not fully connected layers

○ Both convolutional layers and fully connected layers

9. **In semantic segmentation, if the input image contains background in addition to one object class only, then what is the minimum number of segmentation maps which should be generated by the network in order to infer the regions corresponding to the object as well as the background?**
   *

   (0.5 Points)

   ○ -1

   ○ 2

   ◉ 1

   ○ 0

10. **Consider an image which contains a region denoting a square object, a circle and a background. What is the minimum number of segmentation maps needed to segment all the regions as independent maps?**
    *

    (0.5 Points)

    ○ 0

    ○ 1

    ○ 3

    ◉ 2

11. **Which of the following is true about U-Net?** *
    (0.5 Points)

    ○ It is not used in super-resolution

    ○ Layers with transposed convolutions can never be used in U-Net architecture

    ◉ It was developed for image segmentation

    ○ It is a CNN architecture that was developed for the image classification task

12. **Does SegNet contain any fully connected layers?** *
(0.5 Points)

- ◉ No

- ○ Yes

- ○ Depends on the number of segmentation maps

- ○ Cannot be determined

13. **Is the spatial size of the output segmentation map generated by a U-Net the same as the spatial size of the input image provided to it?**
*
(0.5 Points)

- ○ Cannot be determined

- ○ Only in a few cases

- ○ Always

- ◉ Never

14. **What is the difference between semantic segmentation and instance segmentation?**
*
(0.5 Points)

- ○ None of the other options

- ○ Instance segmentation treats multiple objects of the same class as a single entity. On th other hand, semantic segmentation treats multiple objects of the same class as distinct individual objects

- ○ There is no difference

- ◉ Semantic segmentation treats multiple objects of the same class as a single entity. On the other hand, instance segmentation treats multiple objects of the same class as distinct individual objects

15. **Which of the following is true for semantic segmentation?**
    *
    (0.5 Points)

    ○ It has applications in autonomous driving, industrial inspection, and medical imaging analysis

    ○ Semantic segmentation output has the same dimension as the input image dimension

    ○ Semantic segmentation can be considered as a pixel-wise classification problem

    ● All of the other options

16. **At the end of training of an Adversarial Autoencoder, the accuracy of the discriminator is expected to be?**
    *
    (0.5 Points)

    ○ 66.67%

    ○ 100%

    ○ 0%

    ● 50%

17. **Which of the following are present in SegNet?** *
    (0.5 Points)

    ○ Neither encoder not decoder

    ● Both encoder and decoder

    ○ Decoder

    ○ Encoder

18. **In respect of "Latent Representation" of an input image obtained from the encoder of an Adversarial Autoencoder, which of the following is predominantly true?** *
(0.5 Points)

○ Dimension of the latent representation cannot be compared to that of the input

○ Dimension of the latent representation is larger than that of the input

○ Dimension of the latent representation is equal to that of the input

◉ Dimension of the latent representation is smaller than that of the input

19. **Which of the following is a concept that U-Net possesses but SegNet does not?** *
(0.5 Points)

○ U-Net is an network architecture for classification

○ U-Net uses channel concatenation

○ U-Net uses transferring of pooling indices

◉ U-Net is an network architecture for segmentation

20. **During backpropagation in a vector convolutional neural network, which of the following are updated?** *
(0.5 Points)

◉ Kernels without any rotations

○ Both kernels with and without rotations

○ Neither kernels with rotations nor kernels without rotations

○ Kernels with rotations

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