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

   - Cannot be determined
   - No
   - Depends on the number of segmentation maps
   - Yes

2. **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)

- Cannot be determined
- Areas where the object is present
- Areas where the background is present
- None

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

- "U" is for "upgraded"
- No reason whatsoever
- The initials of the authors
- The visual shape of the architecture as illustrated by the authors looks like a "U"

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

- Neither kernels with rotations nor kernels without rotations
- Kernels without any rotations
- Kernels with rotations
- Both kernels with and without rotations

5. **Which sections from VGG-16 are used in SegNet architecture?** *

(0.5 Points)

- (●) Convolutional layers
- ( ) Fully connected layers
- ( ) Both convolutional layers and fully connected layers
- ( ) Neither convolutional layers not fully connected layers

6. **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 is equal to that of the input
- (●) Dimension of the latent representation is smaller than that of the input
- ( ) Dimension of the latent representation is larger than that of the input
- ( ) Dimension of the latent representation cannot be compared to that of the input

7. **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
- ( ) -1
- ( ) 0
- (●) 2

8. **Which of the following is true for semantic segmentation?** *

(0.5 Points)

- [x] All of the other options
- [ ] Semantic segmentation can be considered as a pixel-wise classification problem
- [ ] It has applications in autonomous driving, industrial inspection, and medical imaging analysis
- [ ] Semantic segmentation output has the same dimension as the input image dimension

9. **Which of the following is true about U-Net?** *

(0.5 Points)

- [x] It was developed for image segmentation
- [ ] It is not used in super-resolution
- [ ] Layers with transposed convolutions can never be used in U-Net architecture
- [ ] It is a CNN architecture that was developed for the image classification task

10. **Which of the following is a concept that U-Net possesses but SegNet does not?** *

(0.5 Points)

- [ ] U-Net uses transferring of pooling indices
- [ ] U-Net is an network architecture for classification
- [ ] U-Net is an network architecture for segmentation
- [x] U-Net uses channel concatenation

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

- (●) Both encoder and decoder
- ( ) Neither encoder not decoder
- ( ) Encoder
- ( ) Decoder

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

- ( ) 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
- ( ) None of the other options
- ( ) Instance segmentation treats multiple objects of the same class as a single entity. On the other hand, semantic segmentation treats multiple objects of the same class as distinct individual objects

13. **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
- ( ) Only in Adversarial Generative Adversarial Network
- ( ) Both in Adversarial Autoencoder and Generative Adversarial Network
- ( ) Neither in Adversarial Autoencoder nor in Generative Adversarial Network

14. **At the end of training of an Adversarial Autoencoder, the accuracy of the discriminator is expected to be?** *

(0.5 Points)

- 100%
- 0%
- 66.67%
- 50%

15. **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)

- 1
- 0
- 2
- 3

16. **In U-Net, SegNet and SUMNet, which of the following is TRUE?** *

(0.5 Points)

- SegNet does not have a decoder
- U-Net does not have an encoder
- U-Net and SUMNet both have a encoder
- None of U-Net, SegNet and SUMNet have an encoder

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

- SegNet is a neural network architecture for classification
- SegNet has fully connected layers
- SegNet is a neural network architecture not used for segmentation
- SegNet uses transferring of pooling indices for unpooling at matched depth of decoder

18. **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 7×7
- Only 3×3

19. **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)

- White and black
- True and False
- 1 and 0
- All the other options

20. **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
- ◉ Always
- ○ Only in a few cases
- ○ Never