

1. If you have an input of size 10×10 and a filter of size 3×3 , what will be the size of the resulting feature map? Assume you apply no padding and your stride is 1. (2 points)

8×8

2. Briefly explain how the learning rate is different from the step size in deep learning. (2 points)

The learning rate tells us how much to update the weights.

Step size tells us how often to lower the learning rate.

3. Briefly explain the fine-tuning process in deep learning. (3 points)

See 622 #3

4. Briefly explain the purpose of max pooling in CNNs. (3 points)

See 622 #4

1. Assume you have an input of size $N \times N \times 3$. What filter size would you need to get a feature map of size $N - 3 \times N - 3$? (2 points)

~~3x3~~
 $4 \times 4 \times 3$

2. True/False: There is no way to exactly replicate a fully connected network with a CNN. Briefly explain. (2 points)

False.

you can use filters that are the same size as the input to replicate the fully connected network behavior.

3. Briefly explain the fine-tuning process in deep learning. (3 points)

you train a model on a large scale dataset for a different, but related problem.

Once trained, you crop off the last layer and introduce a new classification layer with your new classes and random weights. Then you train with a lower learning rate.

4. Briefly explain the purpose of max pooling in CNNs. (3 points)

CNNs find correlations in the input. Max pooling allows the highest correlation in a neighborhood to dominate.