MACHINE LEARNING QUESTIONS

IT'S SEPTEMBER 22 SOMEWHERE AND HERE IS TODAY'S QUESTION

TODAY'S QUESTION

Pooling layers

Sienna realized she needed more than convolutional layers to process her image dataset.

After stacking a few convolutional layers, her model started to make progress. Unfortunately, only very similar images returned positive results. Sienna discovered that her model lacked translation invariance: it was paying too much attention to the precise location of every feature.

Fortunately, Sienna found out that she could use pooling layers.

Which of the following statements about pooling layers are correct?

› During the training process, the network will learn the best configuration for the pooling layer.
[INCORRECT]

> › A pooling layer with a stride of 2 will cut the number of feature maps from the previous convolutional layer in half.
> [INCORRECT]
>
> • Pooling layers create the same number of pooled feature maps.
> [YOU MISSED THIS ONE]
>
> › Average pooling and max pooling are two of the most common pooling operations.
> [CORRECT]

Let's see what's going on with this question:

Pooling layers don't have any learnable parameters. When designing the model, Sienna must specify the pooling operation and configuration she wants to use.

Pooling layers work on each feature map independently and, depending on the pool size and stride, downsample these feature maps. The result is always a new set of pooled feature maps. Therefore, the second choice is incorrect, but the third is correct.

Finally, Max Pooling and Average Pooling are the two most common pooling operations. Average Pooling computes the average value of each patch, while Max Pooling calculates the maximum value.

Recommended reading

- "Max Pooling in Convolutional Neural Network and Its Features" is a great introduction to Max Pooling.
- Check "A Gentle Introduction to Pooling Layers for Convolutional Neural Networks" for more information about how pooling layers work.

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