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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Deep Learning - IIT Ropar (course)

Course outline

About NPTEL ()

How does an NPTEL online course work? ()

Week 1 ()

Week 2 ()

Week 3 ()

week 4 ()

Week 5 ()

Week 6 ()

Week 7 ()

Week 8 ()

Week 9 ()

week 10 ()

Week 10 : Assignment 10

The due date for submitting this assignment has passed.

Due on 2024-10-02, 23:59 IST.

Assignment submitted on 2024-10-02, 11:11 IST

1) Consider an input image of size $1000 \times 1000 \times 10$ where 10 refers to the number of channels (Such images do exist!). Suppose we want to apply a convolution operation on the entire image by sliding a kernel of size $1 \times 1 \times d$. What should be the depth d of the kernel?

Yes, the answer is correct.

Score: 1

Accepted Answers:

(Type: Numeric) 10

1 point

2) For the same input image in Q1, suppose that we apply the following kernels of differing sizes.

1 point

$$K_1 : 3 \times 3$$

$$K_2 : 7 \times 7$$

$$K_3 : 17 \times 17$$

$$K_4 : 41 \times 41$$

Assume that stride $s = 1$ and no zero padding. Among all these kernels which one shrinks the output dimensions the most?

- ☐ K_1
☐ K_2
☐ K_3
☒ K_4

☐ The convolution operation (unit? unit=130&less on=131)

☐ Relation between input size, output size and filter size (unit? unit=130&less on=132)

☐ Convolutional Neural Networks (unit? unit=130&less on=133)

☐ Convolutional Neural Networks (Contd.) (unit? unit=130&less on=134)

☐ CNNs (success stories on ImageNet) (unit? unit=130&less on=135)

☐ CNNs (success stories on ImageNet) (Contd.) (unit? unit=130&less on=136)

☐ Image Classification continued (GoogLeNet and ResNet) (unit? unit=130&less on=137)

☐ Visualizing patches which maximally activate a neuron (unit?

K_4

Yes, the answer is correct.

Score: 1

Accepted Answers:

K_4

3) Which of the following statements about CNN is (are) true?

1 point

- ☒ CNN is a feed-forward network
- ☒ Weight sharing helps CNN layers to reduce the number of parameters
- ☐ CNN is suitable only for natural images
- ☐ The shape of the input to the CNN network should be square

Yes, the answer is correct.

Score: 1

Accepted Answers:

CNN is a feed-forward network

Weight sharing helps CNN layers to reduce the number of parameters

4) Consider an input image of size $100 \times 100 \times 1$. Suppose that we used kernel of size 3×3 , zero padding $P = 1$ and stride value $S = 3$. What will be the output dimension?

10

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 34

0 points

5) Consider an input image of size $100 \times 100 \times 3$. Suppose that we use 10 kernels (filters) each of size 1×1 , zero padding $P = 1$ and stride value $S = 2$. How many parameters are there? (assume no bias terms)

1 point

- ☐ 5
- ☐ 10
- ☐ 15
- ☒ 30

Yes, the answer is correct.

Score: 1

Accepted Answers:

30

6) Which statement is true about the size of filters in CNNs?

1 point

- ☐ The size of the filter does not affect the features it captures.
- ☐ The size of the filter only affects the computation time.
- ☒ Larger filters capture more global features.
- ☒ Smaller filters capture more local features.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Larger filters capture more global features.

unit=130&less
on=138)

☐ Visualizing
filters of a
CNN (unit?
unit=130&less
on=139)

☐ Occlusion
experiments
(unit?
unit=130&less
on=140)

☐ Finding
influence of
input pixels
using
backpropagati
on (unit?
unit=130&less
on=141)

☐ Guided
Backpropagati
on (unit?
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☐ Optimization
over images
(unit?
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☐ Create images
from
embeddings
(unit?
unit=130&less
on=144)

☐ Deep Dream
(unit?
unit=130&less
on=145)

☐ Deep Art (unit?
unit=130&less
on=146)

☐ Fooling Deep
Convolutional
Neural
Networks
(unit?
unit=130&less
on=147)

Smaller filters capture more local features.

7) What is the motivation behind using multiple filters in one Convolution layer?

1 point

- ☐ Reduced complexity of the network
- ☐ Reduced size of the convolved image
- ☐ Insufficient information
- ☒ Each filter captures some feature of the image separately

Yes, the answer is correct.

Score: 1

Accepted Answers:

Each filter captures some feature of the image separately

8) Which of the following architectures has the highest no of layers?

1 point

- ☐ AlexNet
- ☐ GoogleNet
- ☒ ResNet
- ☐ VGG

Yes, the answer is correct.

Score: 1

Accepted Answers:

ResNet

9) What is the purpose of guided backpropagation in CNNs?

1 point

- ☐ To train the CNN to improve its accuracy on a given task.
- ☐ To reduce the size of the input images in order to speed up computation.
- ☒ To visualize which pixels in an image are most important for a particular class prediction.
- ☐ None of the above.

Yes, the answer is correct.

Score: 1

Accepted Answers:

To visualize which pixels in an image are most important for a particular class prediction.

10) Which of the following statements is true regarding the occlusion experiment in a CNN?

1 point

- ☐ It is a technique used to prevent overfitting in deep learning models.
- ☐ It is used to increase the number of filters in a convolutional layer.
- ☐ It is used to determine the importance of each feature map in the output of the network.
- ☒ It involves masking a portion of the input image with a patch of zeroes.

Partially Correct.

Score: 0.5

Accepted Answers:

It is used to determine the importance of each feature map in the output of the network.

It involves masking a portion of the input image with a patch of zeroes.

☐ Lecture
Material for
Week 10
(unit?
unit=130&less
on=148)

☐ Week 10
Feedback
Form: Deep
Learning - IIT
Ropar (unit?
unit=130&less
on=193)

☒ **Quiz: Week
10 :
Assignment
10
(assessment?
name=298)**

Week 11 ()

Week 12 ()

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Session -
July 2024 ()**