Unit 2 - Week 1

Assignment 1

The due date for submitting this assignment has passed. **Due on 2018-02-05, 23:59 IST.**

Assignment submitted on 2018-02-02, 22:56 IST

1) What are the commonly used software tools for visual computing? *1 point*

- (•) Pytorch
- ( ) Convolutional neural networks
- ( ) Machine learning
- ( ) Computer Vision

Yes, the answer is correct.
Score: 1

Accepted Answers:
Pytorch

2) What is the major feature for employing GPUs in machine vision? *1 point*

- ( ) Better accuracy
- ( ) Less cost
- ( ) Faster convergence
- (•) Parallel computing

Yes, the answer is correct.
Score: 1

Accepted Answers:
Parallel computing

3) What is the market for machine vision for 2020? *1 point*

- ( ) 6 Billion
- ( ) 3.5 Billion
- ( ) 6.5 Billion
- (•) 9.5 Billion

Yes, the answer is correct.
Score: 1

Accepted Answers:
9.5 Billion

4) Which of the following is a statistical texture metric? *1 point*

- (•) Local Binary Patterns
- ( ) Orientation Histogram
- ( ) Wavelets
- ( ) Fourier Coefficients

No, the answer is incorrect.
Score: 0

Accepted Answers:
Orientation Histogram

5) The size of the Co-occurrence matrix depends on *1 point*

- ( ) None of these
- ( ) Image contrast
- ( ) Image entropy
- (•) Gray levels in image

Yes, the answer is correct.
Score: 1

Accepted Answers:
Gray levels in image

6) Which of the factors govern high frequency attributes of Gabor wavelet? **1 point**

- Centroid of receptive field
- Spatial frequency
- All of these
- Standard deviation of Gaussian

No, the answer is incorrect.
Score: 0

Accepted Answers:
Spatial frequency

7) What is the output of sigmoid function for an input with dynamic range $[0, \infty]$? **1 point**

- [0.5, 1]
- [-1, 1]
- [0, 1]
- [0.25, 1]

Yes, the answer is correct.
Score: 1

Accepted Answers:
[0.5, 1]

8) Assume a neural network with 100 input neurons, 50 hidden neurons and 2 output neurons. How many parameters are to be learned? **1 point**

- 5100
- 50
- 5152
- 10000

No, the answer is incorrect.
Score: 0

Accepted Answers:
5100

9) Which of the following function is used for classification? **1 point**

- Mean square error
- Negative log likelihood
- Absolute loss
- KL Divergence

No, the answer is incorrect.
Score: 0

Accepted Answers:
Negative log likelihood

10) What is the local binary pattern of **1 point**

$$\begin{matrix} 9 & 3 & 2 \\ 5 & 4 & 1 \\ 2 & 7 & 8 \end{matrix}$$

- 0 0 0 1 1 0 1 1
- 0 0 1 1 0 1 1 0
- 1 0 0 0 1 1 0 1
- 1 1 0 0 1 1 0 1

Yes, the answer is correct.
Score: 1

Accepted Answers:
0 0 0 1 1 0 1 1

Unit 3 - Week 2

Assignment 2

The due date for submitting this assignment has passed. **Due on 2018-02-07, 23:59 IST.**

Assignment submitted on 2018-02-05, 00:35 IST

1) Which of the following algorithms are said to be learning? *1 point*

- ○ Identifying hyper-plane to separate features representing different classes
- ○ Identifying objects for computer vision task
- ◉ Increase of performance with experience
- ○ Heuristically constructing intelligent feature descriptors

Yes, the answer is correct.
Score: 1

Accepted Answers:
Increase of performance with experience

2) Which of the following is dependent on other tasks? *1 point*

- ○ Salient segments
- ○ Part detection
- ◉ Scene description
- ○ Human detection

Yes, the answer is correct.
Score: 1

Accepted Answers:
Scene description

3) Multi layer perceptron architectures are expected to *1 point*

- ◉ Construct Feature descriptors
- ○ Not fall into local minima
- ○ Reduce loss
- ○ All of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Construct Feature descriptors

4) Deep learning established state-of-the-art performance in the field of *1 point*

- ○ Autonomous driving
- ○ Natural language processing
- ○ Medical imaging
- ◉ All of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
All of the above

5) In a MLP (multi layer perceptron) with sigmoid function which layers exhibit vanishing gradient property *1 point*

- ○ Intermediate layers
- ○ Non-differentiable loss block
- ◉ Layers near loss block
- ○ Initial layers

No, the answer is incorrect.
Score: 0

Accepted Answers:
Initial layers

VIDEOS

6) Given an image classification task which of the following approaches is commonly employed *1 point*

- Long Short Term Memory
- HOG + Support vector machines
- Texture features + Random forests
- Convolutional neural network with logistic regression

Yes, the answer is correct.
Score: 1

Accepted Answers:
Convolutional neural network with logistic regression

7) Consider a perceptron with weights as [2, 3, 4] and bias as 9. What is the output provided [1, 2, 3] as input? *1 point*

- 2.22
- 180
- 20
- 29

Yes, the answer is correct.
Score: 1

Accepted Answers:
29

8) Which of the following function is used for classification? *1 point*

- Negative log likelihood
- Mean square error
- Absolute loss
- KL Divergence

Yes, the answer is correct.
Score: 1

Accepted Answers:
Negative log likelihood

9) Assume a neural network with 100 input neurons, 50 hidden neurons and 2 output neurons. How many parameters are to be learned? *0 points*

- 10000
- 50
- 5152
- 5100

Yes, the answer is correct.
Score: 0

Accepted Answers:
5152

10) Which of the following is considered for correcting a weight during back propagation? *1 point*

- Gradient of error
- Negative gradient of error w.r.t weight
- Positive gradient of weight
- Negative gradient of weight

Yes, the answer is correct.
Score: 1

Accepted Answers:
Negative gradient of error w.r.t weight

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Unit 4 - Week 3

Assignment 3

The due date for submitting this assignment has passed. **Due on 2018-02-14, 23:59 IST.**

Assignment submitted on 2018-02-14, 23:49 IST

1) Which of the following models can be employed for unsupervised learning *1 point*

- Autoencoder
- Deep Belief Networks
- None
- Both

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both

2) Which of the following statements are true for a autoencoder (neglect bias): *1 point*

(i) Number of input perceptrons are equal to number of output perceptrons
(ii) It needs supervised labels
(iii) It is a regression algorithm

- (i) and (ii)
- (ii) and (iii)
- (i), (ii) and (iii)
- (i) and (iii)

Yes, the answer is correct.
Score: 1

Accepted Answers:
(i) and (iii)

3) What is the dimension of encoder weight matrix of an autoencoder (hidden units=400) constructed to handle 10 dimensional input samples *1 point*

- rows = 400 and columns = 11
- rows = 400 and columns = 10
- rows = 11 and columns = 400
- rows = 10 and columns = 401

Yes, the answer is correct.
Score: 1

Accepted Answers:
rows = 400 and columns = 11

4) What is the dimension of decoder weight matrix of an autoencoder (hidden units=400) constructed to handle 10 dimensional input samples *1 point*

- rows = 11 and columns = 400
- rows = 10 and columns = 401
- rows = 400 and columns = 11
- rows = 400 and columns = 10

Yes, the answer is correct.
Score: 1

Accepted Answers:
rows = 10 and columns = 401

5) Which of the following cases is best suited for training SAE and transferring those weights to initialize deep neural network for classification **1 point**

- Ample unlabelled data and limited labelled data
- Big data and GPU
- Ample labelled data
- Any of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ample unlabelled data and limited labelled data

6) Which of the following statement is true for a trained SAE (n=3) with E1, E2 and E3 being autoencoders **1 point**

- None
- E3 is hierarchically more representative
- E1 is hierarchically more representative
- Number of E3 weights should be greater that E1

Yes, the answer is correct.
Score: 1

Accepted Answers:
E3 is hierarchically more representative

7) What should $E_n (n^{th}$ block) represent for an ideal SAE trained on face dataset **1 point**

- Edges
- Eigen face
- Curves
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Eigen face

8) While exporting DNN as feature extractor for patch classification what should be the last block? **1 point**

- Logistic regression
- Random forest
- Support vector machine
- Any of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Any of the above

9) What should E_1 (1^{st} encoder block) represent for an ideal SAE (stacked autoencoder) trained on MRI dataset **1 point**

- Corners
- Organs
- Edges
- Pathology

No, the answer is incorrect.
Score: 0

Accepted Answers:
Edges

10) Which loss function is used while training autoencoder **1 point**

- Logistic regression
- Hinge loss
- Any regression loss
- Any classification loss

Yes, the answer is correct.
Score: 1

Accepted Answers:
Any regression loss

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Unit 5 - Week 4

Assignment 4

The due date for submitting this assignment has passed. **Due on 2018-02-21, 23:59 IST.**

Assignment submitted on 2018-02-21, 17:55 IST

1) Given that E_n and D_n are encoder and decoder blocks of n^{th} autoencoder in SAE (Stacked autoencoder). ***1 point***
What is the sequence of blocks during end-to-end training of SAE (with $n = 2$)

- ○ $Input \rightarrow E_1 \rightarrow D_1 \rightarrow E_2 \rightarrow D_2 \rightarrow Input$
- ○ $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_1 \rightarrow D_2 \rightarrow Input$
- ◉ $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_2 \rightarrow D_1 \rightarrow Input$
- ○ Any of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:

$Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_2 \rightarrow D_1 \rightarrow Input$

2) Given a trained SAE ($n = 2$), how should the blocks be arranged for weight refinement (classification task) ***1 point***

- ○ $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_1 \rightarrow D_2 \rightarrow$ Logistic regression
- ◉ $Input \rightarrow E_1 \rightarrow E_2 \rightarrow$ Logistic regression
- ○ $Input \rightarrow E_1 \rightarrow E_2 \rightarrow D_1 \rightarrow D_2 \rightarrow$ Logistic regression
- ○ Any of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:

$Input \rightarrow E_1 \rightarrow E_2 \rightarrow$ *Logistic regression*

3) Given input x and linear autoencoder (no bias) with random weights (W for encoder and W' for decoder), ***1 point***
what mathematical form is minimized to achieve optimal weights

- ○ $|x - (W' \cdot W \cdot x)|$
- ○ $|x - (W' \cdot N_{fl}(W \cdot x))|$
- ◉ $|x - N_{fl}(W' \cdot N_{fl}(W \cdot x))|$
- ○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

$|x - (W' \cdot W \cdot x)|$

4) Given an linear autoencoder which encodes input x to z. For learning hierarchically high-level representation what should be the learning arrangement of second linear autoencoder (with weights W_2 and W_2') ***1 point***

- $|x - (W_2^{'} \cdot W_2 \cdot x)|$
- $|z - (W_2^{'} \cdot W_2 \cdot z)|$
- $|z - (W_2 \cdot W_1 \cdot x)|$
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
$|z - (W_2^{'} \cdot W_2 \cdot z)|$

5) In a de-noising autoencoder, noise is added to input for **1 point**

- Avoiding overfitting
- Robust feature extraction
- Data augmentation
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

6) In a linear autoencoder (without regularizer), if hidden layer perceptrons are equal to input layer perceptron then encoder and decoder weights are indulged to learn **1 point**

- Optimal representations
- Identity matrix
- Sparse representations
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Identity matrix

7) The role of regularizer in cost function is to **1 point**

- Avoid overfitting
- Induce sparsity
- Simpler hypothesis
- All of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
All of the above

8) Given feature vector X and corresponding label (y), logistic regression relates X and y in the form of (B is parameters to be learned) **1 point**

- $log(\frac{y}{1-y}) = BX$
- $y = BX$
- $y = \frac{1}{1+e^{BX}}$
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
$log(\frac{y}{1-y}) = BX$

9) Given feature vector X (with dimension j), corresponding label y (binary class) and weights ($b_1, b_2, .., b_k$) of logistic regressor, z be output (expected) of logistic regressor. What is the loss function (L) and gradient computed to correct the b_k based on chain rule **1 point**

-

$ylog(z)$ and $(y-z)x_k$

$y-log(z)$ and $\frac{\partial z}{\partial b_k}$

$ylog(z)+(1-y)(1-log(z))$ and $\frac{\partial L}{\partial z}\frac{\partial z}{\partial b_k}$

$ylog(z)+(1-y)(1-log(z))$ and $(y+z)x_k$

Yes, the answer is correct.
Score: 1

Accepted Answers:

$ylog(z) + (1 - y)(1 - log(z))$ and $\frac{\partial L}{\partial z}\frac{\partial z}{\partial b_k}$

10)What are the advantages of initializing MLP with pretrained autoencoder weights ***1 point***

(i) Faster Convergence
(ii) Avoid overfitting
(iii) Simpler hypothesis

- (i) and (ii)
- (ii) and (iii)
- (i) and (iii)
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
(i) and (ii)

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Unit 6 - Week 5

Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-02-28, 23:59 IST.**

Assignment submitted on 2018-02-28, 21:03 IST

1) Which of the following functions are used for classification *1 point*

(i) Binary cross entropy
(ii) Soft margin loss
(iii) Absolute loss
(iv) Mean squared error

- (i) and (ii)
- (ii) and (iii)
- (iii) and (iv)
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
(i) and (ii)

2) Which of the following functions are used for regression *1 point*

(i) Binary cross entropy
(ii) Soft margin loss
(iii) Absolute loss
(iv) Mean squared error

- (i) and (ii)
- (ii) and (iii)
- (iii) and (iv)
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
(iii) and (iv)

3) Which of the following loss function is employed for multi-class classification *1 point*

- Binary cross entropy
- Negative log likelihood
- L1 Loss
- MSE

No, the answer is incorrect.
Score: 0

Accepted Answers:
Negative log likelihood

4) Given a neural network with one output neuron (with sigmoid activation) for two class classification, which of the following loss function is used *1 point*

- Binary cross entropy
- Negative log likelihood
- L1 Loss
- MSE

Yes, the answer is correct.
Score: 1

Accepted Answers:
Binary cross entropy

5) Given a neural network with two output neurons (with log softmax activation) for two class classification, *1 point*

which of the following loss function is used

- ○ Binary cross entropy
- ◉ Negative log likelihood
- ○ L1 Loss
- ○ MSE

Yes, the answer is correct.
Score: 1

Accepted Answers:
Negative log likelihood

6) To employ margin loss for classification which transfer function should be used to transform the responses of output neurons **1 point**

- ○ Sigmoid
- ○ ReLU
- ○ Leaky ReLU
- ◉ Tanh

Yes, the answer is correct.
Score: 1

Accepted Answers:
Tanh

7) Which of the following loss is asymmetric in nature **1 point**

- ○ L1 Loss
- ○ MSE Loss
- ◉ Kullback-Leibler Divergence
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Kullback-Leibler Divergence

8) Which of the following loss is non differential **1 point**

- ◉ L1 Loss
- ○ MSE Loss
- ○ Kullback-Leibler Divergence
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
L1 Loss

9) Which of the following losses are combined while training sparse autoencoder **1 point**
(i) MSE
(ii) KL divergence
(iii) Absolute loss

- ◉ (i) and (ii)
- ○ (ii) and (iii)
- ○ (iii) and (i)
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
(i) and (ii)

10) Which of the following regression losses is more prone to outliers **1 point**

- ◉ MSE Loss
- ○ L1 Loss
- ○ Minimum (MSEloss, L1 loss)
- ○ Cross entropy

Yes, the answer is correct.
Score: 1

Accepted Answers:
MSE Loss

Unit 7 - Week 6

Assignment 6

The due date for submitting this assignment has passed. **Due on 2018-03-07, 23:59 IST.**

Assignment submitted on 2018-03-07, 23:29 IST

1) What should be the response dimension if an image of dimension $3 \times 25 \times 25$ is convoloved with a filter of dimension $3 \times 5 \times 5$? *1 point*

- (•) $1 \times 21 \times 21$
- ( ) $3 \times 25 \times 25$
- ( ) $1 \times 25 \times 25$
- ( ) $25 \times 25 \times 1$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$1 \times 21 \times 21$

2) What should be the response dimension if an image of dimension $3 \times 25 \times 25$ is padded with width of 2 and convoloved with a filter of dimension $3 \times 5 \times 5$? *1 point*

- ( ) $1 \times 21 \times 21$
- ( ) $3 \times 25 \times 25$
- (•) $1 \times 25 \times 25$
- ( ) $25 \times 25 \times 1$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$1 \times 25 \times 25$

3) What should be the response dimension if an image of dimension $3 \times 25 \times 25$ is convoloved with a filter of dimension $3 \times 5 \times 5$ and considered stride as 2 ? *1 point*

- ( ) $1 \times 11 \times 11$
- ( ) $3 \times 12.5 \times 12.5$
- ( ) $1 \times 12.5 \times 12.5$
- (•) $1 \times 12 \times 12$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1 \times 11 \times 11$

4) Including maxpooling equips the model to be invariant to _____ with in the limits of maxpooling kernel *1 point*

- ( ) Scale
- ( ) Translation

- Rotation
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Translation

5) Which of the following filter is functionally equivalent to maxpooling operation **1 point**

- Erosion
- Dilation
- Rank Filter
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Dilation

6) If the encoder part of an autoencoder with 784 input neurons and 100 hidden neurons can be rewrapped as a n convolutional filters each with a, b and c as input channels, filter height and filter width. What are the values of n, a, b and c **1 point**

Hint: Autoencoder is trained on gray scale image patches of size 28×28

- 1, 100, 28 and 28
- 100, 1, 28 and 28
- 28, 100, 1 and 28
- None of the abpve

No, the answer is incorrect.
Score: 0

Accepted Answers:
100, 1, 28 and 28

7) Which operation needs max pooling indices or switch variables? **1 point**

- Pooling
- Unpooling
- Activation
- Deconvolution

No, the answer is incorrect.
Score: 0

Accepted Answers:
Unpooling

8) Which operation needs learnable weights? **1 point**

- Pooling
- Unpooling
- Activation
- Deconvolution

Yes, the answer is correct.
Score: 1

Accepted Answers:
Deconvolution

9) What of the following activation function has no gradient for negative responses **1 point**

- Sigmoid
- Tanh
- ReLU
- Absolute

Yes, the answer is correct.
Score: 1

Accepted Answers:
ReLU

10) LeNet is designed for classification of **1 point**

- Alphabets
- Numbers or digits
- Images

None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Numbers or digits

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Unit 8 - Week 7

Assignment 7

The due date for submitting this assignment has passed. **Due on 2018-03-14, 23:59 IST.**

Assignment submitted on 2018-03-14, 16:52 IST

1) What advantage does convolutional autoencoder offer incomparision to vanilla autoencoder *1 point*

- ○ Scalable to large images
- ○ Feature extraction
- ○ Unsupervised
- ◉ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Scalable to large images

2) In convolutional autoencoder pooling layer is employed to *1 point*

- ○ Distribute gradients effectively
- ◉ Increase receptive field with same kernel size in subsequent layers
- ○ Employ unpooling layer
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Increase receptive field with same kernel size in subsequent layers

3) In convolutional autoencoder the middle layers are fully connected because *1 point*

- ◉ This effectively extracts global features
- ○ Convolutional AE is build upon vanilla AE
- ○ Increase speed of operations
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
This effectively extracts global features

4) Which layer should be used in decoder part of Convolutional autoencoder if convolution layer with stride is used in encoder part *1 point*

- ○ Unpooling
- ◉ Deconvolution
- ○ Bilinear Interpolation
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Deconvolution

5) What is the architectural difference between VGG and Alexnet *1 point*

- ◉ VGG has single feature extraction stream and Alexnet has two
- ○ Deconvolution
- ○ Bilinear interpolation

- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
VGG has single feature extraction stream and Alexnet has two

6) Which of the architecture has most number of layers and parameters **1 point**

- (•) VGG Net
- ( ) Alex Net
- ( ) LeNet
- ( ) All have same number of parameters

Yes, the answer is correct.
Score: 1

Accepted Answers:
VGG Net

7) Local response normalization is employed to **1 point**

- ( ) Increase the local maxima response and subdue the neighboring responses
- (•) Augment activation performance
- ( ) Sparsify gradients
- ( ) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Increase the local maxima response and subdue the neighboring responses

8) If CNN filters (no bias) of size 3×3 are employed for transforming an image with 3 channels into 64 responses. How many weights need to be learned **1 point**

- ( ) 1378
- (•) 1728
- ( ) 1738
- ( ) 2000

Yes, the answer is correct.
Score: 1

Accepted Answers:
1728

9) If max pooling kernels of size 3×3 are employed for transforming an image with 3 channels into 3 responses. How many weights need to be learned **1 point**

- ( ) 27
- ( ) 18
- ( ) 9
- (•) 0

Yes, the answer is correct.
Score: 1

Accepted Answers:
0

10) Local response normalization is performed **1 point**

- ( ) Mean of the channels
- (•) Across channels
- ( ) Individual channel
- ( ) None

No, the answer is incorrect.
Score: 0

Accepted Answers:
Individual channel

Unit 9 - Week 8

Assignment 8

The due date for submitting this assignment has passed. **Due on 2018-03-21, 23:59 IST.**

Assignment submitted on 2018-03-21, 23:52 IST

1) In inception block the input information is processed through how many parallel channels? *1 point*

- 2
- 3
- 4
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
4

2) In inception block the processed input information is combined using which operation? *1 point*

- Sum
- Multiplication
- Concatenation
- None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Concatenation

3) In inception block, what kernal sizes are employed for convolution? *1 point*

- 1×1
- 2×2
- 3×3
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

4) In inception block, what is the contribution of Maxpooling? *1 point*

- To extract features at multiple scales
- To reduce compute complexity
- To dilate the reponse values
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
To dilate the reponse values

5) The idea for residual layer has originated from training _____ layers effectively. *1 point*

- Initial
- Final
- Both
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Initial

6) The mathematical equivalence of skip connection in residual block is **1 point**

- ○ Identity matrix
- ◉ Summation
- ○ Convolution
- ○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Identity matrix

7) In which case does the loss saturates with less epochs for deeper networks **1 point**

- ○ Network with residual block
- ◉ Network without residual block
- ○ It is subjective
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Network without residual block

8) Which network needs less amount of memory for equal performance **1 point**

- ○ Densenet
- ◉ Residual net
- ○ VGG net
- ○ All are same

No, the answer is incorrect.
Score: 0

Accepted Answers:
Densenet

9) In densenet the information of current is passed on to **1 point**

- ○ Subsequent layer
- ○ Subsequent layers
- ◉ User defined
- ○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Subsequent layers

10) In densenet such passed on information is **1 point**

- ○ Summed
- ◉ Concatenated
- ○ Multiplied
- ○ None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Concatenated

Unit 10 - Week 9

Assignment 9

The due date for submitting this assignment has passed. **Due on 2018-03-28, 23:59 IST.**

Assignment submitted on 2018-03-28, 23:56 IST

1) What is the space complexity of a fully connected layer (double precision floating with bias) with 100 input neurons and 10 output neurons? *1 point*

- ~8 KB
- (•) ~64 KB
- ~32 KB
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
~8 KB

2) What is the operational complexity of a fully connected layer (double precision floating with bias) with 100 input neurons and 10 output neurons? *1 point*

- ~189 Kb
- ~17 KB
- (•) ~138 Kb
- ~20 KB

No, the answer is incorrect.
Score: 0

Accepted Answers:
~17 KB

3) What is the space complexity of a CNN block (double precision floating with bias) with 10 kernels each with channels, height and width being 3, 5 and 5 respectively? *1 point*

- (•) ~47 KB
- ~46.8 Kb
- ~6 KB
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
~6 KB

4) What is the operational complexity of a CNN block (double precision floating with bias) with 10 kernels each with channels, height and width being 3, 5 and 5 respectively? *1 point*

- (•) ~47 Mb
- ~17 MB
- ~ 46.8 Mb
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of the above

5) Data batch size is determined by? *1 point*

- Model Size
- RAM Size
- Hard Drive Size
- (•) Both Model and RAM Size

Yes, the answer is correct.

Score: 1

Accepted Answers:
Both Model and RAM Size

6) Which of the following are placed on RAM during training? ***1 point***

- ○ Model parameters
- ○ Model gradients
- ○ Partial data
- ◉ All of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
All of the above

7) Which transform is used to accelerate the compute? ***1 point***

- ○ Fourier
- ○ Hilbert
- ○ PCA
- ◉ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Fourier

8) What technique is employed to introduce domain adaptation in stacked autoencoder? ***1 point***

- ○ Systematic dropout
- ○ Conditional dictionary learning
- ◉ Feature sampling
- ○ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Systematic dropout

9) What conditions are required for employing domain adaptation ***1 point***

- ○ Existence of common domain
- ◉ Ample amount of labelled data in source domain
- ○ Ample amount of labelled data in target domain
- ○ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Existence of common domain

10) Domain adaptation has application towards ***1 point***

- ○ Semantic segmentation
- ◉ Object localization
- ○ Image classification
- ○ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

Unit 11 - Week 10

Assignment 10

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-04-04, 23:59 IST.

1) What is the input to region proposal network (rpn) ? *1 point*

- RGB images
- Object Responses
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
RGB images

2) What is the output of rpn ? *1 point*

- Probability of the object class
- Bounding box parameters of the object
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both of the above

3) Which losses govern the rpn ? *1 point*

- Classification loss
- Regression loss
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both of the above

4) What kind of classifier is employed in rpn ? *1 point*

- One class
- Two class
- Multi class
- No classifier is employed

No, the answer is incorrect.
Score: 0

Accepted Answers:
Multi class

5) Multiple anchor boxes are generated by changing *1 point*

- Aspect ratio
- Scale
- Centre
- Both aspect ratio and scale

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both aspect ratio and scale

6) Which of the following results in multi scale feature extraction *1 point*

- Multiple filter sizes
- Multiple versions of rescaled input image
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both of the above

7) rpn fails in case of *1 point*

- overlapping objects from different class
- overlapping objects from same class
- overlapping objects
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of the above

8) Can an object classifier trained on image patches can propose regions on a canvas image *1 point*

- Yes
- No
- yes as long as input statistics stay the same
- None

No, the answer is incorrect.
Score: 0

Accepted Answers:
yes as long as input statistics stay the same

9) How many outputs are predicted for a rpn with k anchor boxes *1 point*

- 2k
- 4k
- 6k
- None

No, the answer is incorrect.
Score: 0

Accepted Answers:
6k

10) What is the dimension of the vector based on which the above outputs are generated *1 point*

- 256
- 128
- Subjective to anchor boxes number
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
256

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Unit 12 - Week 11

Assignment 11

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-04-11, 23:59 IST.

1) What is the role of decoder in adversarial autoencoder? *1 point*

- Generate the images for given latent space information
- For reducing MSE loss
- For constructing better latent space
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Generate the images for given latent space information

2) What could be a solution for generative model training *1 point*

- By appending an auxiliary branch to distinguish between fake and real images
- Be reducing number of parameters in the model
- Data augmentation through various morphological transformations
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
By appending an auxiliary branch to distinguish between fake and real images

3) What is the property of a well trained generative model *1 point*

- It can clearly distinguish between fake and real images
- Given a set of images it can generated a good latent space
- Given a a random noise the model is capable of generating realistic images
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Given a a random noise the model is capable of generating realistic images

4) Which of the following is true for adversarial autoencoder *1 point*

- The information tapped out from decoder input is used to classify real or fake samples
- The information sampled from Gaussian distribution is used to classify real or fake samples
- Both a and b
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both a and b

5) Which of the following is true for adversarial autoencoder (AAE) *1 point*

- It is supervised framework as a classifier is used for distinguishing positive and negative samples
- It is unsupervised framework
- The sampling space should be Gaussian
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
It is unsupervised framework

6) What is the distinction between AAE and AAE with regularization *1 point*

- Inclusion of class label during classification of positive or negative samples
- Inclusion of class label during reconstruction of real sample
- Removal of classification
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Inclusion of class label during classification of positive or negative samples

7) What is true for Supervised AAE *1 point*

- Inclusion of class label during classification of positive or negative samples
- Inclusion of class label during reconstruction of real sample
- Removal of classification
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Inclusion of class label during reconstruction of real sample

8) In the code snippet given what is the encoder? *1 point*

```
class Q_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(Q_net, self).__init__()
        self.lin3gauss = nn.Linear(X_dim, z_dim)
    def forward(self, x):
        return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(P_net, self).__init__()
        self.lin1 = nn.Linear(z_dim,X_dim)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.25, training=self.training)
        return F.sigmoid(x)
class D_net_gauss(nn.Module):
    def __init__(self,N,z_dim):
        super(D_net_gauss, self).__init__()
        self.lin1 = nn.Linear(z_dim, N)
        self.lin3 = nn.Linear(N, 1)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.2, training=self.training)
        x = F.relu(x)
        return F.sigmoid(self.lin3(x))
```

- Q_net
- P_net
- D_net_gauss
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Q_net

9) In the code snippet given what is the decoder? *1 point*

```
class Q_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(Q_net, self).__init__()
        self.lin3gauss = nn.Linear(X_dim, z_dim)
    def forward(self, x):
        return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(P_net, self).__init__()
        self.lin1 = nn.Linear(z_dim,X_dim)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.25, training=self.training)
        return F.sigmoid(x)
class D_net_gauss(nn.Module):
    def __init__(self,N,z_dim):
        super(D_net_gauss, self).__init__()
        self.lin1 = nn.Linear(z_dim, N)
        self.lin3 = nn.Linear(N, 1)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.2, training=self.training)
        x = F.relu(x)
        return F.sigmoid(self.lin3(x))
```

- Q_net
- P_net
- D_net_gauss
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
P_net

10) In the code snippet given what is the classifier? ***1 point***


```
class Q_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(Q_net, self).__init__()
        self.lin3gauss = nn.Linear(X_dim, z_dim)
    def forward(self, x):
        return xgauss
class P_net(nn.Module):
    def __init__(self,X_dim,N,z_dim):
        super(P_net, self).__init__()
        self.lin1 = nn.Linear(z_dim,X_dim)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.25, training=self.training)
        return F.sigmoid(x)
class D_net_gauss(nn.Module):
    def __init__(self,N,z_dim):
        super(D_net_gauss, self).__init__()
        self.lin1 = nn.Linear(z_dim, N)
        self.lin3 = nn.Linear(N, 1)
    def forward(self, x):
        x = F.dropout(self.lin1(x), p=0.2, training=self.training)
        x = F.relu(x)
        return F.sigmoid(self.lin3(x))
```

- Q_net
- P_net
- D_net_gauss
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
D_net_gauss

Unit 13 - Week 12

Assignment 12

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-04-18, 23:59 IST.

1) Which of the following topology is true for RNN? *1 point*

- Many to one
- Many to many
- One to many
- Any of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Any of the above

2) Which of the following parameters are needed for RNN in addition to input transformation weights $(W_{h,x,t})$ *1 point*

- $W_{h,h,t}$
- h_{t-1}
- Both a and b
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both a and b

3) Which of the following gates are used in LSTM? *1 point*

- Input
- Forget
- Output
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

4) Given a sequence of T color images of size 224 x 224, how are they organized for tensor processing ? *1 point*

- 3 x T x 224 x 224
- T x 3 x 224 x 224
- 3 x T x M x M
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
3 x T x 224 x 224

5) Given a sequence of 100 color images of size 224 x 224 and kernel of size 3, no padding, 18 channels and single stride. What is the convolution output *1 point*

- 18 x 100 x 222 x 222
- 18 x 98 x 222 x 222
- 18 x 98 x 224 x 224
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
18 x 98 x 222 x 222

6) For temporal learning which architecture is most preferable **1 point**

- Autoencoder
- LSTM
- CNN
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
LSTM

7) Which of the following hurdles of RNN were overcomed by LSTM **1 point**

- Learning long term dependencies
- Exponential decay of learning rate along time
- Both a and b
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both a and b

8) Which of the following commands create a LSTM with input dimension as 3 and output dimension as 3 through nn module **1 point**

- nn.LSTM(3, 3)
- nn.GRU(3, 3).LSTM
- nn.RNN(3, 3).LSTM
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
nn.LSTM(3, 3)

9) How many variables are generated upon feed forwarding LSTM for 5 step **1 point**

- output variables
- output and hidden variables
- output, hidden and input storage variable
- None

No, the answer is incorrect.
Score: 0

Accepted Answers:
output, hidden and input storage variable

10) How many variables are fed for lstm **1 point**

- Input
- Input and previous hidden state
- Input, previous hidden and previous output
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Input and previous hidden state