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


## Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

week 4

Week 5

Week 6

Week 7

Week 8

- ☐ A quick recap of training deep neural networks (unit? unit=106&lesson=107)

# Assignment 8

The due date for submitting this assignment has passed.

Due on 2021-03-17, 23:59 IST.

Assignment submitted on 2021-03-17, 22:57 IST

 1) The learning algorithm used to train a deep and wide Neural Networks is **1 point**

- ☐ Gradient Descent
- ☐ Gradient Descent and chain rule
- ☒ Back Propagation
- ☐ Mini-Batch Gradient

Yes, the answer is correct.

Score: 1

Accepted Answers:

Back Propagation

 2) The gradient with respect to a parameter is proportional to the input to the parameter. **1 point**

- ☒ True
- ☐ False

Yes, the answer is correct.

Score: 1

Accepted Answers:

True

 3)  $S_1$  and  $S_2$  are two statements related to Back Propagation. **1 point**

☐ Unsupervised pre-training (unit? unit=106&lesson=108)

☐ Better activation functions (unit? unit=106&lesson=109)

☐ Better initialization strategies (unit? unit=106&lesson=110)

☐ Batch Normalization (unit? unit=106&lesson=111)

☒ Lecture Material for Week 8 (unit? unit=106&lesson=112)

☒ Quiz: Assignment 8 (assessment? name=186)

☐ Week 8 Feedback Form : Deep Learning - IIT Ropar (unit? unit=106&lesson=113)

## Week 9

☐ One-hot representations of words (unit? unit=114&lesson=115)

☐ Distributed Representations of words (unit? unit=114&lesson=116)

☐ SVD for learning word representations (unit? unit=114&lesson=117)

☐ SVD for learning word representations

S<sub>1</sub>. Even after a large number of epochs the training might not converge.

S<sub>2</sub>. When used for really deep networks it may not be very successful.

Choose the correct answer:

- ☐ S<sub>1</sub> is true and S<sub>2</sub> is false.  
☐ S<sub>1</sub> is false and S<sub>2</sub> is true.  
☒ Both S<sub>1</sub> and S<sub>2</sub> are true.  
☐ Both S<sub>1</sub> and S<sub>2</sub> are false.

Yes, the answer is correct.

Score: 1

Accepted Answers:

*Both S<sub>1</sub> and S<sub>2</sub> are true.*

4) The process of taking input(x) feeding it to the transformation hidden representation(h1) trying to reconstruct x from h1 is known as

**1 point**

- ☐ Mini-Batch Gradient  
☒ Back propagation  
☐ Order Encoding  
☐ None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

*Order Encoding*

5) S<sub>1</sub> and S<sub>2</sub> are two statements related to Universal Approximation Theorem

**1 point**

S<sub>1</sub>: The error surface of the supervised objective of a Deep Neural Network is highly non-convex.

S<sub>2</sub>: The large capacity of Deep Neural Network is still easy to land in one of the 0 error region.

Choose the correct option with respect to S<sub>1</sub> and S<sub>2</sub>.

- ☐ S<sub>1</sub> is true and S<sub>2</sub> is false.  
☐ S<sub>1</sub> is false and S<sub>2</sub> is true.  
☒ Both S<sub>1</sub> and S<sub>2</sub> are true.  
☐ Both S<sub>1</sub> and S<sub>2</sub> are false.

Yes, the answer is correct.

Score: 1

Accepted Answers:

*Both S<sub>1</sub> and S<sub>2</sub> are true.*

6) The error surface of the supervised objective of a Deep Neural Network is \_\_\_\_\_

**1 point**

- ☐ Highly Convex.  
☒ Highly Non-Convex.  
☐ Slightly Convex.

(Contd.) (unit?  
unit=114&lesson=118)

☐ Continuous bag  
of words model  
(unit?  
unit=114&lesson=119)

☐ Skip-gram  
model (unit?  
unit=114&lesson=120)

☐ Skip-gram  
model (Contd.)  
(unit?  
unit=114&lesson=121)

☐ Contrastive  
estimation  
(unit?  
unit=114&lesson=122)

☐ Hierarchical  
softmax (unit?  
unit=114&lesson=123)

☐ GloVe  
representations  
(unit?  
unit=114&lesson=124)

☐ Evaluating  
word  
representations  
(unit?  
unit=114&lesson=125)

☐ Relation  
between SVD  
and Word2Vec  
(unit?  
unit=114&lesson=126)

☒ Lecture  
Material for  
Week 9 (unit?  
unit=114&lesson=127)

☒ Quiz:  
Assignment 9  
(assessment?  
name=187)

☐ Week 9  
Feedback Form  
: Deep  
Learning - IIT  
Ropar (unit?  
unit=114&lesson=128)

☐ None of these.

Yes, the answer is correct.  
Score: 1

Accepted Answers:  
*Highly Non-Convex.*

7) A Sigmoid neuron is said to have saturated value when

**1 point**

- ☐  $\sigma(x)=0$   
☐  $\sigma(x)=1$   
☒ Both a and b  
☐ None of these

Yes, the answer is correct.  
Score: 1

Accepted Answers:  
*Both a and b*

8) A large function of ReLU units can die, if the learning rate is set too high.

**1 point**

- ☒ True  
☐ False

Yes, the answer is correct.  
Score: 1

Accepted Answers:  
*True*

9)  $S_1$  and  $S_2$  are two statements related to Leaky ReLU gradient, choose the correct option.

**1 point**

$S_1$ : No Saturation and close to zero centroid outputs.

$S_2$ : Will not die and is computational efficient.

- ☐  $S_1$  is true and  $S_2$  is false.  
☐  $S_1$  is false and  $S_2$  is true.  
☒ Both  $S_1$  and  $S_2$  are true.  
☐ Both  $S_1$  and  $S_2$  are false.

Yes, the answer is correct.  
Score: 1

Accepted Answers:  
*Both  $S_1$  and  $S_2$  are true.*

10)  $S_1$  and  $S_2$  are two statements related to Convolutional Neural Networks, Choose the correct option.

**1 point**

$S_1$ : Sigmoids are bad for Convolutional Neural Networks.

$S_2$ : ReLU is more or less the standard unit for Convolutional Neural Networks.

- ☐  $S_1$  is true and  $S_2$  is false.

**week 10**

- ☐ The convolution operation (unit? unit=129&lesson=130)
- ☐ Relation between input size, output size and filter size (unit? unit=129&lesson=131)
- ☐ Convolutional Neural Networks (unit? unit=129&lesson=132)
- ☐ Convolutional Neural Networks (Contd.) (unit? unit=129&lesson=133)
- ☐ CNNs (success stories on ImageNet) (unit? unit=129&lesson=134)
- ☐ CNNs (success stories on ImageNet) (Contd.) (unit? unit=129&lesson=135)
- ☐ Image Classification continued (GoogLeNet and ResNet) (unit? unit=129&lesson=136)
- ☐ Visualizing patches which maximally activate a neuron (unit? unit=129&lesson=137)
- ☐ Visualizing filters of a CNN (unit? unit=129&lesson=138)
- ☐ Occlusion experiments

- ☐  $S_1$  is false and  $S_2$  is true.
- ☒ Both  $S_1$  and  $S_2$  are true.
- ☐ Both  $S_1$  and  $S_2$  are false.

Yes, the answer is correct.

Score: 1

Accepted Answers:

*Both  $S_1$  and  $S_2$  are true.*

(unit?  
unit=129&lesson=139)

☐ Finding  
influence of  
input pixels  
using  
backpropagation  
(unit?  
unit=129&lesson=140)

☐ Guided  
Backpropagation  
(unit?  
unit=129&lesson=141)

☐ Optimization  
over images  
(unit?  
unit=129&lesson=142)

☐ Create images  
from  
embeddings  
(unit?  
unit=129&lesson=143)

☐ Deep Dream  
(unit?  
unit=129&lesson=144)

☐ Deep Art (unit?  
unit=129&lesson=145)

☐ Fooling Deep  
Convolutional  
Neural  
Networks (unit?  
unit=129&lesson=146)

☒ Lecture  
Material for  
Week 10 (unit?  
unit=129&lesson=147)

☒ Quiz:  
Assignment 10  
(assessment?  
name=188)

☐ Week 10  
Feedback Form  
: Deep  
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Ropar (unit?  
unit=129&lesson=148)

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## Week 11

- ☒ Sequence Learning Problems (unit? unit=149&lesson=150)
- ☒ Recurrent Neural Networks (unit? unit=149&lesson=151)
- ☐ Backpropagation through time (unit? unit=149&lesson=152)
- ☐ The problem of Exploding and Vanishing Gradients (unit? unit=149&lesson=153)
- ☐ Some Gory Details (unit? unit=149&lesson=154)
- ☐ Selective Read, Selective Write, Selective Forget - The Whiteboard Analogy (unit? unit=149&lesson=155)
- ☐ Long Short Term Memory(LSTM) and Gated Recurrent Units(GRUs) (unit? unit=149&lesson=156)
- ☐ How LSTMs avoid the problem of vanishing gradients (unit? unit=149&lesson=157)
- ☐ How LSTMs avoid the problem of vanishing gradients (Contd.) (unit? unit=149&lesson=158)

- Lecture  
Material for  
Week 11 (unit?  
unit=149&lesson=159)
- Quiz:  
Assignment 11  
(assessment?  
name=189)
- Week 11  
Feedback Form  
: Deep  
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Ropar (unit?  
unit=149&lesson=160)

## Week 12

- Introduction to  
Encoder  
Decoder  
Models (unit?  
unit=161&lesson=162)
- Applications of  
Encoder  
Decoder  
models (unit?  
unit=161&lesson=163)
- Attention  
Mechanism  
(unit?  
unit=161&lesson=164)
- Attention  
Mechanism  
(Contd.) (unit?  
unit=161&lesson=165)
- Attention over  
images (unit?  
unit=161&lesson=166)
- Hierarchical  
Attention (unit?  
unit=161&lesson=167)
- Lecture  
Material for  
Week 12 (unit?  
unit=161&lesson=168)
- Quiz:  
Assignment 12  
(assessment?  
name=190)

☐ Week 12  
Feedback Form  
: Deep  
Learning - IIT  
Ropar (unit?  
unit=161&lesson=169)

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