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

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Course outline

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Week 11: Assignment 11

The due date for submitting this assignment has passed.
Due on 2025-04-09, 23:59 IST.

Assignment submitted on 2025-04-08, 17:56 IST

1) For which of the following problems are RNNs suitable?   **1 point**

☑ Generating a description from a given image.

☑ Forecasting the weather for the next N days based on historical weather data.

☑ Converting a speech waveform into text.

☐ Identifying all objects in a given image.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Generating a description from a given image.
Forecasting the weather for the next N days based on historical weather data.
Converting a speech waveform into text.

2) Suppose that we need to develop an RNN model for sentiment classification. The input to the model is a sentence composed of five words and the output is the sentiments (positive or negative). Assume that each word is represented as a vector of length 100×1 and the output labels are one-hot encoded. Further, the state vector s_t is initialized with all zeros of size 30×1. How many parameters (including bias) are there in the network?

4050	⌄

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 3992

1 point

3) Select the correct statements about GRUs   *1 point*

☑ GRUs have fewer parameters compared to LSTMs

☑ GRUs use a single gate to control both input and forget mechanisms

☐ GRUs are less effective than LSTMs in handling long-term dependencies

☐ GRUs are a type of feedforward neural network

Yes, the answer is correct.
Score: 1

Accepted Answers:
GRUs have fewer parameters compared to LSTMs
GRUs use a single gate to control both input and forget mechanisms

4) What is the main advantage of using GRUs over traditional RNNs?   *1 point*

◯ They are simpler to implement

◉ They solve the vanishing gradient problem

◯ They require less computational power

◯ They can handle non-sequential data

Yes, the answer is correct.
Score: 1

Accepted Answers:
They solve the vanishing gradient problem

5) The statement that LSTM and GRU solves both the problem of vanishing and exploding gradients in RNN is   *1 point*

◯ True

◉ False

Yes, the answer is correct.
Score: 1

Accepted Answers:
False

6) What is the vanishing gradient problem in training RNNs?   *1 point*

◯ The weights of the network converge to zero during training

◯ The gradients used for weight updates become too large

◯ The network becomes overfit to the training data

◉ The gradients used for weight updates become too small

Yes, the answer is correct.
Score: 1

Accepted Answers:
The gradients used for weight updates become too small

7) What is the role of the forget gate in an LSTM network?   *1 point*

◯ To determine how much of the current input should be added to the cell state.

◉ To determine how much of the previous time step's cell state should be retained.

◯ To determine how much of the current cell state should be output.

◯ To determine how much of the current input should be output.

Yes, the answer is correct.
Score: 1

Accepted Answers:
To determine how much of the previous time step's cell state should be retained.

8) How does LSTM prevent the problem of vanishing gradients?   *1 point*

- ○ Different activation functions, such as ReLU, are used instead of sigmoid in LSTM.

- ○ Gradients are normalized during backpropagation.

- ○ The learning rate is increased in LSTM.

- ◉ Forget gates regulate the flow of gradients during backpropagation.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Forget gates regulate the flow of gradients during backpropagation.

9) We are given an RNN with $||W|| = 2.5$. The activation function used in the RNN is *1 point* logistic. What can we say about $\nabla = \left\| \frac{\partial s_{20}}{\partial s_1} \right\|$

- ○ Value of ∇ is very high.

- ◉ Value of ∇ is close to 0

- ○ Value of ∇ is 2.5

- ○ Insufficient information to say anything.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Value of ∇ is close to 0

10) Select the true statements about BPTT?   *1 point*

- ☑ The gradients of Loss with respect to parameters are added across time steps

- ☐ The gradients of Loss with respect to parameters are subtracted across time steps

- ☐ The gradient may vanish or explode, in general,if timesteps are too large

- ☑ The gradient may vanish or explode if timesteps are too small

No, the answer is incorrect.
Score: 0

Accepted Answers:
The gradients of Loss with respect to parameters are added across time steps
The gradient may vanish or explode, in general,if timesteps are too large

11: Assignment 11 (assessment?name=321)

Week 12 ()

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