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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Edge Computing (course)

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Course outline

About NPTEL ()

How does an NPTEL online course work? ()

Week 0 ()

Week 1: Cloud and Edge Computing ()

Week 2 : Edge Computing ()

Week 4: Assignment 4

The due date for submitting this assignment has passed.

Due on 2025-02-19, 23:59 IST.

Assignment submitted on 2025-02-18, 10:22 IST

1) Which algorithm is used to aggregate models in Federated Learning?   **1 point**

○ Backpropagation
◉ FedAvg
○ K-means
○ Principal Component Analysis

Yes, the answer is correct.
Score: 1

Accepted Answers:
FedAvg

2) What is one major advantage of Federated Learning for IoT devices?   **1 point**

○ Reduced hardware requirements
○ Simplified data preprocessing
◉ Data privacy and decentralized training
○ Increased computational speed

Yes, the answer is correct.
Score: 1

Accepted Answers:
Data privacy and decentralized training

3) In knowledge distillation, which loss function is used to transfer knowledge from teacher to student?   **1 point**

○ Mean Squared Error (MSE)

○ Hinge Loss

○ Cross-Entropy

◉ KL Divergence

Yes, the answer is correct.
Score: 1

Accepted Answers:
KL Divergence

4) What is the primary challenge of non-IID (independent and identically distributed) **1 point**
data in FL?

○ Data leakage

○ Higher computational costs

◉ Slower convergence of the model

○ Model overfitting

Yes, the answer is correct.
Score: 1

Accepted Answers:
Slower convergence of the model

5) What is the primary benefit of low-rank factorization in deep learning model **1 point**
optimization?

◉ Reduces model size and computation costs

○ Increases model accuracy

○ Improves training speed

○ Enhances data privacy

Yes, the answer is correct.
Score: 1

Accepted Answers:
Reduces model size and computation costs

6) In Federated Learning, if a cluster has 4 devices and each device achieves an **1 point**
accuracy of 80%, what is the average accuracy
of the aggregated model?

○ 20%

○ 40%

○ 100%

◉ 80%

Yes, the answer is correct.
Score: 1

Accepted Answers:
80%

7) What is a critical privacy concern in Federated Learning? **1 point**

◉ Membership inference attacks

○ Model convergence speed

○ Computational power

○ Network bandwidth

Yes, the answer is correct.
Score: 1

Accepted Answers:
Membership inference attacks

8) A Federated Learning model sends updates to the central server every 5 seconds. **1 point**
How many updates are sent in 1 minute?

○ 10

◉ 12

○ 15

○ 20

Yes, the answer is correct.
Score: 1

Accepted Answers:
12

9) In Knowledge Distillation, which of the following is considered the "teacher"? **1 point**

○ A smaller, simplified model

○ The dataset used for training

◉ A large, pre-trained model

○ The optimizer used during training

Yes, the answer is correct.
Score: 1

Accepted Answers:
A large, pre-trained model

10) What challenge in Federated Learning does the term "non-IID data" refer to? **1 point**

○ High bandwidth usage during model training

◉ Data being unevenly distributed and diverse across devices

○ Lack of encryption for sensitive data

○ Overfitting due to excessive training

Yes, the answer is correct.
Score: 1

Accepted Answers:
Data being unevenly distributed and diverse across devices