Multiple Choice Questions for Lecture 6: Deep Learning and Computer Vision

Basic Concepts Review

1. Which of the following best describes Artificial Intelligence?

   - A) The ability of computers to perform calculations quickly
   - B) The ability of computers to perform tasks that normally require human intelligence
   - C) The ability of computers to connect to the internet
   - D) The ability of computers to store large amounts of data

   Answer: B) The ability of computers to perform tasks that normally require human intelligence

2. What is machine learning?

   - A) When computers learn from data without being explicitly programmed
   - B) When computers follow exact instructions given by programmers
   - C) When computers teach humans new skills
   - D) When computers calculate mathematical equations

   Answer: A) When computers learn from data without being explicitly programmed

Deep Learning Basics

3. What is deep learning?

   - A) Learning that happens deep underwater
   - B) Learning about deep space
   - C) A branch of machine learning using neural networks with many layers
   -

D) Learning that takes a very long time

Answer: C) A branch of machine learning using neural networks with many layers

4. What is a key difference between traditional machine learning and deep learning?

   – A) Traditional machine learning is newer than deep learning

   – B) Traditional machine learning often requires manual feature extraction; deep learning can discover features automatically

   – C) Deep learning doesn't use data; traditional machine learning does

   – D) Traditional machine learning is only used for images; deep learning is used for text

   Answer: B) Traditional machine learning often requires manual feature extraction; deep learning can discover features automatically

5. What does the term "depth" refer to in deep learning?

   – A) The difficulty of the problems it solves

   – B) How deeply it understands concepts

   – C) The number of layers in the neural network

   – D) The depth of knowledge of the programmer

   Answer: C) The number of layers in the neural network

6. What is representation learning in the context of deep learning?

   – A) Learning how to represent yourself in social situations

   – B) The ability of a machine to automatically discover important features from raw data

   – C) Learning how to draw representations of objects

   – D) A way to represent problems in mathematical form

   Answer: B) The ability of a machine to automatically discover important features from raw data

Neural Networks

7. What inspired the design of neural networks?

   – A) Computer circuits
   – B) The human brain
   – C) Electrical grids
   – D) Traffic networks

   Answer: B) The human brain

8. Which of these is NOT a type of neural network mentioned in the lecture?

   – A) Convolutional Neural Networks (CNN)
   – B) Recurrent Neural Networks (RNN)
   – C) Diagonal Neural Networks (DNN)
   – D) Feedforward Neural Networks

   Answer: C) Diagonal Neural Networks (DNN)

9. What are the main parts of a standard neural network?

   – A) Input layer, hidden layers, output layer
   – B) Start, middle, end
   – C) Top, bottom, sides
   – D) Data, algorithm, result

   Answer: A) Input layer, hidden layers, output layer

10. What is a perceptron?

    – A) A type of camera used in computer vision
    – B) A neural network without any hidden layers
    –

C) A special type of deep learning algorithm

D) The person who creates a neural network

Answer: B) A neural network without any hidden layers

11. During which phase of neural network learning are the weights adjusted?

A) The feedforward phase

B) The backpropagation phase

C) The input phase

D) The testing phase

Answer: B) The backpropagation phase

Convolutional Neural Networks (CNNs)

12. What are Convolutional Neural Networks (CNNs) especially designed for?

A) Text processing

B) Audio processing

C) Image processing

D) Financial data

Answer: C) Image processing

13. Which of these is NOT a main component of a CNN?

A) Convolutional layer

B) Pooling layer

C) Fully connected layer

D) Grammar layer

Answer: D) Grammar layer

14. What is the purpose of pooling layers in a CNN?

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A) To add more features to the image
–
B) To reduce image size while keeping important information
–
C) To add color to black and white images
–
D) To connect to other neural networks

Answer: B) To reduce image size while keeping important information

15. What makes CNNs particularly efficient for image processing?

–
A) They can process images faster than humans
–
B) They use parameter sharing (same filter across the image)
–
C) They can work with any size of image
–
D) They don't require any training

Answer: B) They use parameter sharing (same filter across the image)

Computer Vision

16. What is computer vision?

–
A) A type of eyeglasses for computers
–
B) Teaching computers to understand images and videos like humans do
–
C) The ability of computers to predict the future
–
D) A way for computers to improve their screen resolution

Answer: B) Teaching computers to understand images and videos like humans do

17. What is the difference between passive and active sensing in computer vision?

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A) Passive sensing uses electricity; active sensing doesn't
–
B) Passive sensing captures existing light; active sensing sends out signals
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C) Passive sensing is old technology; active sensing is new

– D) Passive sensing is manual; active sensing is automatic

Answer: B) Passive sensing captures existing light; active sensing sends out signals

18. How does a computer "see" an image of a cat compared to how humans see it?

– A) The computer sees a cute pet; humans see a grid of pixels

– B) The computer sees a grid of numbers; humans see a furry animal

– C) The computer sees in black and white; humans see in color

– D) Both see exactly the same thing

Answer: B) The computer sees a grid of numbers; humans see a furry animal

19. Which of these is NOT a real-world application of computer vision mentioned in the lecture?

– A) OCR (converting handwritten text to digital)

– B) Face detection

– C) Weather prediction

– D) Self-driving cars

Answer: C) Weather prediction

20. What are the two core problems in computer vision mentioned in the lecture?

– A) Recognition and detection

– B) Reconstruction and recognition

– C) Resolution and color

– D) Brightness and contrast

Answer: B) Reconstruction and recognition