UNIVERSITY OF PETRA

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Course management ⚙

خ 2   202120386 خوله اشرف حسن محمد DS&AI

Started on	Tuesday, 6 May 2025, 12:12 PM
Started on	Tuesday, 6 May 2025, 12:12 PM
State	Finished
Completed on	Tuesday, 6 May 2025, 12:47 PM
Time taken	35 mins 53 secs
Marks	22.00/32.00
Grade	**20.63** out of 30.00 (**68.75**%)

Question 1

Correct

Mark 1.00 out of 1.00

Q13. Histogram of Oriented Gradients (HOG) feature extraction is useful for

- ○ a.   Thresholding image intensities
- ◉ b.   Capturing edge direction and magnitude for classification ✓
- ○ c.   Texture synthesis
- ○ d.   Blurring large objects

The correct answer is: Capturing edge direction and magnitude for classification

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:12:48	Saved: Capturing edge direction and magnitude for classification	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **2**

Incorrect

Mark 0.00 out of 1.00

Hide sidebars

Q1. Reading an image in grayscale using OpenCV results in

- ○ a.   A single matrix with 8-bit depth per pixel
- ○ b.   A multi-channel RGB image
- ◉ c.   An image with inverted pixel values ✗
- ○ d.   A thresholded binary image

The correct answer is: A single matrix with 8-bit depth per pixel

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:13:49	Saved: An image with inverted pixel values	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question 3

Correct

Mark 1.00 out of 1.00

Q6. Pooling layers in CNNs are used to

○ a.   Replace convolution layers in shallow models

○ b.   Increase the number of filters at each level

◉ c.   Reduce dimensionality while retaining key features ✓

○ d.   Normalize data for better color contrast

The correct answer is: Reduce dimensionality while retaining key features

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:14:12	Saved: Reduce dimensionality while retaining key features	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 4

Incorrect

Mark 0.00 out of 1.00

Q16. The speed advantage of Faster R-CNN arises because

- ○ a.   It filters regions using PCA
- ○ b.   Convolution is done once and reused across tasks
- ⦿ c.   It removes fully connected layers from detection heads ✗
- ○ d.   It uses binary SVMs instead of softmax

The correct answer is: Convolution is done once and reused across tasks

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:15:40	Saved: It removes fully connected layers from detection heads	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question 5

Incorrect

Mark 0.00 out of 1.00

Q6. The `cv2.Canny()` function outputs

- ○ a. A single RGB matrix
- ⦿ b. Color contours of gradient direction ✕
- ○ c. A binary edge map
- ○ d. A histogram of pixel differences

The correct answer is: A binary edge map

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:16:17	Saved: A binary edge map	Answer saved	
3	6/05/25, 12:45:58	Saved: Color contours of gradient direction	Answer saved	
4	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question 6

Correct

Mark 1.00 out of 1.00

Q14. Filters in CNNs are learned using

- ○ a. Gaussian mixture models
- ○ b. Principal component analysis
- ⦿ c. Gradient descent and backpropagation over convolutional layers ✓
- ○ d. Histogram equalization

The correct answer is: Gradient descent and backpropagation over convolutional layers

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Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:16:44	Saved: Gradient descent and backpropagation over convolutional layers	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 7

Correct

Mark 1.00 out of
1.00

Q3. Digital image representation stores pixel intensities

○ a. In floating point arrays between -1 and 1

○ b. As RGB hex codes for compression

○ c. Using Fourier basis functions

◉ d. In discrete grid positions with intensity values ✓

The correct answer is: In discrete grid positions with intensity values

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:17:30	Saved: In discrete grid positions with intensity values	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **8**

Correct

Mark 1.00 out of 1.00

Q12. Biometrics often depends on

- ○ a.   Unique physical traits such as fingerprints or iris patterns ✓
- ○ b.   Eye movement detection in grayscale images
- ○ c.   Compressing facial expressions
- ○ d.   High-resolution signal interpolation

The correct answer is: Unique physical traits such as fingerprints or iris patterns

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:18:01	Saved: Unique physical traits such as fingerprints or iris patterns	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **9**

Correct

Mark 1.00 out of 1.00

Hide sidebars

Q14. Edge linking relies on gradient direction by

- ○ a.   Thresholding only edge magnitude
- ○ b.   Applying PCA to image borders
- ◉ c.   Propagating edge continuation along the gradient normal ✓
- ○ d.   Moving along RGB histograms

The correct answer is: Propagating edge continuation along the gradient normal

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:18:53	Saved: Propagating edge continuation along the gradient normal	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 10

Correct

Mark 1.00 out of
1.00

Hide sidebars

Q11. Object recognition tasks generally involve

- a.   Counting edges per image block
- b.   Identifying and localizing instances of known classes ✓
- c.   Enhancing images using global contrast
- d.   Visualizing optical illusions using filters

The correct answer is: Identifying and localizing instances of known classes

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:19:04	Saved: Identifying and localizing instances of known classes	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **11**

Correct

Mark 1.00 out of 1.00

Q15. A batch size of 64 during training implies

- ○ a. Each epoch uses 64 samples in total
- ○ b. Accuracy is computed after every 64 epochs
- ⦿ c. Weights are updated every 64 gradient calculations ✓
- ○ d. The model trains for only 64 iterations

The correct answer is: Weights are updated every 64 gradient calculations

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:19:54	Saved: Weights are updated every 64 gradient calculations	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 12

Incorrect

Mark 0.00 out of 1.00

Q8. Activation maps in CNNs reflect

- ○ a. Feature matching scores from the output layer
- ○ b. Noise levels in the preprocessing stage
- ○ c. Filter responses across spatial locations
- ⦿ d. Receptive field intensities from raw image blocks ✕

The correct answer is: Filter responses across spatial locations

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:21:34	Saved: Receptive field intensities from raw image blocks	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **13**

Correct

Mark 1.00 out of 1.00

Hide sidebars

Q1. Edge detection in image processing aims to extract

○ a.   RGB values with reduced noise

○ b.   Contours generated from thresholding color

○ c.   Uniform pixel intensity values

● d.   Boundary-like features that encode shape ✓

The correct answer is: Boundary-like features that encode shape

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:23:51	Saved: Boundary-like features that encode shape	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 14

Correct

Mark 1.00 out of 1.00

Q1. Describing interest points using feature vectors helps in

- ○ a. Tracking object deformation over time
- ○ b. Compressing image resolution for lossy storage
- ○ c. Reducing color intensity variation
- ⦿ d. Matching semantically similar regions across images ✓

The correct answer is: Matching semantically similar regions across images

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:25:07	Saved: Matching semantically similar regions across images	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **15**

Correct

Mark 1.00 out of 1.00

Q16. HSV conversion is valuable because it

- ○ a.   Enhances grayscale contrast
- ◉ b.   Removes dependency on intensity values for color recognition ✓
- ○ c.   Applies inverse gamma correction to brightness
- ○ d.   Avoids resizing before filtering

The correct answer is: Removes dependency on intensity values for color recognition

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:25:20	Saved: Removes dependency on intensity values for color recognition	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 16

Incorrect

Mark 0.00 out of 1.00

Q6. Feature detection in the human visual system is functionally analogous to

- ○ a.   Lossless encoding in image formats
- ◉ b.   Thresholding techniques in segmentation ✗
- ○ c.   Convolutional layers in deep networks
- ○ d.   JPEG compression in imaging devices

The correct answer is: Convolutional layers in deep networks

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:26:07	Saved: Thresholding techniques in segmentation	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **17**

Correct

Mark 1.00 out of 1.00

Hide sidebars

Q5. A 5x5x3 filter applied to a 32x32x3 input produces

- a. A 64x64 output using zero padding
- b. 75-dimensional dot product results per location ✓
- c. A 3D output with reduced spatial resolution
- d. A single scalar per input image

The correct answer is: 75-dimensional dot product results per location

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:27:13	Saved: 75-dimensional dot product results per location	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 18

Correct

Mark 1.00 out of 1.00

Q12. CNN deployment often requires model optimization such as

- a. Quantization and pruning ✓
- b. Recursive padding
- c. Histogram balancing
- d. Depth augmentation

The correct answer is: Quantization and pruning

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:27:35	Saved: Quantization and pruning	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **19**

Correct

Mark 1.00 out of 1.00

Q5. Dilation in binary images leads to

- ○ a.   Skewness correction of foreground objects
- ○ b.   Subdivision of connected components
- ○ c.   Intensity normalization across object boundaries
- ⦿ d.   Enlargement of white regions, closing small black holes ✓

The correct answer is: Enlargement of white regions, closing small black holes

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:44:17	Saved: Enlargement of white regions, closing small black holes	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 20

Incorrect

Mark 0.00 out of 1.00

Q11. Threshold ratio in edge hysteresis is typically designed to

○ a.   Balance edge sensitivity and noise tolerance

○ b.   Ensure equal gradient division across axes

○ c.   Eliminate weak pixel structures altogether

◉ d.   Match histogram ranges in smoothed images ✗

The correct answer is: Balance edge sensitivity and noise tolerance

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:31:04	Saved: Match histogram ranges in smoothed images	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **21**

Correct

Mark 1.00 out of 1.00

Q19. A fully connected Dense layer with ReLU activation introduces

- ○ a. Nonlinear transformations after convolution ✓
- ○ b. Spatial invariance across filters
- ○ c. Reduced model depth for faster training
- ○ d. Gradient clipping across pooling regions

The correct answer is: Nonlinear transformations after convolution

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:33:00	Saved: Nonlinear transformations after convolution	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **22**

Incorrect

Mark 0.00 out of 1.00

Q11. The `cv2.cornerHarris()` function requires image conversion to

- ○ a. uint16
- ○ b. float64
- ○ c. float32
- ⊙ d. uint8 ✗

The correct answer is: float32

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:34:51	Saved: uint8	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **23**

Correct

Mark 1.00 out of 1.00

Q17. The `Rectangle` function in matplotlib is used to

○ a.   Annotate noise in grayscale gradients

○ b.   Transform patches into binary

○ c.   Replace edge maps with histograms

◉ d.   Create a visual box around matched areas ✔

The correct answer is: Create a visual box around matched areas

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:35:10	Saved: Create a visual box around matched areas	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **24**

Correct

Mark 1.00 out of
1.00

Hide sidebars

Q5. The use of 28x28x1 shape in CNN input ensures that

○ a.　Feature maps use dropout as regularization

○ b.　Images are flattened for RNN input

○ c.　Image patches are square and color coded

◉ d.　Channel depth is preserved for grayscale images ✓

The correct answer is: Channel depth is preserved for grayscale images

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:36:21	Saved: Channel depth is preserved for grayscale images	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **25**

Correct

Mark 1.00 out of 1.00

Q5. Gaussian smoothing precedes derivative estimation to

○ a.   Remove chromatic aberrations

○ b.   Limit dynamic range in gradient magnitude

◉ c.   Suppress high-frequency noise that misleads gradient computation ✓

○ d.   Introduce frequency-domain constraints

The correct answer is: Suppress high-frequency noise that misleads gradient computation

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:36:34	Saved: Suppress high-frequency noise that misleads gradient computation	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 26

Correct

Mark 1.00 out of 1.00

Q13. Canny edge detection performs poorly in highly textured areas due to

- ○ a.   Excessive strong edge triggers at multiple orientations ✓
- ○ b.   Chromatic dominance in grayscale conversion
- ○ c.   Limited dynamic range
- ○ d.   Insufficient scale normalization

The correct answer is: Excessive strong edge triggers at multiple orientations

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:37:03	Saved: Excessive strong edge triggers at multiple orientations	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **27**

Incorrect

Mark 0.00 out of 1.00

Hide sidebars

Q10. Haar Cascades cannot identify specific object instances because they

- ○ a. Use unsupervised clustering of pixel data
- ◉ b. Lack capability for multi-class classification ✗
- ○ c. Rely on LBP rather than CNNs
- ○ d. Only recognize shape templates, not identity

The correct answer is: Only recognize shape templates, not identity

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:37:56	Saved: Lack capability for multi-class classification	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **28**

Correct

Mark 1.00 out of 1.00

Q19. Image colorization tasks require

○ a.   Chain code approximation of image masks

◉ b.   Filling grayscale regions with plausible chromatic values ✓

○ c.   Automatic dilation of binary shapes

○ d.   Fourier reconstruction of missing edge profiles

The correct answer is: Filling grayscale regions with plausible chromatic values

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:38:15	Saved: Filling grayscale regions with plausible chromatic values	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question **29**

Incorrect

Mark 0.00 out of 1.00

Hide sidebars

Q14. Boundary detection failures typically arise when

- ○ a.   High frequency filters are applied ✗
- ○ b.   Color saturation is too low
- ○ c.   Local contrast is insufficient
- ○ d.   Optical zoom is reduced

The correct answer is: Local contrast is insufficient

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:38:50	Saved: High frequency filters are applied	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

Question **30**

Correct

Mark 1.00 out of 1.00

Hide sidebars

Q8. Otsu's thresholding automatically

- ○ a. Minimizes pixel intensity values globally
- ⦿ b. Maximizes inter-class variance for threshold separation ✓
- ○ c. Adjusts RGB channels based on luminance
- ○ d. Applies a fixed binary threshold

The correct answer is: Maximizes inter-class variance for threshold separation

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:39:16	Saved: Maximizes inter-class variance for threshold separation	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 31

Correct

Mark 1.00 out of 1.00

Q13. Normalizing pixel values between 0 and 1 improves

- ○ a.   Loss convergence to binary entropy
- ○ b.   Activation saturation in ReLU
- ○ c.   Noise injection for regularization
- ◉ d.   Gradient flow and training stability ✓

The correct answer is: Gradient flow and training stability

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:40:03	Saved: Gradient flow and training stability	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Correct**	**1.00**

Question 32

Incorrect

Mark 0.00 out of 1.00

Hide sidebars

Q1. CNNs excel in image analysis because they

○ a.   Operate on raw pixel intensities without transformation ✗

○ b.   Apply gradient filters for text-based input

○ c.   Convert images to binary maps directly

○ d.   Use spatial hierarchies to extract multi-scale features

The correct answer is: Use spatial hierarchies to extract multi-scale features

Response history

Step	Time	Action	State	Marks
1	6/05/25, 12:12:03	Started	Not yet answered	
2	6/05/25, 12:43:36	Saved: Operate on raw pixel intensities without transformation	Answer saved	
3	**6/05/25, 12:47:56**	**Attempt finished**	**Incorrect**	**0.00**

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Jump to...

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Table of contents

> **Topic 10**

> **Topic 11**

> **Topic 12**

> **Topic 13**

> **Topic 14**

∨ **Topic 15**

Midterm Exam 🚫

> **Topic 16**

> **Topic 17**

> **Topic 18**

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