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Experiment 2 - CV

(Q1) How texture is useful in segmentation?
What are the different types of texture?

Ans. 1)

(i) Texture is useful in segmentation because it provides additional information about the spatial arrangement of pixel intensities in an image beyond just colour or intensity values.

(ii) Different regions in an image often exhibit different textures which can help in distinguishing between objects or segment during segmentation tasks.

(iii) Texture features can be used alongside other features like color, shape and intensity to improve the accuracy of segmentation algorithm.

(iv) Various types of texture include pattern such as smooth, rough, grainy, rough and repetitive structure.

Q2) What is GLCM? Explain with one image and its GLCM.

Ans2) GLCM is a statistical method used in image processing to characterise the texture of an image.

- It quantifies the relationship between pairs of pixels values occur at given spatial relationships ~~between~~ within an image.
- GLCM is typically represented as a matrix where each element represents the frequency of occurrence of pixel pair with gray-level values 'i' and 'j' at a specific distance and orientation

2	1	0	0
1	2	1	0
0	1	2	1
0	0	1	2

GLCM

1 unit to right

1 unit to down

0	1	2
0	2	1
1	3	2
2	1	3

Q3) What are different statistical methods to describe features?

- Ans3) i) Mean : Average value of feature
 ii) Variance : Measure of dispersion of spread of the feature value.

- (iii) Skewness : Measure of asymmetry in the distribution of the feature values.
- (iv) Kurtosis : Measure of "tailedness" of distribution of feature value.
- (v) Histogram : Frequency distribution of feature values.
- (vi) Entropy : Measure of randomness or uncertainty in distribution of feature values.
- (vii) Moments : Statistical measures calculated from distribution of feature values.
- Q4)
- Ans4) Fourier descriptors are primarily used for shape representation rather than texture identification.
- They represent the shape of an object by decomposing it into a set of sinusoidal components of different frequencies.

→ While Fourier descriptors can capture some aspects of texture they are not specifically designed for texture analysis.

T.Y. B.Tech. (ECE) Academic Year 2023-24 Semester: VI
Continuous Assessment Rubric

COURSE: Computer Vision (ECE4026B)

STUDENT:

EXPT NO.: 2

EVALUATOR: J. A. Lele

DATE:

DIMENSION	SCALE					SCORE (25)
	1	2	3	4	5	
Regularity and punctuality	Submitted without performance	Performed late and submitted later than scheduled date with permission	Performed on schedule; submitted two weeks late	Performed on schedule; submitted one week late	Performed and submitted as per schedule	5
Overall Understanding of experiment	Neither shows any understanding of the experiment nor can relate it to theory.	Objectives are not clear.	Can only state the objective but shows poor understanding	Understands objective but cannot place it in context of a theory topic	Understands objective and can relate it to an appropriate theory topic	4
Understanding the Procedure	Cannot follow the procedure	Follows the procedure half heartedly	Follows right procedure but cannot analyze data	Follows right procedure but can analyze data and interpret it without justification	Follows right procedure, can analyze data and interpret it with justification	6
Experiment Skills	Does not participate in experiment	Performs the experiment only with the help from supervisor/others and is confused.	Performs the experiment with some supervisory help but not keeping record.	Performs experiment on own without supervisory help. keeping record partially	Performs experiment on his/her own without supervisory help; records all readings properly. Keeps the setup clean.	5
Attitudes	Copies the results from others	Completes the result analysis with help from others but forgets to acknowledge the help.	Completes the result analysis with help from others and acknowledges the help.	Produces his own result analysis but tries to manipulate	Produces his own result analysis faithfully and owns up the results without any manipulation	5
Total						23

Teacher's signature with date:

Student's signature with date:

W.A.L
7/3/2024