



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal-500043, Hyderabad

B.Tech VII SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 2023

Regulation: UG-20

COMPUTER VISION

CSE(DATA SCIENCE)

Time: 3 Hours

Max Marks: 70

Answer ALL questions in Module I and II

Answer ONE out of two questions in Modules III, IV and V

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

1. (a) Mention the various phases of image processing. Illustrate the use of adaptive thresholding.
[BL: Understand| CO: 1|Marks: 7]
- (b) Describe about median filter-based corner detector and analyze the operation of the median detector.
[BL: Understand| CO: 1|Marks: 7]

MODULE – II

2. (a) Outline the concept of boundary descriptors in boundary pattern analysis. Discuss the use of active contours in edge detection.
[BL: Understand| CO: 2|Marks: 7]
- (b) How skeletons and thinning are useful in the analysis and description of shapes in binary images? Explain distance functions and its uses.
[BL: Understand| CO: 2|Marks: 7]

MODULE – III

3. (a) Write the importance of spatial matched filtering in images. Explain the foot-of-normal method in line detection and its applications.
[BL: Understand| CO: 3|Marks: 7]
- (b) Mention the steps involved in performing least squares line fitting. Are there any strategies to improve the accuracy of line localization? Elucidate.
[BL: Understand| CO: 3|Marks: 7]
4. (a) Elaborate the applications of the hough transform to line detection with an example.
[BL: Understand| CO: 4|Marks: 7]
- (b) How RANSAC model is highly effective for straight line detection? Discuss the concept of hole detection.
[BL: Understand| CO: 4|Marks: 7]

MODULE – IV

5. (a) How optical flow is useful in 3D vision? Write in detail about the 3D object recognition schemes.
[BL: Understand| CO: 5|Marks: 7]
- (b) What are projection schemes in 3D vision and why are they essential for understanding the 3D world? Summarize the application of shape from texture in 3D vision.
[BL: Apply| CO: 5|Marks: 7]

6. (a) Discuss in detail about the concept of triangulation and bundle adjustment in motion. [BL: Understand| CO: 5|Marks: 7]
- (b) Explain the basic idea of photometric stereo. How does "photometric stereo" work and what kind of information does it provide? [BL: Understand| CO: 5|Marks: 7]

MODULE – V

7. (a) Outline the process of Eigenfaces in face recognition. Explain about the human gait analysis. [BL: Understand| CO: 6|Marks: 7]
- (b) Write a short note on foreground background separation. How does foreground background separation benefit image processing? [BL: Understand| CO: 6|Marks: 7]
8. (a) List the applications of particle filters. Elaborate in detail about chamfer matching, tracking and occlusion. [BL: Understand| CO: 6|Marks: 7]
- (b) How various views are combined from multiple cameras? Describe the concept of active appearance model. [BL: Understand| CO: 6|Marks: 7]

