

**67104-N**

**M.C.A. 3rd Semester (MCA 2 Year Programme)**

**w.e.f. 2021-2022 Examination, November-2023**

**COMPUTER VISION ELECTIVE 1 (i)**

**Paper-21MCA23DA1**

***Time allowed : 3 hours]***

***[Maximum marks : 80***

***Note:*** *Student will be required to attempt Five questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.*

**Compulsory Question**

**1. Attempt the following:  $8 \times 2 = 16$**

- (a) What is two stage recognition scheme?
- (b) Define Contrast Stretching.
- (c) What are problems associated with circle detection approach?
- (d) Write any two characteristics of a good feature.
- (e) How does 3D vision created? Explain.
- (f) Draw spline based motion using example of your choice.
- (g) How are Eigen faces associated with recognition?
- (h) Define particle filter. What is it used for?

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Unit-I

2. (a) What do you mean by filtering? Explain at least three classical filtering operations giving some examples of your choice. 8

(b) Differentiate between the following:  $2 \times 4 = 8$

(i) Thickening and Thinning

(ii) Opening and Closing

3. (a) What is the process of Erosion used for? How is it related to Dilation? Explain. 8

(b) What is co-occurrence matrix of an image? Write co-occurrence matrix of the image below taking  $d(1,0)$  and  $d(1,\pi/2)$ . 8

0	0	1	1	1
1	0	0	1	1
1	2	2	3	3
1	2	3	3	3
3	4	5	5	5

Unit-II

4. (a) Explain the terms involved and procedure of Hough Transformation for line detection with diagrams. 8

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- (b) What is Iris located in image? Explain all the mathematical objects and operations involved in detection of human iris in an image. 8

5. What are the challenges associated with accurate center location in circular object detection using the Hough Transform. Discuss techniques that can be used to improve the precision of circle center localization. 16

### Unit-III

6. Explain in brief the concept of shape from shading, shape from texture and their relation with the photometric stereo. 16
7. Describe the triangulation method for 3D vision. Discuss how the geometry of multiple camera views can be used to determine the 3D position of points in a scene. 16

### Unit-IV

8. (a) What do you mean by surveillance? How does computer vision used for doing so? 8
- (b) Write notes on the need of background separation in images and the techniques used in it. 8
9. (a) Differentiate between face detection and face recognition. 8
- (b) How does computer vision related to locating roadways for an in-vehicle vision system? Explain the concepts and methods used in it using diagrams. 8