



R20 Regulation

Subject code: 3P6GC

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

**B.Tech VI Semester Supplementary Examinations, February 2023**

## ADVANCED COMPUTER VISION

(CSE(AI&ML))

**Maximum Marks: 70**

Date:20.02.2024 Duration: 3 hours

- Note:**
- 1.This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

### Part-A

All the following questions carry equal marks		(10x2M=20 Marks)	CO	Bloom Tx
1	What is the purpose of Fourier transforms in computer vision?		CO1	L1
2	What is the main goal of geometric transformations in computer vision?		CO1	L1
3	what is the primary difference between points and patches in feature detection and matching?		CO2	L1
4	What is the purpose of geometric intrinsic calibration in feature-based alignment?		CO2	L1
5	What is the purpose of bundle adjustment in Structure From Motion (SFM)?		CO3	L1
6	What is optical flow in dense motion estimation?		CO3	L1
7	What is image stitching.		CO4	L1
8	In computational photography, what technique is used to enhance the resolution of an image beyond its original capture resolution?		CO4	L1
9	What is the primary purpose of texture analysis in computational photography?		CO5	L1
10	What is the main objective of video-based rendering in computational photography and computer vision?		CO5	L1

### Part-B

Answer All the following questions.		(5X10M=50Marks)		
11	How wavelets and pyramids used in computer vision, and what are their respective advantages and applications? [10]		CO1	L2
OR				
12	How do linear filters contribute to image processing in computer vision, and what are some common applications of linear filtering techniques? [10]		CO1	L2
13	A. What is the purpose of pose estimation in feature-based alignment, and what are some common applications where pose estimation is utilized? B. Explain the concept of region-based segmentation and discuss the advantages and limitations of this approach. [5+5]		CO2	L1
OR				
14	A. Discuss the principles and methodologies behind active contours, split and merge, mean shift and mode finding, and normalized cuts. Explain their respective advantages, limitations, and common applications. [10]		CO2	L2

15	Explain the process of Structure From Motion (SFM) using a bundle adjustment approach and discuss its significance in 3D reconstruction from multiple images. [10]	CO3	L2
	OR		
16	A. Discuss the concept of factorization in Structure from Motion (SFM) and explain its role in the reconstruction of 3D scenes from image sequences. B. What is the main advantage of using layered motion estimation over other dense motion estimation techniques? [5+5]	CO3	L2
17	A. Explain the process of image stitching, including motion models, global alignment, and compositing, and discuss the significance of image stitching in creating seamless panoramic images from multiple overlapping images. [10]	CO4	L2
	OR		
18	A. Elaborate on the challenges faced in image stitching, explore its diverse applications across various fields, and discuss potential future directions in advancing the field? B. How does image matting and compositing contribute to the creation of visually appealing and realistic composite images in computational photography? [5+5]	CO4	L3
19	A. Discuss the challenges and limitations of Model-Based Reconstruction in 3D reconstruction, and compare it with other techniques such as Structure from Motion. B. Explain the concept of Context and Scene Understanding in the field of Recognition, and explain its importance in image interpretation and semantic understanding. [5+5]	CO5	L2
	OR		
20	A. Explain the process of recovering texture maps and albedos in Model-Based Reconstruction, and discuss their significance in enhancing the visual realism of the reconstructed 3D models. [10]	CO5	L2