Roll No. | | | | | | | | | | |

Total No. of Questions : 09

Total No. of Pages : 02

B.Tech. (AI&DS/CSE/AIML) (Sem.–7,8)

COMPUTER VISION

Subject Code : BTAIML 701-20

M.Code : 94006

Date of Examination :17-12-2024

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

   a) Discuss the effects of quantization on an image and how can those be addressed or minimized?

   b) What is pixel connectivity? Discuss briefly different types of pixel connectivity.

   c) Discuss the advantages of filtering in frequency domain over spatial domain.

   d) Differentiate between image degradation and image restoration.

   e) Write some applications of wavelet transform in image processing.

   f) Write a short note on Haar Transform. How is it used to decompose an image into different frequency subbands?

   g) Differentiate between Stereo reconstruction and Multiview reconstruction.

   h) Write a short note on loss functions.

   i) Discuss briefly about patterns and pattern classes.

   j) What is feature-based object recognition?

SECTION-B

2. Differentiate between spatial and sharpening spatial filters with the help of an example.

3. Explain the general model for image degradation and restoration. Discuss some common types of image degradation.

4. Discuss the concept of erosion and dilation. Explain how are they used to perform basic operations on binary images?

5. What role does epipolar geometry plays in stereo and multiview reconstruction? How are the fundamental and essential matrices used to compute epipolar lines?

6. What are the advantages and disadvantages of template matching and feature-based methods for object recognition?

SECTION-C

7. Describe different types of noise in images and their sources. How can the noise be eliminated or reduced in the images using image processing techniques?

8. Explain Fast Fourier Transform (FFT) and discuss how it can be used to efficiently compute the DFT of large images? Describe key challenges in implementing efficient FFT algorithms.

9. Explain the concept of Hit-or-Miss transformation and explain how it can be used to detect specific features in binary images? Discuss various applications of Hit-or-Miss transformation in image processing.

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