CBCS SCHEME

18ECS321

Third Semester M.Tech. Degree Examination, Dec.2019/Jan.2020
Advances in Image Processing

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Explain briefly the metric properties of digital images.   (10 Marks)
    b.   What is meant by the term color? Explain in detail color perceived by humans.   (10 Marks)

OR

2   a.   Explain the concept of Sampling and Quantization of an Image and explain how images are digitally represented.   (10 Marks)
    b.   What is a color space? Explain any two color space classification in detail.   (10 Marks)

Module-2

3   a.   Briefly describe the two classes of pixel brightness transformations.   (10 Marks)
    b.   Explain the principles of nearest-neighbor interpolation, linear interpolation and bicubic interpolation.   (10 Marks)

OR

4   a.   Name smoothing methods that try to avoid image blurring. Explain their main principles.
                                                                                    (10 Marks)
    b.   What are LOG and DOG? How do you compute them? How are they used?   (10 Marks)

Module-3

5   a.   Briefly describe the different thresholding concept of image segmentation process. (10 Marks)
    b.   Explain the algorithm that provides Inner boundary tracing in both 4-connectivity and 8-connectivity.   (10 Marks)

OR

6   a.   Explain the principles of and differences among the three basic approaches to region growing-merging, splitting and split and merge.   (10 Marks)
    b.   What are the main difference between A – algorithm graph searching and dynamic programming? Explain why dynamic programming is often faster than the A – algorithm.
                                                                                    (10 Marks)

Module-4

7   a.   Briefly explain any five Scalar Region Shape descriptors.   (10 Marks)
    b.   Explain the concept of B - spline curve Interpolation.   (10 Marks)

OR

8   a.   Define any four biometric border based region descriptors.   (10 Marks)
    b.   An object is described by the following chain code in 4 – connective 300301121232.
         (i)   Determine the normalized version of the chain code.
         (ii)   Determine the derivative of the original chain code.
         (iii) Define Freeman's code.   (10 Marks)

Module-5

9 a. Explain four morphological principles with necessary equation. (10 Marks)
   b. Give the definition of erosion and dilation for binary images and mention the differences between erosion and dilation by illustrating the properties. (10 Marks)

OR

10 a. What is geodesic distance? How it is used in mathematical morphology? Explain in detail with necessary equation. (10 Marks)
    b. Explain the role of Markers in morphological segmentation. Why would an attempt to perform watershed segmentation without markers lead to over segmentation? (10 Marks)

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