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M.Tech II Semester Supplementary Examinations January/February 2019 DIGITAL IMAGE & VIDEO PROCESSING

(Common to DECS, DSCE, ES, VLSI&ES, ES&VLSI and VLSI&ESD) (For students admitted in 2017 only)

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Time: 3 hours

Max. Marks: 60

Answer all the questions

- 1 (a) Show that the F.T of convolution of two functions is the product of their Fourier transforms.
 - (b) Differentiate uniform and non uniform sampling.
 - (c) Obtain the Haar transform matrix for N = 8.

OR

- 2 (a) Discuss about Walsh transform.
 - (b) What is energy compaction property? Derive the Kernel coefficients of N=8 of DCT.
 - (c) Discuss about CWT and its applications.
- 3 (a) Explain the following: (i) A model to determine edges. (ii) Histogram equalization.
 - (b) Explain the steps in morphological processing when an image is corrupted by noise, where the original image objects are much larger in size than the noise.

OR

- 4 (a) What is meant by region based segmentation? Discuss about region growing.
 - (b) Explain the following: (i) Image registration. (ii) Contrast stretching.
- 5 (a) Explain why deterministic grammars are too restrictive for description of real-world textures.
 - (b) Explain how the chain code boarder representation is done. Give an example.

OR

- 6 (a) Explain the following: (i) Euler's number for shape descriptors. (ii) Fine and coarse textures.
 - (b) Give a scheme/algorithm for computing co-occurrence matrix.
- 7 (a) Explain the maximum likelihood algorithm for pattern classification.
 - (b) Classify the X = (6, 5) into any one of the three classes characterized by the following decision function:

$$d_1(x) = -x_1 + x_2, \ d_2(x) = x_1 + x_2 - 5, \ d_{3(x)} = -x_2 + 1$$

- 8 (a) Explain a cluster-seeking algorithm in detail.
 - (b) Classify the pattern x = (4, 3) into any one of the three classes characterized by the following decision function:

$$d_{12}(x) = -x_1 - x_2 + 5$$
, $d_{13}(x) = -x_1 + 3$, $d_{23}(x) = -x_1 + (-x_2)$

- 9 (a) What is a frame in a video? How it is related and helps in background subtraction?
 - (b) What is meant by optical flow? Illustrate the block matching algorithm to find motion vector.

OR

- 10 (a) Discuss about static and dynamic back ground modeling.
 - (b) Discuss about the procedure handle occlusion. What is the purpose of it?
