

PG/CSE/T/116A/2018

M. C. S. E. 1st Year 1st Semester Examination 2018

Image Processing

Time: **Three hours**

Full Marks: **100**

Answer the *first* question and any *four* others

1. Explain histogram equalization with a numerical example. What a priori knowledge dictates you to use it on image windows rather than on the entire image?
b) Extreme image contrast leads to loss of detail in image viewing. What do you propose for that?
14+6

 2. Propose a model for local edge detection filters and then use it to derive filters for detecting edges in orthogonal directions.
20

 3. Given a gray-scale image describe the Otsu's method for selecting the threshold for converting it into binary and then an algorithm to actually convert it.
20

 4. Propose a model for noise removal techniques and derive local filters for the same.
20

 5. Develop a connected component labeling algorithm. Propose a set of parameters for characterizing connected components. How can such a set be used to distinguish different connected components?
4+12+4

 6. How is binary dilation a natural candidate for parallel processing? Explain with digital examples, the significance of HMT and K-tolerance template matching. How is the concept of 4- or 8- connectedness going to affect pattern recognition?
8+8+4

 7. How are opening and closing unique as image processing operations? Propose a morphological algorithm for detecting the parts of a human-like binary image.
20

 8. Write a note on Kittler and Illingworth algorithm.
20
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