MULTIMEDIA SIGNAL PROCESSING

HOMEWORK 1

Problem 1:

Topic: Point Process-Ordered Dithering using the Classical-4 & Bayer-5 Dither Array

Write an algorithm to convert the Gray Scale Image (0-255 Range) to Binary Image (0-1 Range) using the mentioned dither array.

Problem 2:

Topic: Neighborhood Process – Error Diffusion

In error diffusion three kernels are widely used Stucki (1981), Jarvis (1976), Floyd-Steinberg (1975)

Write an algorithm to convert the Gray Scale Image (0-255 Range) to Binary Image (0-1 Range) based on the mentioned error diffusion kernels.

Homework sections should include

1)Title 2) Code 3) Results 4) Inference/Discussion on results

Any programming language can be used.

For beginners (in image processing) please refer to the following links

MATLAB:

http://users.ece.utexas.edu/~bevans/projects/halftoning/toolbox/

http://imageprocessing-sankarsrin.blogspot.tw/2016/12/digital-half-toning-ordered-dithering.html

C++: *https://github.com/yunfuliu/pixkit*

Reference: Study Material

[1] https://engineering.purdue.edu/~bouman/grad-labs/Image-Halftoning/pdf/lab.pdf

[2] https://www.cs.princeton.edu/courses/archive/fall00/cs426/lectures/dither/dither.pdf

Additional Bonus: Implement Dot-diffusion halftones and Direct binary search halftone algorithm