Digital Image Processing (2017)

Homework 1

{Image input/output + Resolution + Scaling}

Deadline: 106.10.16

Image input/output (30%)

Using C++ or C, accomplish File Read Write of BMP format.
Please notice Bit Depth of the images.

[Input]   input1.bmp   input2.bmp
[Output] output1.bmp   output2.bmp

Demo: Run and check the output files and your code.
Report: Explain BMP format and other format (at least one)
          in at most 2 pages (A4).
File: ImgRWbmp

Resolution (30%)

Using C++ or C, accomplish the discussion of Quantization Resolution.
Please refer to the lecture slide (Fundamentals, page 17).

[Input]   input1.bmp   input2.bmp
[Output] output1_1.bmp   output2_1.bmp
          output1_2.bmp   output2_2.bmp
          output1_3.bmp   output2_3.bmp

Demo: Run and check the output files and your code.
Report: Do some discussion and explain how you do it in at most 2 pages (A4).
File: ImgQR

Scaling (40%)

Using C++ or C, accomplish Up-scaling and Down-scaling by Bilinear Interpolation with rate 1.5. (Basic Operation, page 38)

[Input]   input1.bmp   input2.bmp

[Output] output1_up.bmp   output2_up.bmp

output1_down.bmp   output2_down.bmp

Demo: Run and check the output files and your code. (ScalingDemo.bmp)

Report: Do some discussion and explain how Bicublic interpolation works in at most 2 pages (A4).

File: ImgScaling

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Homework Rules and Grading Policy

Homework will be graded by:

1. Correctness
2. Algorithm description
3. Discussion

Upload:

[web]   E3

[File Name]   hw1_StudentID.zip (ex: hw1_1234567.zip)

Remind:

1. Your C, C++ or Matlab code with comments.
2. Your report in the format of .pdf.
3. ReadMe.txt file which describes how to run your program.
4. Hand in a hard-copy of your report in the class on the due date.
5. Deadline

    If you have a late submission by 1 to 7 days, you will only get 70% of the score.

    We DO NOT accept any late submission after 7 days after the deadline.