HW1 Regrading Session

Dear all,

Your scores and feedbacks of HW1 have been posted, please check them.

We will hold a regrading session **at EEB10 for 2:30–4:30 PM on Monday, February 4th**. If you had any issues about your scores, you could show up at that time or just email us. But before this, please **first check the grading criteria below** and find whether there is grading error in your assignment.

P1: (by Yao Zhu)

(a) (1) 6 pt. correct results. Need to handle pixel value >255, < 0 (1 pt.). Boundary extension (1.pt)

(2) 2 pt. observations, causes: false color, zipper effect …; 2 pt. improvements: don't require implementation. Can't be MHC method.

(b) (1) 14 pts. Boundary extension: 2 pts; Pixel value $>$ 255, <0: 2 pts.

(2) Comparison: 3 pts. 1 pts for computational complexity; Explanation: 3 pts. Consider the correlation among the RGB values (2 pts).

(c) (1) 3 pts: six correct histograms.

(2) 4 pts: image results (3 pts), transfer function (1 pts) (maximum value for y axis is 1).

(3) 4 pts : image results (3 pts), cumulative histogram (1 pts).

(4) 2 pts: don't need to implement.

(5) 5 pts: image results (2 pts), histogram (input, output) (1 pts), improve (2 pts.): don't need to implement.

P2: (by Yingpeng Deng)

(a) (1) Uniform noise. (3 pts)

(2) PSNR plots (5 pts): (uniform filter) lowest PSNR value for window size = 1; highest PSNR value for window size = 3; (Gaussian filter) PSNRs are equal for the two distributions if window size = 1; PSNR is higher for Gaussian filter when window size is larger than 3; (both) Monotonically increasing before peak and decreasing after peak; line chart. Each counts 1 pt until all pts are lost in (2).

(3) The filter has its effect on noisy image. (3 pts) Discuss the effects of σc and σs on denoising and edge-preserving. (2 pts)

(4) The filter has its effect on noisy image. (4 pts) Discuss the relation between computational complexity and search window size. (3 pts) Bonus: Discuss the effects of Euclidean distance or weighted function. (2 pts. Only for (4)).

(b) (0) Denoising results. (4 pts)

(1) Yes. (4 pts)

(2) Median filter and low-pass filter. Or any combination of filters which can deal with impulse noise and Gaussian noise separately. (4 pts)

(3) No. First use median filter to remove impulse noise, then low-pass filter, or equivalent. (4 pts)

(4) Bilateral filter/Non-local mean filter/BM3D/Neural network based approach/other advanced filters. Discuss the reason. (4 pts)

(c) (1) The filters have their effects on noisy images; denoised images are inversely transformed. (5 pts)

(2) BM3D is better than Gaussian filters; illustration from PSNRs and visual results. (5 pts) Bonus: The effects of biased and unbiased inverse on brightness (2 pts); the advantage of exacting unbiased inverse (2 pts). Only for (2).