

## 2018 Fall Advance Digital Image Processing Homework #2-1

EE 245765

Advisor: 電子所 高立人

106368002 張昌祺 Justin, Chang-Qi Zhang

justin840727@gmail.com

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### Problem 1 Grey-level resolution with C++

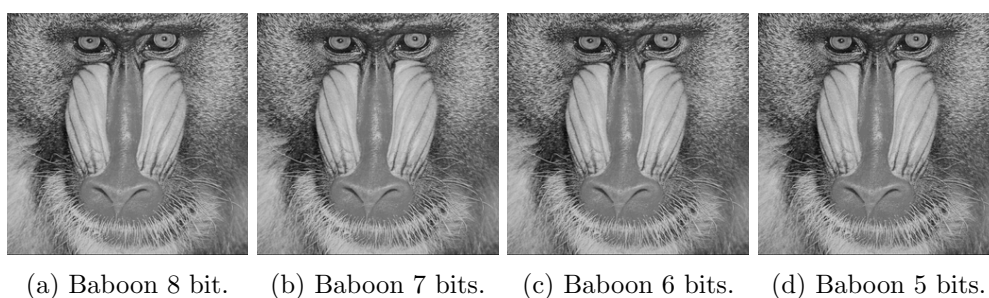
- a. Using C/C++ to quantize the gray-level resolution of lena\_256.raw and baboon\_256.raw from 8 bits to 1 bit. Show the results of these quantize images and explain the difference between each result image. (Figure, 15%; Discussion, 10%)

**Ans**

Firstly we take a look the result images which are generated by my program for both Lena and baboon grey-level resolution from 8 bits to 1 bit.



Figure 1: lena\_256.raw grey-level resolution from 8 bits to 1 bit.



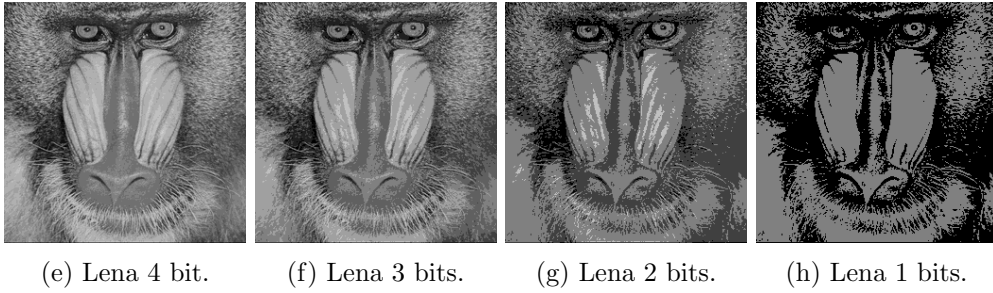


Figure 2: baboon\_256.raw grey-level resolution from 8 bits to 1 bit.

In this section, we compare **False Contouring** between Lena (Figure 1) and Baboon (Figure 2) images. In Lena's case, when the grey-level resolution down to 3 bits. The figure shows obvious False contouring. In Baboon case, the false contouring effect happens in 2 bits grey-level resolution. Then we know false contouring might happen in different bit number in different detail images. For low detail image like Lena, we need to represent the image with more bits than high detail baboon image. The results for this problem is matching the Isopreference Curve theory.

- b. Calculate the corresponding with MSE (Mean Square Error, study yourself) and PSNR value. (Discussion, 10%)

**Ans**

**Source code for Problem 1**

## References

- [1] Fred G. Martin *Robotics Explorations: A Hands-On Introduction to Engineering*. New Jersey: Prentice Hall.
- [2] Flueck, Alexander J. 2005. *ECE 100*[online]. Chicago: Illinois Institute of Technology, Electrical and Computer Engineering Department, 2005 [cited 30 August 2005]. Available from World Wide Web: (<http://www.ece.iit.edu/~flueck/ece100>).