Digital Image Processing (1091)

Homework #1 (DUE: 2020.10.21)

(Please note that you have to upload your source codes (and a brief description about your codes or algorithms, optional) to the server before the deadline. Please check the course website for more details.)

Construct a simple image processing tool with the following requirements:

1. Design a simple graphic user interface for the following functionalities.
2. Open/save/display 256-gray-level images in the format of JPG/TIF.
3. Adjust contrast/brightness of images by the changing the values of "a" and "b" in 3 different methods:
   (A) linearly ($Y = aX + b$);
   (B) exponentially ($Y = \exp(aX+b)$);
   (C) logarithmically ($Y = \ln(aX+b)$, $b > 1$).
4. Zoom in and shrink with respect to original size of images by using bilinear interpolation.
5. Rotate images by user-defined degrees.
6. Display the histogram of images. An "auto-level" function by using histogram equalization should be provided.