Digital Image Processing (1111)

Homework #1 (DUE: 2022.10.05)

(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. Gray-level slicing : display images from certain range of gray levels given by users. Requirements: (1) users can define the range of gray level to be displayed; (2) users can choose either preserve original values of unselected area or display them as black color.