The American University in Cairo

Department of Computer Science and Engineering

CSCE 4603 – Fundamentals of Computer Vision

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Assignment released September 26th, and due by end of October 13th

1. Implement a pinhole camera and take pictures with it to use in the following question. **[2 pts]**

2. Please develop a program in your preferred programming language that performs the following transformation categories to any input grayscale image.

    a. translate, scale, and rotate around an ***arbitrary point*** of the image. Rotation angle can be any arbitrary value in the range -90 to +90. Your program should allow for combined transformations. **[3 pts]**
    b. choose at least 2 of the following gray level transformations: **[2 pts]**
        i. negative.
        ii. log and inverse log.
        iii. n^{th} power.
    c. histogram equalization. **[2 pts]**

Your program should expect as input a grayscale (8 bits/pixel) image, desired transformation, and the transformation parameter (if any, like the n in n^{th} power, or the rotation angle in the rotation transformation, etc...).

You can use OpenCV (or any other image manipulation platform) to help you open the input image and save the transformed image in any of the standard image formats. However, you should perform all transformations on your own.

You are expected to deliver:

a) source code of your program.
b) short report describing your work including snapshots of your home-made camera setup, the original taken images and the output of each transformation. **[1 pts]**