CALIFORNIA STATE UNIVERSITY, LONG BEACH

College of Engineering
Department of Computer Engineering and Computer Science
Dr. Thinh V. Nguyen
Spring 2013
CECS-553/653: Machine Vision

PROJECT 1

Name: _____

Last, First

- **Dates:** Date assigned: Wednesday February 6, 2013. Date due: Wednesday **March 27, 2013**. Late submissions will receive penalty at 10% per day. This project is worth 40% of the project grade.

- **Objectives**: The objectives of this project includes: (1) to familiarize students with the bitmap image file format, (2) to perform edge detections.

- **Project Description:**

  Write a computer program to read in an image named "image.bmp" where *image* is the input to the program and is selected from the image database. If the image is color, save the image in grey level as "image_grey.bmp". Note that the word "image" should be replaced with the appropriate image file name.

  Perform the following operations:

  1) Edge detection using Roberts, Sobel, Prewitt, and Robinson operators: (40 points) Apply the Roberts, Sobel, Prewitt, and Robinson operators on the image_grey.bmp. Show the resulting output. Then, threshold the output images to obtain the edge images. The edge pixels are black and the non-edge pixels are white. Discuss how you select the threshold to obtain the edge images.

  2) Edge detection using Laplacian of Gaussian: (60 points) Apply the Laplacian of Gaussian with mask sizes of 11x11 and 21x 21 on the above images. Show the values of the masks. For each mask size, select various values of σ. Use zero crossings to detect the edges. Discuss the effects of mask size and σ on the resulting edge images.

  3) Results: Use the following images: actress.bmp, pattern2.bmp, coins.bmp. Use any additional images and/or values of NxN as appropriate.

- **Project Report:** Follow the required format. Attach this sheet as cover sheets for the report. Attach printouts of the above images as embedded pictures in the text. Scale the images to fit about 1/3 to ¼ of the page. Discuss the results and specific implementations

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