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 2

Name: _____

Last,   First

☐ **Dates:** Date assigned: Wednesday April 6, 2013. Date due: Final Exam Day at the beginning of the exam. No Late submissions will be accepted. This project is worth 60% of the project grade.

☐ **Objectives**: The objectives of this project includes: (1) to perform component labeling, (2) to perform mathematical morphology; and (3) to perform line, circle, or corner detection.

☐ **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.

(a) Coins   (b) B2Bomber

Perform the following operations:

1) Mathematical morphology: (25 points) Perform an appropriate thresholding on the coins.bmp so that the image contains only black (foreground) and white (background). Then, select an appropriate structure element and appropriate mathematical morphological operators (e.g., closing, opening) to operate on the thresholded coins.bmp such that the coins are well separated from one another. Show the results at each step.

2) Connected Component Labeling: (25 points) Apply the recursive connected component labeling on the result of the above mathematical morphology to label the coins. From this, determine the number of coins. Show the image result with different colors or shades of the coins (each coin has a distinct color or shade).

3) <u>Line Detection</u>: (25 points) Perform an edge detection on the gray level B2Bomber image. Use an appropriate edge detector. Then, apply the Hough Transform to detect the lines present in the edge detected image

4) <u>Corner Detection</u>: (25 points) Apply any corner detector to detect corner points on the gray level B2Bomber. Do not perform edge detection on the image.

☐ **Project Report:** Follow the required format. Attach these sheets 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.

END OF DOCUMENT