Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Computer Science and Technology Degree Programme
3rd year 2nd Semester Examination August/September 2014
CST362-3 Digital Image Processing

Uva Wellassa University

- Answer all the questions.
- Time Allowed: **Two (02) hours.**
- Download resource.zip file from the CMS which includes all the resource images for examination.
- Upload only your **cpp file** (C++ source file) to the CMS.
- You are allowed to refer your own notes but **sharing notes** is **strictly prohibited.**

Part (B)

1. Enhance *xray.png* image by applying an appropriate image enhancement method and show both source and enhanced image in OpenCV windows. Note that your final image should be more descriptive than the source image.

(10 mark)

2. The *signals.jpg* image includes two (2) traffic signals. You are required to identify these traffic signals separately by applying image processing techniques. Write a program to do this identification and output your results as an image, your final output should be similar to the *signalOutput.jpg* image. Continue your coding in a one source file by answering to the following questions.

    a. Open *signals.jpg* and change the color space from RBG to Gray Scale.
    b. Apply the fixed-level threshold of 128 to the gray scaled image and show the output in an OpenCV window. Note that type of the thresholding should be Binary.
    c. Find the contours in the binary image by using mode of CV_RETR_TREE.
    d. Draw and show all the contours detected by the algorithm on an OpenCV window.
    e. Identify the two (2) rectangles by examining the hierarchy of the contours and show only these two (2) contours on an OpenCV window.
    f. Differentiate two figures by examining child contours of determined contours. Draw number of child contours on each contours as shown in signalOutput.jpg image.
    g. Draw the texts 'STOP' and 'FALING ROCKS' on corresponding figures and show your final output to the user.
    h. Save your final output with *signalOutput.jpg* file name.

(40 mark)

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