ME 5405 Machine Vision

Assignment

Computing Project

You are required to form a group of 2-3 students to work on the computing project. <u>The software must be developed using MATLAB.</u> Your report should include the followings:

- 1. an introduction to the problem,
- 2. a description of your algorithm and flow chart,
- 3. screen dumps of every stage of the image processing,
- 4. an explanation on why you choose the method employed in your project, and
- 5. a conclusion including comments on how processing the <u>two images</u> are similar and/or different.

Image 1: Available on LumiNUS-ME5405-Files-Lecture Notes – charact1.txt Image 2: Available on LumiNUS-ME5405-Files-Lecture Notes – charact2.bmp

Images 1 is a 64x64, 32 level images. The image is shown a coded array that contains an alphanumeric character for each pixel in the image. The range of these characters is 0-9 and A-V, which corresponds to 32 gray levels. Image 2 is a BMP image of a label on a microchip.

For each image, perform the following tasks:

- 1. Display the original image on screen.
- 2. Create a binary image using thresholding.
- 3. Segment the original image to separate and identify the different characters.
- 4. Rotate the characters in the image about their own respective centroids by 90 degrees clockwise.
- 5. Rotate the characters in the image from Step 4 about their own respective centroids by 35 degrees counterclockwise.
- 6. Determine the outline(s) of characters of the image from Step 3.
- 7. Determine a one-pixel thin image of the characters from Step 3.
- 6. Scale and display the characters of <u>Image 1</u> in one line with the sequence: **1A2B3C**.
- 7. Scale and display the characters of <u>Image 2</u> in one line with the sequence: **7M2HD44780A00**.

You should upload your report and software to LumiNUS-ME5405-Files-Student Submission by 20 November 2019, 23:00 hours.

This is a group project. Please submit only one set of report and software. All members of the group will receive the same scores.

Image 1

000000000B1H000000000000000MIRRRSLS000000000000000C0J1kLL000000 00000004LLK50000000000000KNNOPONK00000000000HJNHDEJKJ00000 00000000CMMLJ000000000000MMD4579MMF0000000000BKL40004FJC0000 00000002LMILM4000000000000LMS0000EMJ00000000JM7000003C90000 00000005M340M0000000000000001M040000CMF00000000005KK0000000000000 0000000BMB07NM0000000000002LNA00003NM30000000DKH000000000000 00000001 301KN20000000000001MOMPROLM30000000000CL 0000000000000 000000DN0UUUMML0000000000030N300000M1000000001KM400000LN0000 000001KLH0FFFMMD0000000003L0500001MN200000000FLK00000BJH0000 000000004MJ000000000000000002STRRD0000000000000000NNLM9000000 000000009MI000000000000000BA0000FME0000000000000000000EJ30000 0000000007MH0000000000000000JMB00000000000000DJB00005H00000 000000007MH0000000000000000AMMJADFID0000000003IK40030ID0000

Image 2

