### 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 or its open source alternatives such as Octave, Scilab or FreeMat.</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.

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.

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

#### For each image,

- 1. Display the original image on screen.
- 2. Threshold the image and convert it into a binary image.
- 3. Determine the outline(s).
- 4. Segment the image to separate and identify the different characters.
- 5. Rotation of the characters about their own respective centroids by 90 degrees clockwise.
- 6. Rotation of the characters about their own respective centroids by 30 degrees counterclockwise.
- 7. Determine a one-pixel thin image of the characters from Step 4.
- 8. Scale and display the characters of <u>Image 1</u> in one line with the sequence: **A1B2C3**.
- 9. 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 IVLE-ME5405-Files-Student Submission by 21 November 2017 (Tuesday) which is about one week before ME5405 final examination.

#### Image 1

000000000B1H000000000000000MIRRRSLS000000000000000C0J1kLL000000 00000004LLK50000000000000KNNOPONK00000000000HJNHDEJKJ00000 00000000CMMLJ000000000000MMD4579MMF0000000000BKL40004FJC0000 00000002LMILM4000000000000LMS0000EMJ00000000JM7000003C90000 0000005M340M000000000000001M040000CMF0000000005KK000000000000 0000000BMB07NM0000000000002LNA00003NM30000000DKH000000000000 00000001 301KN20000000000001MOMPROLM30000000000CL 0000000000000 000000DN0UUUMML0000000000030N300000M1000000001KM400000LN0000 000001KLH0FFFMMD0000000003L0500001MN200000000FLK00000BJH0000 000000004MJ000000000000000002STRRD0000000000000000NNLM9000000 0000000007MH0000000000000000JMB00000000000000DJB00005H00000 000000007MH0000000000000000AMMJADFID0000000003IK40030ID0000 

# Image 2

