COMP27112
Computer Graphics and Image Processing
Coursework Assignment 5
Thresholding an image

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2018-2019

1 Introduction

Today's lab consists of thresholding an image. Thresholding is the operation that transforms an input greyscale image into an image whose pixels can take one of two values only. To perform thresholding, a threshold value, θ, is defined. The thresholding operation is achieved by comparing each pixel value, f(i, j), against the threshold and setting the output appropriately (g(i, j) is the output):

$$f(x) = \begin{cases} 0 & \text{if } f(i,j) \leq \theta \\ 1 & \text{otherwise} \end{cases}$$

Thresholding has a multitude of uses in image processing, e.g. in making decisions regarding the identity of objects or pixels.

2 Setting up

Create a subdirectory called **cwk5** and copy any resources you think you'll need, plus the images provided in Blackboard.

3 Let's begin

The idea: The program loads a greyscale image (which, as you should know by now, is a CV_8UC1 mat), thresholds it using some value for θ and displays the output in a window. The theta value must be adjustable using a slider.

It might be helpful to declare the mats globally (outside of the main scope) so that they can be accessed by other functions.

The OpenCV2 library provides the function **cv::threshold(src, dst, theta, maxValue, thresholdType)**. The source and the destination must be mats and the parameters theta and maxValue are doubles (but you most likely want to treat them as integers). As you'll soon discover, there are multiple ways of thresholding an image. The function described above is called binary thresholding because it only outputs 0 (black) and 1 (white). Therefore, the thresholdType is CV_THRESH_BINARY (you can experiment with the different types of thresholding that you can find in the OpenCV documentation).

4 Queries

The method you've implemented applies θ to the image globally. For some images this works, for others it doesn't. How can you modify the function to get a better result?

5 Submit

Zip the result images and **submit** it.