

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 1/6

_____, _____
Last Name,

First Name

Quiz Instructions

This exam is an open-book exam. However, your programs need to be your own creation. In other words, any form of communications on this exam between you and anyone else (except the instructor) is prohibited until after submission deadline and you are not allowed to use codes you found on-line or anywhere (except for the sample codes in lecture notes or class web-site).

Also notice that the images provided in this exam might be colored images. If so, you might need to convert it to black-and-white image before processing (unless you want to do colored image processing which will be covered later).

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 2/6

_____, _____
Last Name,

_____ , _____
First Name

[1] (20pts) Without using Matlab's histogram match/equalization functions, use your own code and images provided below to implement following three histogram matching tasks:

- Convert the Normal Exposed Image to an Over Exposed Image
- Convert the Over Exposed Image to an Under Exposed Image
- Convert the Under Exposed Image to a Normal Exposed Image

Three Images used in this assignment:

Normal Exposed:



Over Exposed:



Under Exposed:

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 3/6

_____, _____
Last Name,

First Name



You need to turn in three images you created and your program. The resulting images should be black-and-white image. Therefore convert these colored images to black-and-white images first.

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 4/6

_____, _____
Last Name,

First Name

2. (20pts) Use (1) Unsharp masking and (2) Laplace filter to enhance the image below.



Notice that each enhancement needs to be completed by ONLY one line as.

enhanced image=filter2(mask ,input image)

In other words, you will need to figure out the mask to enhance the image in one shot. The determination of mask must be done in your program. For Unsharp masking, you

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 5/6

_____, _____
Last Name,

_____ , _____
First Name

can use either 3X3 Gaussian or box lowpass filter kernel. For Laplace filter you can choose one of three Laplace operators covered in lecture.

You will need to turn in two enhanced images (one by Unsharp masking and one by Laplace filter) and your program. The resulting images should be black-and-white images. Therefore if the provided image is a colored image, convert it to a black-and-white image first.

Midterm Exam 1 (Programming Part)

October 2, 2019

Page 6/6

_____, _____
Last Name,

First Name

3. (20pts) Download the image below



Covert it to a black-and-white image. Then, without using Matlab's transformation function, use your own program to perform following transformation in order

1. Translate to left by 100 pixel to top by 50 pixel
2. Shrink image in x direction by 20% and enlarge image in y direction by 20%
3. Using the image center as the axis, rotate the image clockwise by 120 degree

Turn in the resulting image and your program

Note (1) Use ONE matrix to implement the all of above transformations combined (2) the output image should have the same size as the original image and (0, 0) is always the center, and (3) if you need to fill the background color to some pixels use the same background color of the original image.