Lesson Quiz

Answer the following questions to test your knowledge of the concepts and techniques taught in this lesson.

Note: Some of the questions are based on the lab associated with this lesson , so make sure you have explored and run the lab.

Question 1

1.0/1.0 point (graded)

What name is given to the unsupervised method of dynamic thresholding; algorithmically determining the value of *T*, the fixed constant used to separate the intensities of an image into categories.

- Manual Thresholding
- Method of Euclid
- Otsu's Method ✔

Explanation

Wikipedia: *In computer vision and image processing, Otsu's method, named after Nobuyuki Otsu (大津展之 Ōtsu Nobuyuki), is used to automatically perform clustering-based image thresholding, [1] or, the reduction of a graylevel image to a binary image.*

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Answers are displayed within the problem

Question 2

1.0/1.0 point (graded)

Which of the following best describes a histogram?

- A transformation of the image into the frequency domain
- A representation of an image as a height map
- A representation of the totals of the number of times each grayscale value is seen in an image ✔
- A summation of all the red pixels in an image

Explanation
Transforming the image into the frequency domain is a completely different technique. Representing as a height map is a Topogram. The summation of all red pixels has no meaning in this context.

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Question 3

1.0/1.0 point (graded)

Which of the following criteria in the histogram of an image makes it a good candidate for thresholding?

- Objects in the image are blended with the background
- Objects are clearly grouped, the background is clearly grouped and there is a distinct difference between them ✔
- There is a fuzzy threshold

Explanation
You want simple object that translates in the histogram to a clear cluster of object colors or grayscale values, a simple background that also translates to a clear cluster of values and ideally a gap between them. With the other two answers, the histogram is telling us that the property we're looking at (for example grayscale intensity) in the object of interest is mixed with the background. That's not ideal to see for thresholding.

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Answers are displayed within the problem

Question 4

1/1 point (graded)

The following is a question based on the lab in this lesson. In this lab, as part of using Otsu's Method, you were asked to use OpenCV's thresholding function. Which of these lines is correct?

- a. `otsu = cv2.threshold(gradient, 0, 255, cv2.THRESH_BINARY|cv2.THRESH_OTSU)[1]` ✔
- b. `otsu - cv2.threshold(gradient, 0, 255, cv2.TRESH_BINARY)[1]`

c.
```
otsu = cv2.threshold(gradient, 127, 255, cv2.THRESH_BINARY|cv2.THRESH_OTSU)[1]
```

d.
```
gradient = cv2.threshold(gradient, 0, 255, cv2.THRESH_BINARY|cv2.THRESH_OTSU)[1]
```

Explanation
a. is correct. It specifies binary and Otsu, gives the correct range (0 .. 255) and places the result in a matrix named 'otsu'.
b. simply omits the 'otsu' parameter.
c. incorrectly sets the range over which Otsu will work to the upper half of the histogram.
d. simply places the result in the wrong variable.

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Answers are displayed within the problem

Question 5

1/1 point (graded)

The following is a question based on the lab in this lesson. In the lab, you were asked to call OpenCV's erode function. Which of these lines would you expect to work best?

a. `eroded = cv2.erode(close, None, iterations=60)`

b. `eroded = cv2.erode(closingKernel, None, iterations=6)`

c. `eroded = cv2.erode(close, None, iterations=1)`

d. `eroded = cv2.erode(close, None, iterations=6)` ✔

Explanation

d. is correct.
b simply called with the wrong matrix as first argument.
c. has too few iterations of the erosion operation and is ineffective.
a. has far too many iterations of the erosion kernel and will probably erode the entire image.

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Answers are displayed within the problem

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