배우기

# computer-vision

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f : R² ⊃ Ω → R
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f Ω : Rectangular image domain

StackOverflow 2 .

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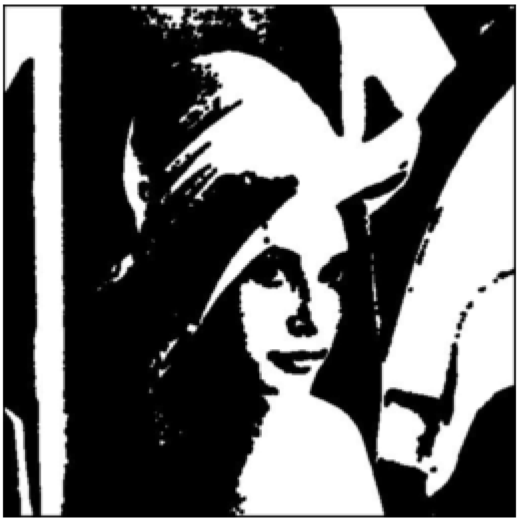
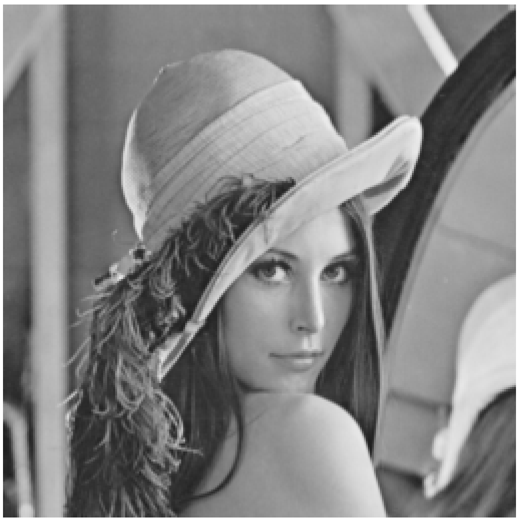


. (. . Lena, Image Processing world)

: . 1 1 , 0 255 . , 40 . 0 1 0 255)



: , , . . 2 . RGB (Red-Green-Blue) . , 3 (. 2D). , 0 - 255 ( ), 0 - 255 ( ), 0 - 255 ( ) . {0,0,0} {255,255,255} , {255,0,0} , {255, 255, 0} . .

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1. : https://en.wikipedia.org/wiki/Sampling_(signal_processing)

2. : RC Gonzalez, RE Woods : . 3 , Pearson Prentice Hall, Upper Saddle River, 2008.

3. ( ) : R. Szeliski : : . , , 2010.

4. , , : https://en.wikipedia.org/wiki/Grayscale

Examples

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Python 2 . . , . .

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, . OpenCV . . 'pip' . ,

PyPNG .

PyPNG pip

Linux / Mac Windows

ipython github .

https://github.com/Skorkmaz88/compvis101

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Python , . . PNG .

Github .

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git clone https://github.com/Skorkmaz88/compvis101
```

. tutorial0.py readingImages.ipynb ipython . .

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```
 # libs
import png

# We create a greyscale image as described in our text.
# To do that simply, we create a 2D array in python.
# x and y, x being horizontal and y being vertical directions.

x  = []
y = []
# Play around with these pixels values to get different grayscale images, they shoud be
# in range of 0 - 255.
white = 255
gray = 128
black = 0
width  = 100
height = 300

# Add 100 x 100 rectangle as just white(255) valued pixels
for i in range(0, 100):
    for j in range(0,100):
        y.append(white); # Pixel (i,j) is being set to a value, rest is coding trick to nest
two lists
    x.append(y)
    y = []

# Add 100 x 100 rectangle as just mid-gray(128) valued pixels
for i in range(0, 100):
    for j in range(0,100):
        y.append(gray);
    x.append(y)
    y = []

# Add 100 x 100 rectangle as just black(0) valued pixels
for i in range(0, 100):
    for j in range(0,100):
        y.append(black);
    x.append(y)
    y = []

# output image file
f = open('out.png', 'wb')
w = png.Writer(width, height , greyscale=True, bitdepth=8)
w.write(f, x)
f.close()
# If everything went well, you should have 3 vertically aligned rectangles white, gray and
black
# Check your working folder

# PART 2
# Read a grayscale image and convert it to binary
# This time we will binarize a grayscale image, to do that we will read pixels and according
to threshold we set
# we will decide if that pixel should be white or black

# This file is originally 8 bit png image, can be found in github repository, you should use
only this type of
# images if you want to change the image.
f = open('./img/lenaG.png', 'r')

r=png.Reader(file=f)
# You will the details about the image, for now pay attention to size and bitdepth only.
img = r.read()

width = img[0]
height = img[1]
# Threshold value for binarizing images,
threshold = 128
print "Input image size is: "+ str(width)+ " pixels as  width, " + str(height) + " pixels as
height"

f_out = open('lenaBinary.png', 'wb')
w = png.Writer(width, height , greyscale=True, bitdepth=1)

pixels = img[2]

x = []
y = []

# Let's traverse the Lena image
for row in pixels:
    for pixel in row:
        p_value =  pixel
        # Now here we binarize image in pixel level
        if p_value > threshold:
            p_value = 1
        else:
            p_value = 0

        y.append(p_value);
    x.append(y)
    y = []

w.write(f_out, x)
f_out.close()
```

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S. No	□□	Contributors
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