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1  ## PS3-1 Image Improvement via area-to-pixel filers
2  import cv2
3  import numpy as np
4  import os
5
6  # User input feature
7  user_input = input("Please name your input color
   file: ")
8  file_directory = os.getcwd()
9  image_location = os.path.join(file_directory,
   user_input)
10 if os.path.exists(image_location):
11     print(f"Your '{user_input}' image loaded
   successfully.")
12     input_image = cv2.imread(user_input)
13     cv2.imshow(f"'{user_input}'", input_image)
14     cv2.waitKey(0)
15 else:
16     print(f"Error: unable to load your input image.
   \nPlease make sure '{user_input}' is in the correct
   directory.")
17     exit()
18
19 # Filtering process
20 input_image = cv2.imread(user_input)
21 # Different filtering combination for rainbow (
   bilateral+sharpening)
22 if user_input == 'rainbow.png':
23     # smoothed_image = cv2.GaussianBlur(input_image
   , (5, 5), 0)
24     smoothed_image = cv2.bilateralFilter(
   input_image, d=9, sigmaColor=75, sigmaSpace=75)
25     kernel = 1
26     sharpening_kernel = kernel * np.array([[-1, -1
   , -1], [-1, 9, -1], [-1, -1, -1]])
27     sharpened_image = cv2.filter2D(smoothed_image
   , -1, sharpening_kernel)
28
29 # Different filtering combination for all other
   images (median+sharpening)
30 else:

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31     smoothed_image = cv2.medianBlur(input_image, 5)
32     kernel = 1
33     sharpening_kernel = kernel * np.array([[-1, -1
, -1], [-1, 9, -1], [-1, -1, -1]])
34     sharpened_image = cv2.filter2D(smoothed_image
, -1, sharpening_kernel)
35
36 # Saving the output image
37 cv2.imshow(f"{user_input}", sharpened_image)
38 output_image = user_input.split('.')[0] + '-
improved.' + user_input.split('.')[1]
39 cv2.waitKey(0)
40 cv2.imwrite(output_image, sharpened_image)
41
42 cv2.destroyAllWindows()
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