

Photo style

Objective:

Take a photo and then select a style to transform it into – Cartoon, sketch, painting. Write software to convert the image.

Theoretical Knowledge:

- **Background:**

Converting images into vector has been doing in past times through the use of various software's such as adobe Illustrator, Photoshop or applying filters on images.

- **Assistance by Python:**

With the help of python, developers have been able to convert images into vector form with the help of its own libraries which reduces the time taken in making a program and further makes things simpler.

- **CV2 Libraries:**

The CV2 library of python is responsible for handling i.e. reading and saving images while being on the command prompt.

- **Installing CV2:**

- Open the command prompt on your console
- Type in the “pip install open-cv python”
- Press enter and it will automatically download the library.

Procedure:

First, we import the cv2 library in our console to use built-in functions from this library with the help of the following line.

```
import cv2
```

- **Reading the image:**

Then we take a variable name image and store the read image in it with the help of the following line.

```
image = cv2.imread("CA.jpg")
```

- **Converting into Gray image:**

Then the read image is converted into gray one with the help of the following code.

```
grey_img = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)
```

- **Inverting the Gray image:**

After this the gray image is inverted by the use of the following code.

```
invert = cv2.bitwise_not(grey_img)
```

- **Blurring the inverted image:**

Once the image is inverted then this is blurred with the help of the following code.

```
blur = cv2.GaussianBlur(invert, (21,21),0)
```

- **Again inverting the blurred image:**

This blurred image is again inverted and is saved in the variable inverted blur which is as follow:

```
invertedblur = cv2.bitwise_not(blur)
```

- **Sketching the above image:**

Now we sketch the inverted blurred image by using the divide built-in function in library as shown below:

```
sketch = cv2.divide(grey_img, invertedblur, scale = 256.0)
```

- **Saving the sketched image:**

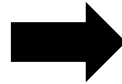
Finally the sketch image is written down or in other words saved by the “imwrite” function of the cv2 library.

```
cv2.imwrite("Sketch4.png",sketch)
```

Code:

```
8
9 import cv2
10
11 image = cv2.imread("CA.jpg")
12 grey_img = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)
13 invert = cv2.bitwise_not(grey_img)
14 blur = cv2.GaussianBlur(invert, (21,21),0)
15 invertedblur = cv2.bitwise_not(blur)
16 sketch = cv2.divide(grey_img, invertedblur, scale = 256.0)
17
18
19 cv2.imwrite("Sketch4.png",sketch)
20
```

Result:



Questions

Q1

Describe the user requirements of your system.

Answer

The program/software will run on anything even on a Raspberry Pi 1. As long as it can run windows or linux. The minimum RAM required is 1.9GB. You will need a GPU if you are using CMake, Moreover everything depends on your processing needs and which built in functions or algorithms you are using from the open cv2 library

Q2

State 3 functional requirements for your topic/system?

Answer

Following are the three functional requirements of this topic:

- *It provides a common infrastructure for computer vision applications*
- *It helps tracing the image in more efficient manner.*
- *It saves time.*

Q3

State 3 non-functional requirements for your topic/system?

Answer

Following are the three functional requirements of this topic:

- *It provides better service ability by being less complex*
- *It helps in increasing the capacity of the program to handle more data.*
- *It is more manageable.*

Q4

Discuss if your software is an embedded system.

Answer

The software applications in computers are controlled by operating systems similarly the embedded system software controls various devices and ensure their smooth functioning. My software is capable of connecting between various devices but the only requirement is that each device must have their cv2 library installed.

Q5

Demonstrate that you successfully tested for defects.

Answer

The one major drawback is that it does not traces out or scans the gradient parts of the image meaning the more complex the gradient is the more inefficient is the result of this program.