

Cartoonifying an image with the help of open cv and encryption/ decryption

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Abstract

The motive behind this paper is to give the solution regarding the conversion of images into cartoon forms. The previous ways and methods of image transformation needs very complicated computer graphics and excellent skills in programming. In this chapter we have produced a personalized cartoon image from an input image of our choice. This is a very good way as it doesn't require any advance programming skills plus the user interaction is very less. We also used the encryption and decryption concept before getting the final output. And some basic libraries which are used for more image processing system.

Keywords

Image Processing, Cartoon, Cartoonify, Generative Adversial Network (GAN), OpenCV

1. Introduction

Image cartoonification is held out in many steps. Cartoon images are fully man's creativity. And nowadays in animated movies and comics, we see 100+ cartoon forms of the normal images. Some of them are from our regular surroundings. But the task become really tedious for the team to convert every single image into cartoon form. So far as to the solution to this problem, we have created a program which convert image as well as videos in to a cartoon creation.

In early times the designing of the images comprises in specific range called "non-photorealistic rendering". It is the part of the computer graphics and it helps in the opening of more options of the style in the digital art. And by this program we not only convert the human images in to the cartoon but also those images which do not have faces.

2. Related work:



Recently, there had been a great development in the area of the GAN [2]. GAN model architecture is shown in figure [1]. GAN gains its importance in the year 2014, where it is represented in variety of different applications, for example deep learning. Some strategies are there which are investigated by the authors in the research article [3] particularly for picture synthesis like hierarchical technique, direct strategy, iterative method. For picture amalgamation they promoted 2 strategies, “image-to-image translation” and “text-to-image translation”.

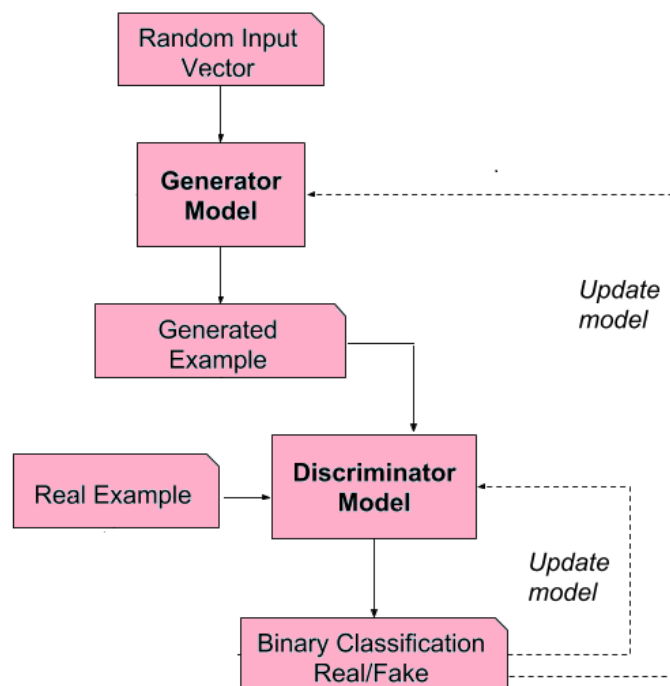


Figure 1.GAN model architecture

Currently coming to picture interpretation, they generate some wide concepts models from supervised to unsupervised mechanism that are pixel loss [3], and self-distance loss [4]. Not only this but they also proposed some image-image interpretation model for face and video changing.

We can also conclude from this that ten-picture interpretation is really a concise use of GAN which is really good for different applications. Many frameworks [5] which create cartoon image of the original image, centre them around low-level editing and control, devices for adaptable cartoon drawings. Inkwell [6] built up some compelling methods on abusing layers and permitting the control of movement capacities. The cartoon framework gave skeleton-driven components and help to re-use segment. Surprisingly out framework of code allow user to convert any image to convert it in cartoon form. We also used encryption and decryption just to add the security but that is already stored in this framework.

3. Proposed Method:

To make a cartoon image we gate a picture-based methodology. Since it is



really hard to get the standards of how craftsman sketches the cartoon image, we just use a non-parametric approach to get the final cartoon image of our input image.

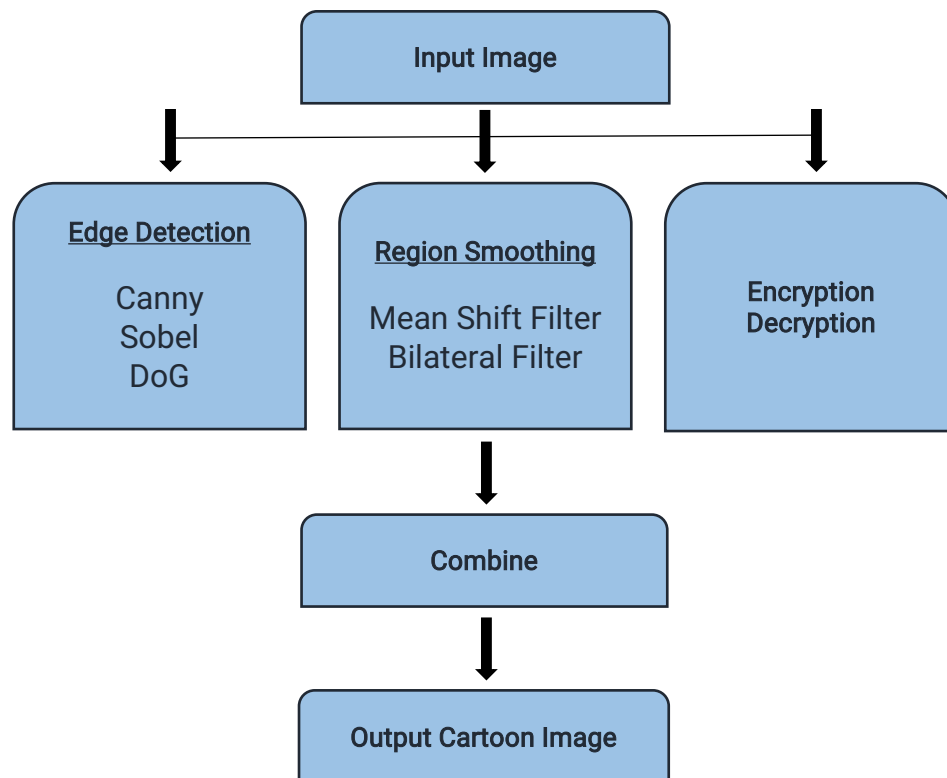


Figure 2. Proposed model for image transformation into cartoon

In this proposed model we are using Edge detection techniques, region smoothing filter, encryption [7] and decryption [8].

- Edge Detection- There are so many edge detection techniques present out there but for the image transformation we can probably use are Canny edge detection or Sobel edge detection or DOG (Difference of Gaussian). And when we apply any one of these techniques, we realise that the edges are enhanced, by seeing the output we can say that DOG performance is better than other two.
- Region Smoothening- By using this we are actually removing all the colour, shades and boundaries which can be considered as noise in the process of cartoonification of the input image. For region shifting we have mean shifting filter and bilateral filter. In case of mean shift filter the colour, regions are smoothened but the colour and features were still residing

there only which give the negative impact to the image hence we prefer bilateral filter over it.

- Encryption and Decryption: We are doing encryption and decryption for providing security to the user. So, in earlier steps only we store the key. The output we get after decrypting is in grayscale as encryption and decryption are only performed in grayscale images.
- Combine: After doing Edge detection, region smoothening and encryption-decryption we compile all these and get the final output.

4. Implementation and Experimental Result

Computer vision maybe is the stuffy area in Artificial Intelligence with a wide array of uses that pre-owns python. Python is a group of libraries. It has numerous libraries for authentic applications. One such library is Open CV [9]. Open CV is the most famous library used in computer visions with so much fascinating stuff. Open CV is a cross platform library that assimilates application like video and picture taking and producing media. It is uncomplicated and actualizes by everybody. It is importantly used in image conversion, face recognition, object detection, and numerous other shocking applications. We will follow the following steps in this article to convert the image to cartoon.

- Ship in library
- Studying Input Image
- Detecting edges in the image-

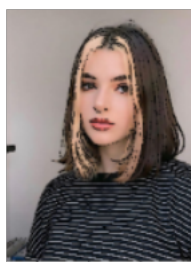
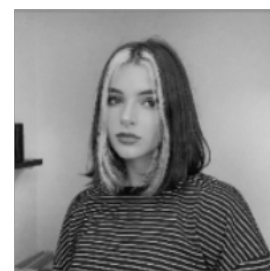
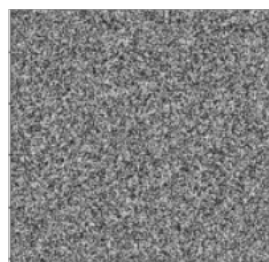
Here we will detect the edges in the image utilizing versatile thresholding strategies.

- Cartoonifying the image-

In this progression, we will be cartoonifying the image by utilizing bilateral filter method.

- **Final Output –**

At last, we will visualize the final output as cartoon image



(a) Input image (b) BGR to RGB (c) Edge detection (d) Encrypted Image (e) Decrypted Image (f) Output cartoon image

Figure 3. Experimental results

5. Conclusion

In this article we here, are bringing an orderly way of converting image into cartoon. This set up will outline a customized animated image from the mentioned image using edge detection and region smoothening, we have come up with a set up for an image transformation to cartoon. The setup applies to OpenCV. The presented setup is simple to use for the general public. When absolute eloquent cartoon image is built, it may be simulated with the animation supervisor and vitalize the speech driven animator. Our structure can be used in the array of utilities, for e.g., online visiting plus customized e-cards.

The preference of edge detection procedure region smoothening refining may be improvised in forthcoming future. Colour distance and spatial radius might be a determining an element for the image conversion to cartoon.

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