CARTOONIFY AN IMAGE USING PYTHON AND OPEN CV

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ABSTRACT: -

In this paper, we propose a solution to transforming photos of real-world scenes into cartoon style images, which is valuable and challenging in computer vision and computer graphics. Our solution belongs to learning based methods, which have recently become popular to stylize images in artistic forms such as painting. However, existing methods do not produce satisfactory results for cartoonization, since (1) cartoon styles have unique characteristics with high level simplification and abstraction, and (2) cartoon images tend to have clear edges, smooth color shading and simple textures, which exhibit significant challenges for texture-descriptor-based loss functions used in existing methods. In this paper, we propose Cartoon GAN, a generative adversarial network (GAN) framework for cartoon stylization. Our method takes unpaired photos and cartoon images for training, which is easy to use. Two novel losses suitable for cartoonization are proposed: (1) a semantic content loss, which is formulated as a sparse regularization in the high-level feature maps of the VGG network to cope with substantial style variation between photos and cartoons, and (2) an edge-promoting adversarial loss for preserving clear edges. We further introduce an initialization phase, to improve the convergence of the network to the target manifold. Our method is also much more efficient to train than existing methods. Experimental results show that our method can generate high-quality cartoon images from real-world photos (I.e., following specific artists' styles and with clear edges and smooth shading) and outperforms state-of-the-art methods

Introduction: -

Cartoons are an artistic form widely used in our daily life. In addition to artistic interests, their applications range from publication in printed media to storytelling for children's education. Like other forms of artworks, many famous cartoon images were created based on real-world scenes social media is extensively used these days. And standing out in this online crowd has always been a to-do on every user's list on these social media platforms. Be it images, blog posts, artwork, tweets, memes, opinions and what not being used to seek attention of followers or friends to create influence or to connect with them on such social platforms. We aim to provide one such creative solution to their needs, which is applying cartoon like effects to their images. Users can later share these images on any social media platforms, messengers, keep it for themselves, share it with loved ones or do whatever they like with it. Nowadays everyone is registered in social networks. We keep online status updated every day, share photos and comments, follow our friends' news. To have a nice profile is a matter of prestige. You can use a photo of

your own in a profile image, create an amusing avatar or turn your photo into a cartoon. With a pool of web applications available online, an image conversion to cartoon takes few clicks.

Need of Project: -

Creating a cartoon like effect is time and space consuming. Existing solutions to provide cartoon like effect to images are complex. Some solutions involve installing complex photo editing software like photoshop and other involve performing some tasks by user. Our research shows a website to carry out the task of Applying effects is more suitable, space efficient and takes minimum user efforts, for example toony photos is an existing website to perform such task but it is difficult to use as user has to markdown points & lines on the image to apply effects which is not user friendly also the options are limited. Hence there is a dire need for a website which is user friendly and performs the task of applying effects to images very well.

Methodology: -

The method consists of the following steps:

Image Resizing: The first step is to resize the image to a smaller size, which makes the processing faster and reduces the noise in the image.

Edge Detection: The next step is to detect the edges in the image. This is done using a popular edge detection algorithm called the Canny edge detector.

Color Quantization: The edges in the image are then quantized to a fixed number of colors using the K-means clustering algorithm.

Smoothing: Finally, the image is smoothed using a Gaussian filter to reduce the noise and to produce a more visually appealing result.

Masking: In this process the edge retrieved image is overlayed upon smoothened image, after merging both image we finally got the cartoon image.

Literature Survey: -

In the 1930s, the first animated cartoons began to appear on movie screens, thanks to advances in technology that allowed for the creation of hand-drawn animations. These cartoons, such as the iconic characters created by Walt Disney, introduced a new level of realism and detail to animated characters, and helped to popularize the art form.

In the 1960s and 1970s, the rise of computer graphics technology brought about a new era of cartooning. Early computer graphics programs allowed artists to create simple, vector-based images that could be easily manipulated and animated. This led to the development of more sophisticated computer animation

tools, such as Pixar's Renderman software, which was used to create the groundbreaking film Toy Story in 1995.

As computer graphics technology continued to advance, it became possible to apply cartoon-style effects to real-world images using digital processing techniques. Today, there are many software programs and apps that can be used to cartoonify an image, from simple filters that apply a hand-drawn look to sophisticated machine learning algorithms that can analyze an image and generate a cartoon-style version of it.

Sample Output: -

Comparative Result: -

There are many different methods for cartoonifying an image, and the comparative results can vary depending on the specific techniques and parameters used. However, here are some general observations on the comparative results of different cartoonifying methods:

1. Neural networks-based methods: Deep learning-based methods, such as those that use convolutional neural networks (CNNs) or generative adversarial networks (GANs), have shown to produce high-quality cartoon-style images. These methods can learn the underlying patterns and features of real and cartoon images and generate highly realistic and detailed cartoon images.
2. Image filtering methods: Simple image filtering techniques, such as edge detection or color quantization, can also be used to achieve a cartoon-style effect. These methods are less computationally intensive than neural network-based methods, but may produce less realistic results with more distortion.
3. Style transfer methods: Style transfer algorithms, such as those that use neural style transfer, can also be used to cartoonify an image. These methods work by transferring the style of a cartoon image to a real image, resulting in a cartoon-style effect. However, the results of style transfer methods may be less consistent than neural network-based methods, and may require more fine-tuning and experimentation to achieve the desired effect.

Overall, the comparative results of cartoonifying an image can depend on a variety of factors, including the specific methods used, the parameters and settings used, and the quality of the original image. However, deep learning-based methods have shown to produce some of the most realistic and high-quality cartoon-style images.

Conclusion: -

In conclusion, cartoonifying an image is a process that involves transforming a real-world image into a cartoon-style image. There are many different methods and techniques that can be used to achieve this effect, ranging from simple filtering techniques to more advanced deep learning algorithms.

However, there are also other factors to consider when cartoonifying an image, such as the specific techniques used, the parameters and settings used, and the quality of the original image. In some cases, simpler techniques such as image filtering or style transfer may be more appropriate, depending on the desired effect and the resources available.

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