WHITE BOX CARTOONIZATION USING AN EXTENDED GAN FRAMEWORK

ABSTRACT

We propose to implement a new framework for estimating generative models via an adversarial process to extend existing GAN framework and develop a white-box controllable image cartoonization, which can generate high-quality cartoonized images from real-world photos. Images are decomposed into three cartoon representations: the surface representation, the structure representation, and the texture representation. Corresponding image processing modules are used to extract three representations for network training, and output styles could be controlled by adjusting the weight of each representation in the loss function. We propose to separately identify three white-box representations from images: the surface representation that contains a smooth surface of cartoon images, the structure representation that refers to the sparse colour-blocks and flatten global content in the celluloid style workflow, and the texture representation that reflects high-frequency texture, contours, and details in cartoon images. The learning objectives of our method are separately based on each extracted representations, making our framework controllable and adjustable. The project demonstrates the potential of the framework through qualitative and quantitative evaluation of the generated samples. This project will be based on the model proposed by Xinrui Wang and Jinze Yu - Learning to Cartoonize Using White-Box Cartoon Representations.
(https://www.researchgate.net/publication/343457093_Learning_to_Cartoonize_Using_White-Box_Cartoon_Representations)

PURPOSE AND MOTIVATION

The main objective of this project is to develop modern cartoon animation workflows which allow artists to use a variety of sources to create content. A cartoon is a popular art form that has been widely applied in diverse scenes. Some famous products have been created by turning real-world photography into usable cartoon scene materials, where the process is called image cartoonization.

The motivation to create this project has many sources:
- Interest to take in-depth knowledge of Generative Adversarial Networks (GANs) Framework.
- Interest to develop a good user-friendly model of image cartoonization.
- To increase our knowledge horizon in newly developed technologies like CartoonGAN - Tensorflow, W-B Catroonization.
- To gain good experience we will attempt to deploy it as a web app using HTML/CSS and Tensorflow.js.