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Project 3 write up

Introduction:

For my final project I decided to do a make cartoon application. It takes in an image and turns it into a cartoon form.

Input: 

Output:

It has 3 main methods, the main make cartoon method and two helper methods which are update_C which updates the centroids of the image until they don't change anymore and k_histogram which chooses the best K value and returns the centroids. Basically it can work on any image input, when calling there is an argument parser and you parse in an argument which is the file path of the image you want to alter and it outputs the altered image as output.jpg.

Workflow:

After typing in your input images path, the makecartoon method is called on it. The method starts by making an output in array form of the image and getting the images shape. In range of the c, it then uses the bilateral filter on output and sets it as output. I then use cv2's Canny method on output and output it to a variable called edge. The output is then converted to COLOR_RGB2HSV to get the histograms. A list of histograms is made as well as a list of centroids. The histograms that were found were appended to the histogram list are then used as input on the k_histogram method and those outputs appended to the centroids list. It uses a K-means algorithm to cluster the histogram of the image. Next we step through the z value and convert the pixels to new values using the centroid list as well as numpys argmin method. The output is then reshaped and color converted again. Finally, the contours are are found using cv2's findCountours method, and are then drawn on output using cv2's dawContours method. The output is then returned. This method produces desirable but varied results. Some imags have similar colors to the original and look like a realistic drawing while at other times the colors are completely off and it looks like a piece of modern art. However, you can always tell what the image was originally and the results are fun to see.

Emphasis:

The emphasis for this project was completely artistic. It was to generate a cool looking image and that's it. It is novel and fun to do and can perhaps produce output worthy of showing others but does not have much technical use.