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MP#4 - Histogram-based Skin Tone Detection

Description of Algorithm

_____The purpose of this algorithm is to identify and isolate any portions of an image that contains skin tones. The algorithm identifies skin tones using two different colorspace; HSV and RGB. First, the images are loaded and a GUI opens to allow the user to choose which part of the images they want to use as the skin tone sample. The images and their associated samples are then fed to a skin detection function (one function for each colorspace method).

Inside the functions, the images are converted to their working colorspace if necessary. A histogram is then calculated for the sample image (for hue values in HSV; red, green, and blue values for RGB). From these histogram values, the maximum and minimums of the values of interest are extracted. This essentially defines the threshold ranges for what is going to be considered “skin tone.” The function then iterates through the image and compares each pixel value to the skin tone thresholds. If the pixel is within the threshold, it remains untouched. If the pixel is outside of the threshold, it is set to be black in color. The results are then plotted for each colorspace method.

Results and Analysis

The results of the code are displayed in two figures; one per colorspace method. Each figure contains four subplots for each of the three test images. For each image, the original image itself, the skin tone sample taken from it, the sample image’s histogram, and the resulting edited image are display. The HSV method proved to be rather effective, resulting in nearly all of the

non-skin-tone pixels being removed. The RGB method did not run as smoothly and resulted in edited images that retained a number of non-skin-tones.

