MP#4 Report

- **Target:**

The purpose of this MP is to implement the skin color segmentation based on H-S hisotogram.

- **Technique:**

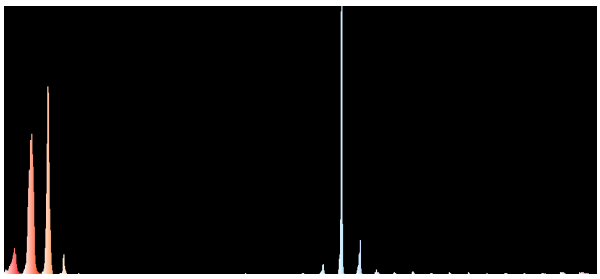
I use C++ with the OpenCV library to solve this problem. I use one data structure called IplImage to store the data of picture.

- **Algorithm description:**

To begin with, I download a picture of hand skin from the Internet. And I use cvGetReal2D(img, i, j) method to get the RGB value of every pixel from the original picture. Then I use the transforming formula in the lecture to transform the RGB value into HSV value. And I use cvCreateHist() method to establish a 2D histogram of H and S value. The range of H is 0-180, and the range of S is 0-255. From the H-S histogram, I can easily get the index of the max value, which indicates that range of color appears in the picture frequently. According to the sample picture, the H value ranges from 0 to 25. After that, I get the HS from the testing picture. During that process, after getting the HS value of each pixel, I will compare it with the range got from the histogram. If it is in that range, do nothing. Otherwise, I will use cvSet2D() to set the value of RGB to 0. As a result, I can segment the skin color from the picture.

- **Result:**

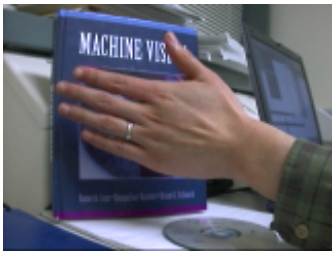
The sample picture



The H-S histogram of the sample picture

Testing picture 1

After segmentation



Testing picture 2

After segmentation

Testing picture 3 After segmentation

- **Result Analyze:**

Due to I used the range of HS value of skin color from the histogram instead of one specific value to threshold, so there are small noisy spots in the result picture. Also the edge of the hand is not smooth. These small spots are close to the skin color. If you watch carefully, u can find that the segmentation works better if the background is dark or its color has great contrast to the skin color.