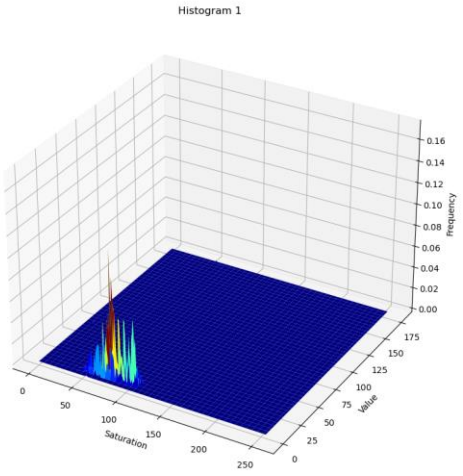
The purpose of this MP is to implement color based segmentation with application to flesh tone (skin color) detection.

I first collect flesh tone training data. I used a total 9 pictures of people's skin. Then, I try to select a good color space. I think HSV is the best. Next, I train a color histogram-based flesh tone detector. I construct a 2D color histogram based on the color pixels I have collected and normalize it. Here is the picture of the histogram.



Last, find the skin regions in test images. For each pixel of the test image, find its H and S components and use this (H,S) value to index the 2D histogram. Then, use threshold 0.0001. If the histogram (H,S) is larger than the threshold, this is a skin pixel. Last, maintain all skin pixels and change the rest to black.

The result pictures are pretty good, you are able to confidently say there is a human hand in the picture. There is still some noise exist on those pictures, add more training images may help solve this problem.