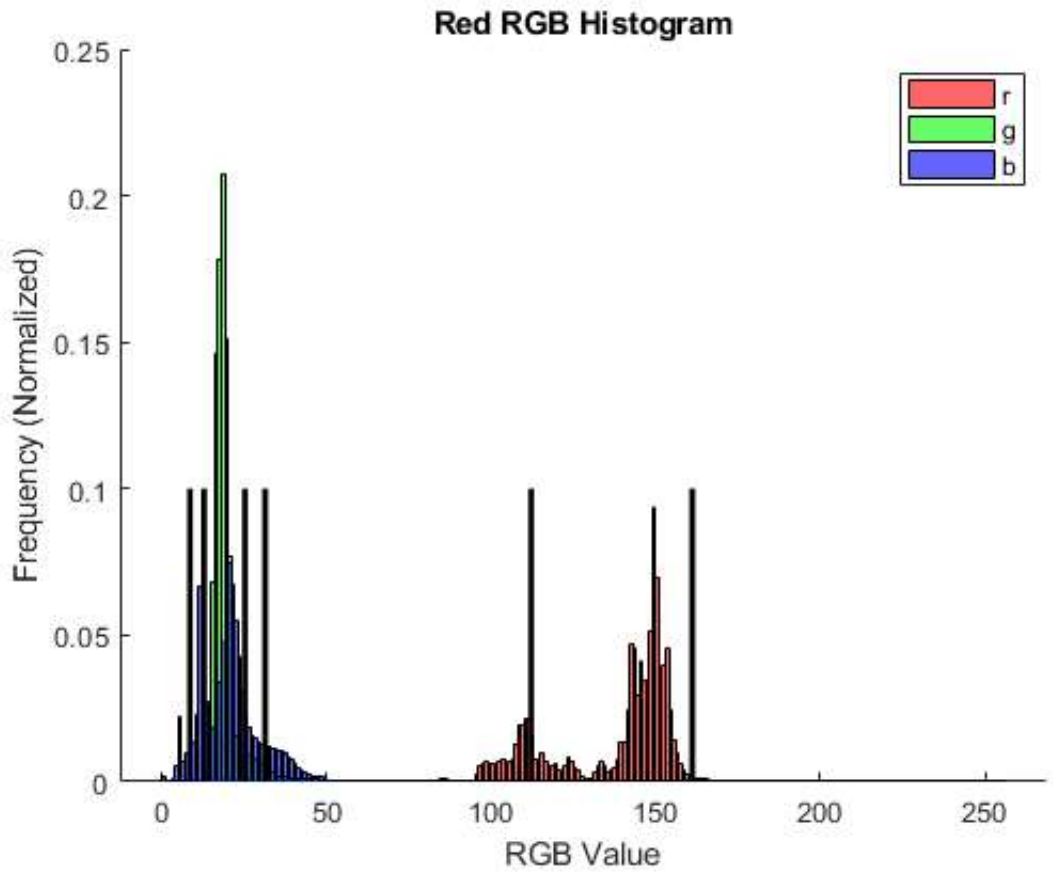
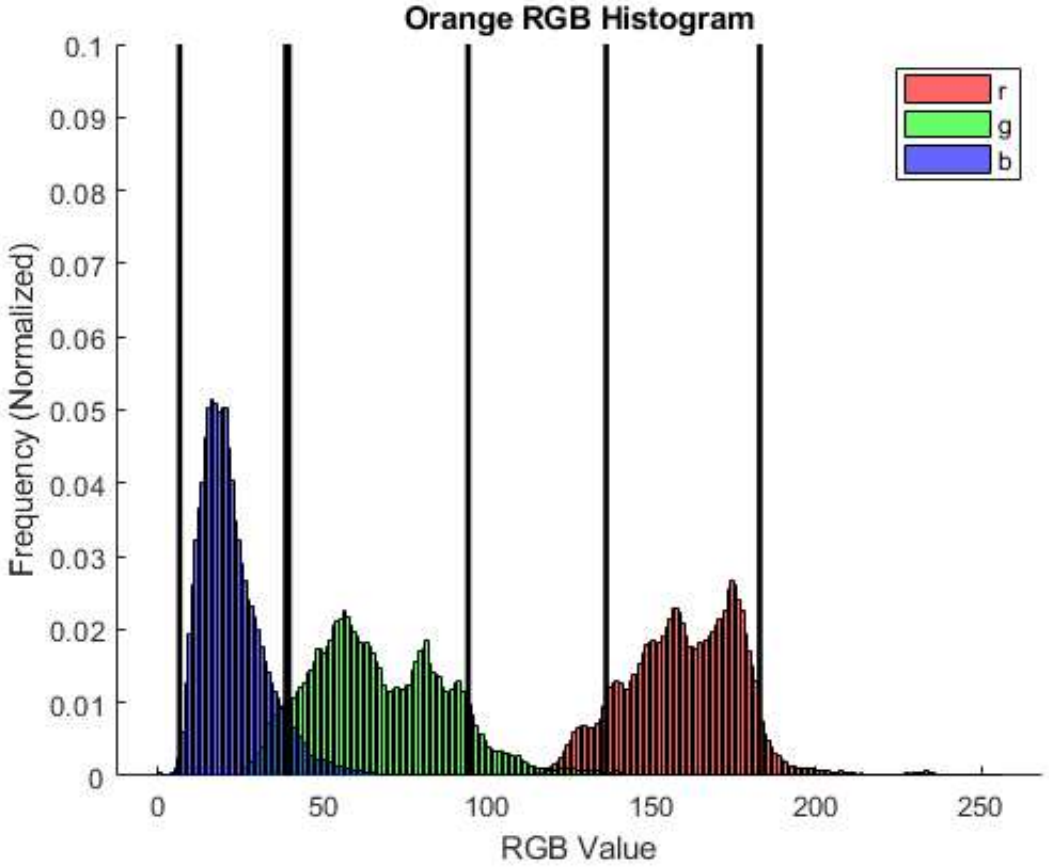
```
clear
close all;
clc

%%%%%%%%%%%%%%%%%%%% VERSION 3 %%%%%%%%%%%%%%%%%%%%

%Variables
color = ["Red" "Orange" "Yellow" "Green" "Blue" "Purple" "Black" "Noise"];
mult = 1.3;
fprintf('Results from Analysis with +/- %.2f SD\n',mult);
fprintf('_____________________________________________________\n');
fprintf('Color\tR_low\tR_high\tG_low\tG_high\tB_low\tB_high\n');

for i = 1:length(color)
    %Variables
    clear R_Total G_Total B_Total
    R_Total = zeros(1,256);
    G_Total = zeros(1,256);
    B_Total = zeros(1,256);

    for j = 1:5
        %Variables
        chr = convertStringsToChars(color(i));
        str = strcat(chr,int2str(j),'.jpg');
        Data = imread(str);
        R = Data(:,:,1);
        G = Data(:,:,2);
        B = Data(:,:,3);
        line = [0 0.1];

        %Totalling
        R_Total = [R_Total R(:)'];
        G_Total = [G_Total G(:)'];
        B_Total = [B_Total B(:)'];
    end

    %Total Mean & SD
    r_mean = mean(R_Total);
    g_mean = mean(G_Total);
    b_mean = mean(B_Total);
    r_sd = std2(R_Total);
    g_sd = std2(G_Total);
    b_sd = std2(B_Total);

    %RGB High & Low Values
    %(based on 2 SD)
    r_high = r_mean + mult*r_sd;
    r_low = r_mean - mult*r_sd;
    g_high = g_mean + mult*g_sd;
    g_low = g_mean - mult*g_sd;
    b_high = b_mean + mult*b_sd;
    b_low = b_mean - mult*b_sd;
    fprintf('%s \t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\n',color(i),r_low,r_high,g_low,g_high,b_
low,b_high);
```

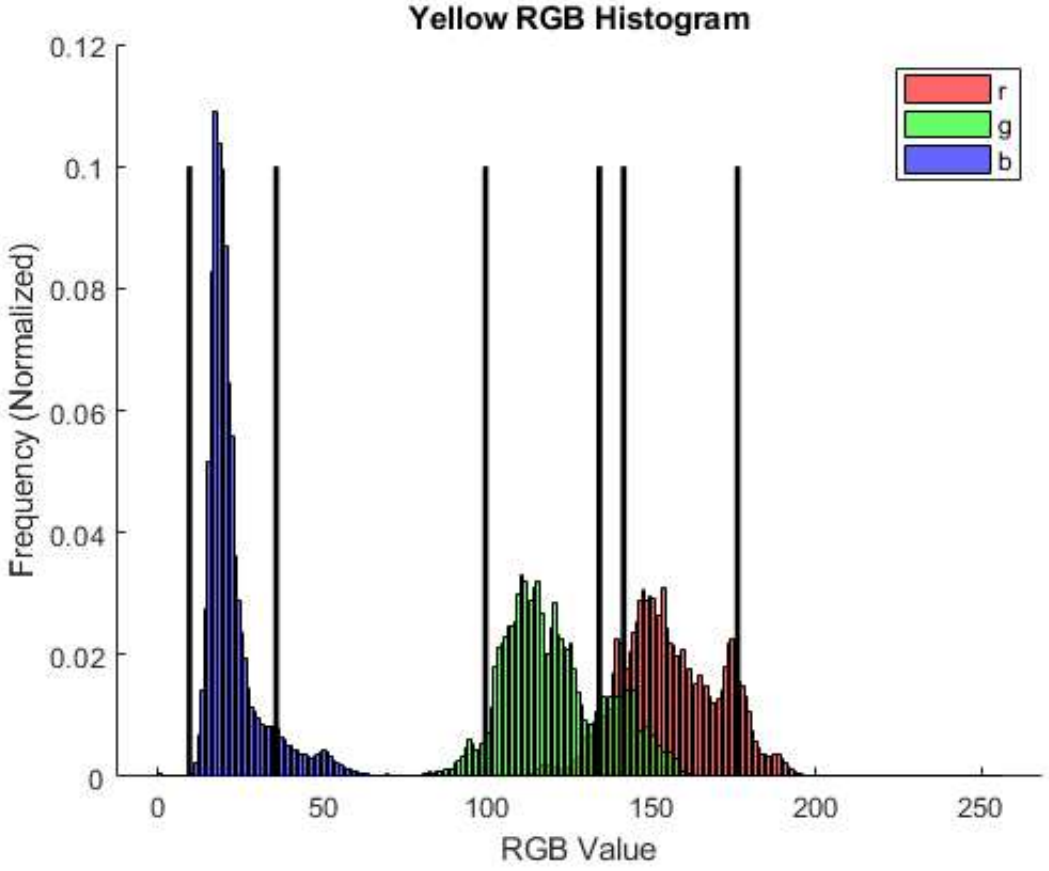
```
    %Display Results


    %Plot RGB Histogram
    figure(i);
    hold on;
    histogram(R_Total,0:1:256,'FaceColor','r','Normalization','probability');
    histogram(G_Total,0:1:256,'FaceColor','g','Normalization','probability');
    histogram(B_Total,0:1:256,'FaceColor','b','Normalization','probability');
    plot(r_low*ones(2,1),line,'color','k','linewidth',2); % r_low line
    plot(r_high*ones(2,1),line,'color','k','linewidth',2); % r_high line
    plot(g_low*ones(2,1),line,'color','k','linewidth',2); % g_low line
    plot(g_high*ones(2,1),line,'color','k','linewidth',2); % g_high line
    plot(b_low*ones(2,1),line,'color','k','linewidth',2); % b_low line
    plot(b_high*ones(2,1),line,'color','k','linewidth',2); % b_high line
    tit = strcat(color(i),' RGB Histogram');
    title(tit);
    xlabel('RGB Value');
    ylabel('Frequency (Normalized)');
    legend('r','g','b');

    %3D Plot Points
    x = [r_low r_high r_high r_low r_low; r_low r_high r_high r_low r_low];
    y = [g_low g_low g_high g_high g_low; g_low g_low g_high g_high g_low];
    z = [b_low*ones(1,size(x,2)); b_high*ones(1,size(x,2))];
    r_trip = r_mean/255;
    g_trip = g_mean/255;
    b_trip = b_mean/255;
    trip = [r_trip g_trip b_trip];

    %3D Plot
    figure(length(color)+1);
    Temp = surf(x, y, z, 'FaceColor', trip);
    hold on
    grid on
    patch(x', y', z', trip)
    xlabel('Red');
    ylabel('Green');
    zlabel('Blue');
    axis([-10 265 -10 265 -10 265]);
    view(-25, 30)

    figure(length(color)+2);
    hold on
    grid on
    plot3(R_Total, G_Total, B_Total, '.', 'Color', trip, 'MarkerSize', 2);
    xlabel('Red');
    ylabel('Green');
    zlabel('Blue');
    axis([-10 265 -10 265 -10 265]);
    view(-25, 30)
end
```

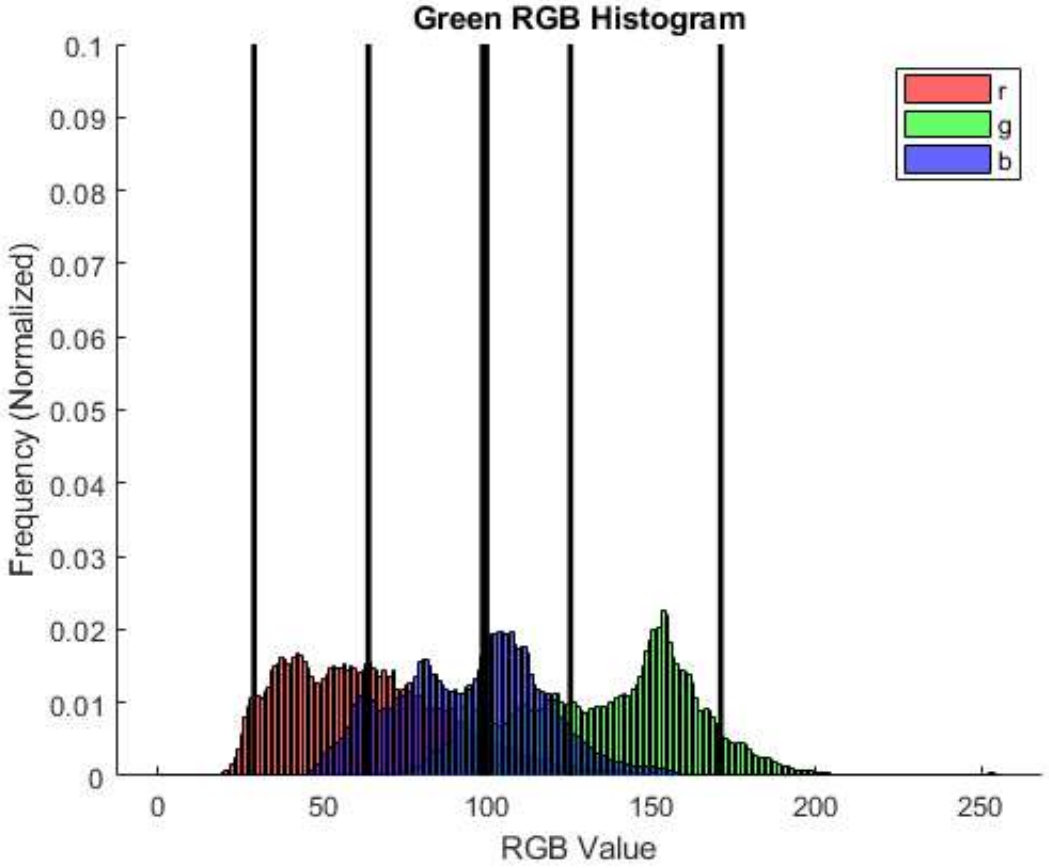
Results from Analysis with +/- 1.30 SD

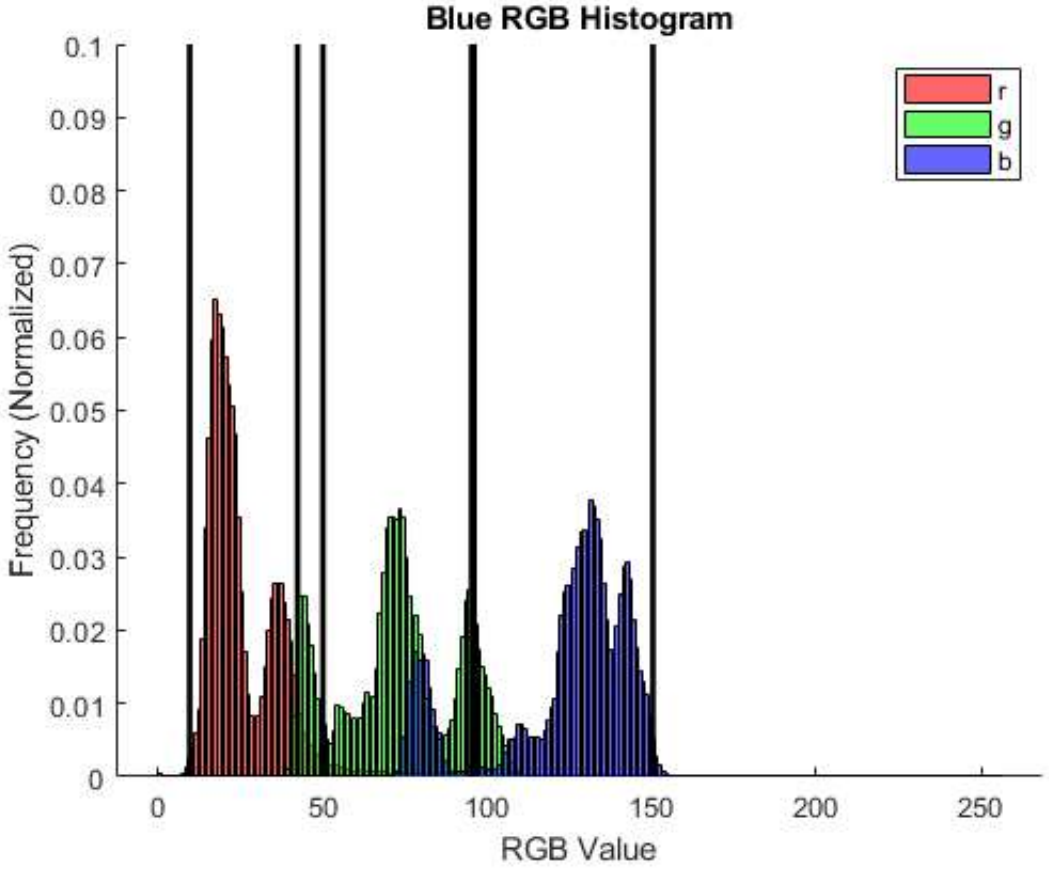
Color	R_low	R_high	G_low	G_high	B_low	B_high
Red	112.15	161.09	12.77	25.21	8.50	31.32
Orange	136.16	182.80	39.73	94.25	6.52	38.81
Yellow	134.08	176.05	99.51	141.46	9.55	35.89
Green	29.18	98.64	99.78	170.94	63.92	125.29
Blue	9.62	42.41	50.09	95.98	95.27	150.34
Purple	55.32	118.33	35.47	74.37	87.97	142.41
Black	16.97	72.27	18.96	81.11	24.20	86.29
Noise	-0.72	90.71	93.36	205.75	120.05	217.33

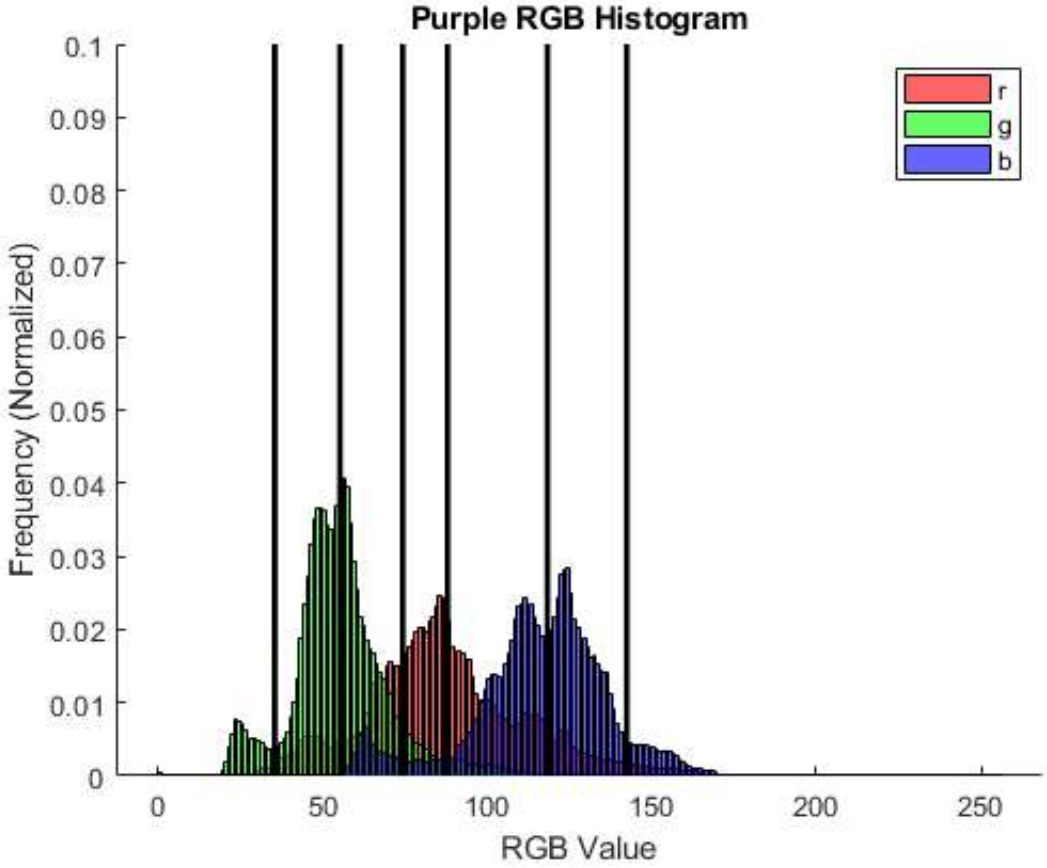


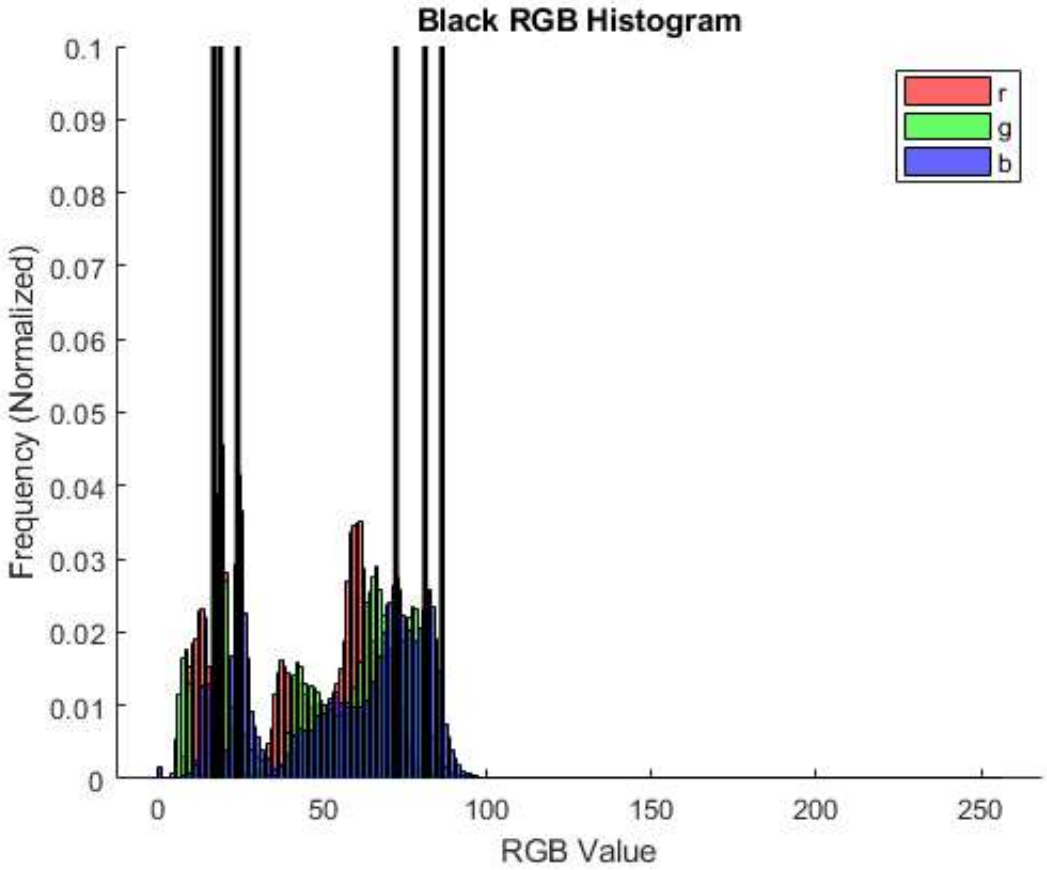

Orange RGB Histogram
Frequency (Normalized)
RGB Value
r
g
b
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0
50
100
150
200
250

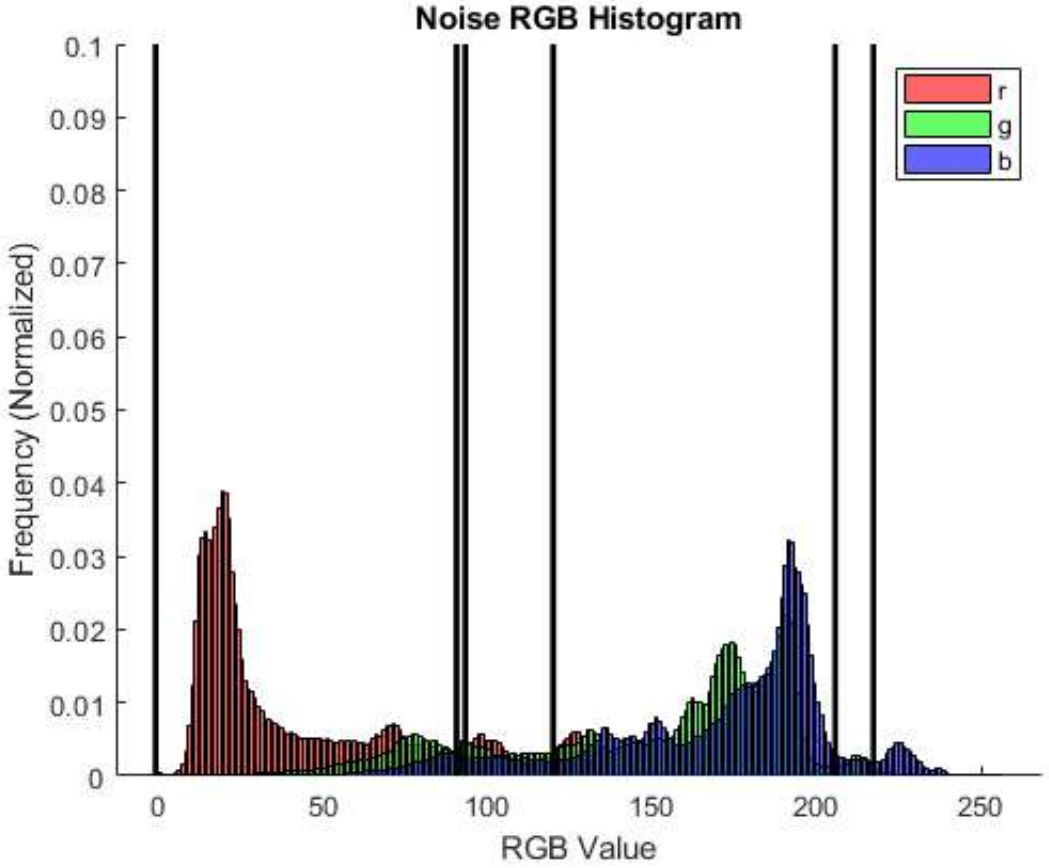

Yellow RGB Histogram
Frequency (Normalized)
RGB Value
r
g
b
0
0.02
0.04
0.06
0.08
0.1
0.12
0
50
100
150
200
250

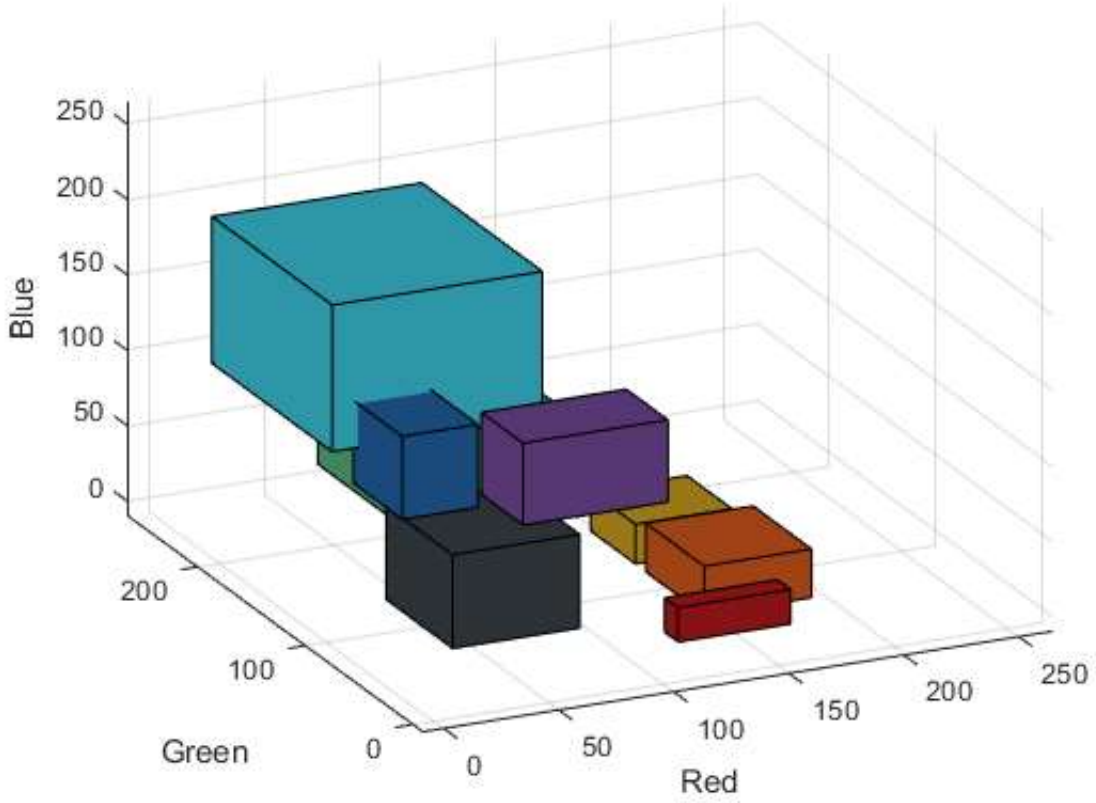

Green RGB Histogram
r
g
b
Frequency (Normalized)
RGB Value
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0
50
100
150
200
250

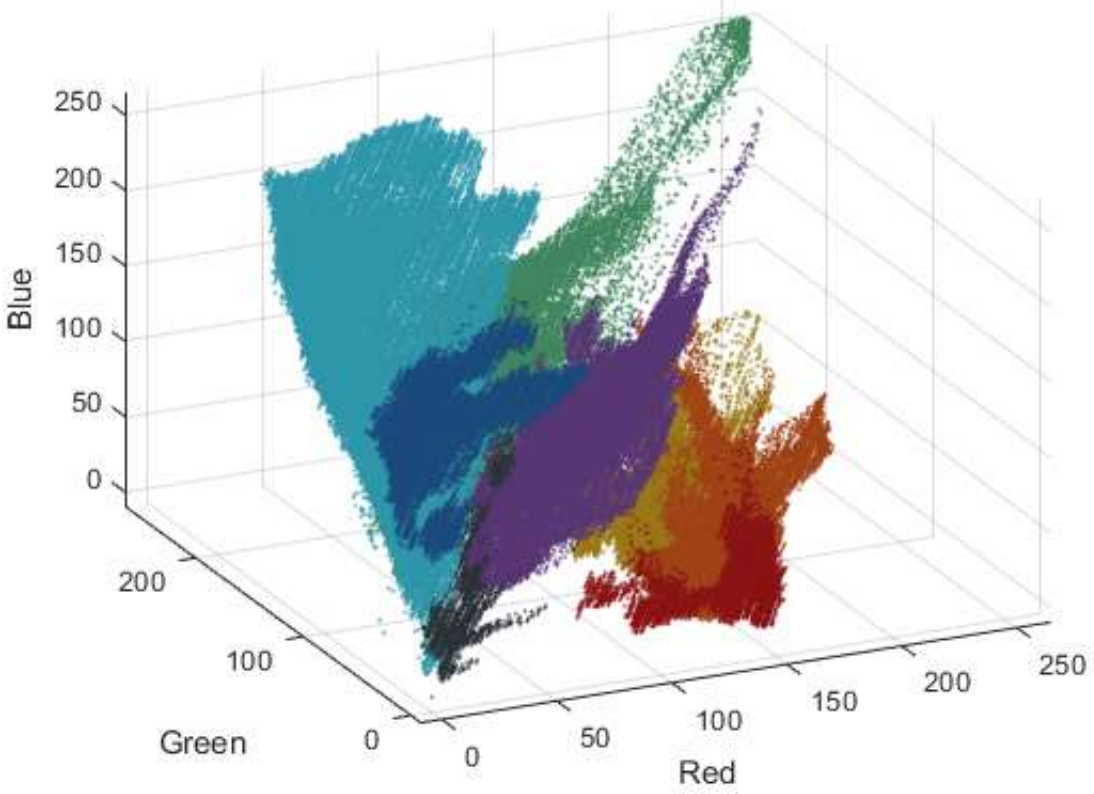

Blue RGB Histogram
r
g
b
Frequency (Normalized)
RGB Value
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0
50
100
150
200
250


Purple RGB Histogram
Frequency (Normalized)
RGB Value
r
g
b
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0
50
100
150
200
250


Black RGB Histogram
Frequency (Normalized)
RGB Value
r
g
b
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0
50
100
150
200
250


Noise RGB Histogram
Frequency (Normalized)
RGB Value
r
g
b
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
50
100
150
200
250


Blue
Green
Red
250
200
150
100
50
0
200
100
0
0
50
100
150
200
250



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