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LAB 9

Frequency Feature Extraction using MATLAB

1. Means of Red, Green and Blue.
2. Standard Deviation
3. Median
4. Maximum
5. Minimum

Importing shared dataset

```
mydir='/MATLAB Drive/Lab Excel/BirdsSet/Class-7';
fileformat='*.jpg';
dd=dir(fullfile(mydir,fileformat));
assert(numel(dd) > 0, 'No file was found. Check that the path is correct');
my_img = struct('img', cell(size(dd)));

for zz=1:numel(dd)
    my_img(zz).img = imread(fullfile(mydir,dd(zz).name));
end
```

CREATING A STRUCTURE FOR R COMPONENT

```
r_img = struct('img', cell(size(dd)));
for zz=1:numel(dd)
    r_img(zz).img = my_img(zz).img(:,:,1);
end
```

CREATING A STRUCTURE FOR G COMPONENT

```
g_img = struct('img', cell(size(dd)));
for zz=1:numel(dd)
    g_img(zz).img = my_img(zz).img(:,:,2);
end
```

CREATING A STRUCTURE FOR B COMPONENT

```
b_img = struct('img', cell(size(dd)));
for zz=1:numel(dd)
    r_img(zz).img = my_img(zz).img(:,:,3);
end
```

CREATING A STRUCTURE FOR GRAY SCALE VERSION

```
gray_img = struct('img', cell(size(dd)));
for zz=1:numel(dd)
    gray_img(zz).img = rgb2gray(my_img(zz).img);
end
```

CREATING A STRUCTURE FOR SHARPENED

```
edge_img = struct('img', cell(size(dd)));
for zz=1:numel(dd)
    edge_img(zz).img = fourrier(gray_img(zz).img,0.09,4);
end
```

CODE TO EXTRACT FEACTURES IN THE FREQUENCY DOMAIN AFTER APPLYING FFT

```
%Fast Fourier transform

%gray, red, green, blue
for i=1:numel(dd)
    current=gray_img(i).img;     %r_img(i).img g_img(i).img b_img(i).img

    %Fourier transform
    fft_img=fft2(current);

    %Statistical measures
    av=real(mean(mean(fft_img)));             % Avg
    med=real(median(median(fft_img)));        % Median
    st_dev=real(std(std(double(fft_img))));   % S.D
    max_=real(max(max(fft_img)));             % MAX
    min_=real(min(min(fft_img)));             % MIN

    %Column Values
    rgb=[av,med,st_dev,max_,min_];
    writematrix(rgb,'/MATLAB Drive/Lab Excel/Frequency Domain/Class3-FFT.csv','WriteMod
end
```

CODE TO EXTRACT FEACTURES IN THE FREQUENCY DOMAIN AFTER APPLYING DCT

```
%Discrete cosine transform

%gray, red, green, blue
for i=1:numel(dd)
    current=gray_img(i).img;    %r_img(i).img g_img(i).img b_img(i).img

    %DCT
    dct_img=dct2(current);
    dc=dct_img(1,1);
    writematrix(dc,'/MATLAB Drive/Lab Excel/Frequency Domain/Class3-DCT.csv','WriteMode
end
```

CODE TO EXTRACT FEACTURES IN THE FREQUENCY DOMAIN AFTER APPLYING WAVELET TRANSFORM

```
%wavelet
%gray
for i=1:numel(dd)
    current=gray_img(i).img; %r_img(i).img

    %WAVELET transform
    wave_img=wave(current,'haar',3);

    %Statistical measures
    av=real(mean(mean(wave_img)));             % Avg
    med=real(median(median(wave_img)));        % Median
    st_dev=real(std(std(double(wave_img))));   % S.D
    max_=real(max(max(wave_img)));             % MAX
    min_=real(min(min(wave_img)));             % MIN

    %Column Values
    rgb=[av,med,st_dev,max_,min_];
    writematrix(rgb,'/MATLAB Drive/Lab Excel/Frequency Domain/Class3-Wavelet.csv','Writ
end
```