



Sri Indu
College of Engineering & Technology
UGC Autonomous Institution
Recognized under 2(f) & 12(B) of UGC Act 1956,
NAAC, Approved by AICTE &
Permanently Affiliated to JNTUH



**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

**HANDS ON TRAINING COURSE
ON
IMAGE RETRIEVAL PROCESS USING
MATLAB**

STARTS ON February 13, 2021

Registration : Free

Course Duration : 4 Week

Weekend Course (Saturday)

Invited Participants: Third Year ECE, EEE, CSE

Restricted to 30 Participants/Slot

Resource Persons: In-house Trainers

**Coordinators
Dr.P.Epsiba**

**Convener
Prof.k.Ashok Babu**

**Principal
Dr.G.Suresh**

ATTENDANCE SHEET

S. No	Hall Ticket Number	NAME OF THE STUDENT	ATTENDANCE SHEET			
			Week 1	Week 2	Week 3	Week 4
1	18D41A04C5	Madduri Venkata Sameer Kumar	M/Sameer	M/Sameer	M/Sameer	M/Sameer
2	18D41A04P5	Madhavaram Sriram				
3	18D41A0447	D Anil Kumar				
4	19D41A0492	Koppula Rajitha	Anilkumar	Anilkumar	Anilkumar	← A →
5	18D41A04D3	Manda Sushma	Rajitha	Rajitha	Rajitha	Rajitha
6	18D41A04C1	Kunchala Venkatesh	Sushma	Sushma	Sushma	Sushma
7	18D41A04C5	Madduri Venkata Sameer Kumar	VENKATESH	VENKATESH	VENKATESH	VENKATESH
8	18D41A04M2	V. Lasya	Sameer Kumar	Sameer Kumar	Sameer Kumar	Sameer Kumar
9	18D41A04G1	Nimisha Reddy	Lasya	Lasya	Lasya	Lasya
10	18D41A04M2	Tatavarthy Satyadatha Praneeth	Nimisha	Nimisha	Nimisha	Nimisha
11	18D41A0439	C. Sai Hiranmayi	Praneeth	Praneeth	Praneeth	Praneeth
12	19D41A04C5	Vinisha	Sai	Sai	Sai	Sai
13	18D41A0468	Bharadwaja Enumula	Praneeth	Praneeth	Praneeth	Praneeth
14	18D41A0434	Bommidi Gayathri	Sai	Sai	Sai	Sai
15	18D41A0474	Gella Harini	Praneeth	Praneeth	Praneeth	Praneeth
16	18D41A04N5	Yerra Puneeshwar	Praneeth	Praneeth	Praneeth	Praneeth

18	18D41A04M1	Tangella Mallam Raju	Mallam Fejju	Mallam Fejju	Mallam Fejju	Mallam Fejju
19	18D41A04H7	R. Pranathi	R. Prabhay	P. Phanthi	P. Phanthi	P. Phanthi
20	19D41A0405	Aerraginnela Preethi	A. Preethi	A. Preethi	A. Preethi	A. Preethi
21	18D41A04N1	Velgapuri Sai Chander Rao				
22	18D45A0420	Salguti Nikitha	Nikitha	Nikitha	Nikitha	Nikitha
22	19D45A0406	Kolkulapally Bikku	K. Bikku	K. Bikku	K. Bikku	K. Bikku
23	19D41A0408	Allenki Shiva Ram	Shiva Ram	Shiva Ram	Shiva Ram	Shiva Ram
24	18D41A0489	Gunti Varun	Gunti Varun	Gunti Varun	Gunti Varun	Gunti Varun
25	18D41A0420	Bajjuri Bhavana Reddy	Bhavana Reddy	Bhavana Reddy	Bhavana Reddy	Bhavana Reddy
26	18D41A04G2	Paspolla Vikas	Vikas	Vikas	Vikas	Vikas
27	18D41A04G5	Padala Pramod	P. Pramod	P. Pramod	P. Pramod	P. Pramod
28	18D41A0406	Alugubelly. Tejaswini	Tejaswini	Tejaswini	Tejaswini	Tejaswini
29	18D45A0406	Ch. Mahesh	ch. Mahesh	ch. Mahesh	ch. Mahesh	ch. Mahesh
30	18D41A04E2	Mokthala Anil	Anil	Anil	Anil	Anil
31	18D41A0481	J Shiva Prasad	S. Siva	S. Siva	S. Siva	S. Siva

(30)

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Coordinator

Convener

Nethravathi
HOD/ECE

S. S. D.



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1. Foreground Background Extraction

```
clc;
close all;
clear;
%Read Background Image
Background=imread('background.jpg');%Background=rgb2gray(Background);
Background=imresize(Background,[160,160]);
%Read Current Frame
% x1=size(Background);
CurrentFrame=imread('original.jpg');%CurrentFrame=rgb2gray(CurrentFrame)
CurrentFrame=imresize(CurrentFrame,[160 160]);
%Display Background and Foreground
subplot(2,2,1);imshow(Background);title('BackGround');
subplot(2,2,2);imshow(CurrentFrame);title('Current Frame');
%Convert RGB 2 HSV Color conversion
[Background_hsv]=round(rgb2hsv(Background));
[CurrentFrame_hsv]=round(rgb2hsv(CurrentFrame));
Out = bitxor(Background_hsv,CurrentFrame_hsv);
%Convert RGB 2 GRAY
Out=rgb2gray(Out);
%Read Rows and Columns of the Image
[rows columns]=size(Out);
%Convert to Binary Image
for i=1:rows
for j=1:columns
if Out(i,j) >0
BinaryImage(i,j)=1;
else
BinaryImage(i,j)=0;
end
end
end
%Apply Median filter to remove Noise
FilteredImage=medfilt2(BinaryImage,[5 5]);
%Boundary Label the Filtered Image
[L num]=bwlabel(FilteredImage);
STATS=regionprops(L,'all');
cc=[];
removed=0;
%Remove the noisy regions
for i=1:num
dd=STATS(i).Area;
```

```

if (dd < 500)
L(L==i)=0;
removed = removed + 1;
num=num-1;
else
end
end
[L2 num2]=bwlabel(L);
% Trace region boundaries in a binary image.
[B,L,N,A] = bwboundaries(L2);
%Display results
subplot(2,2,3), imshow(L2);title('BackGround Detected');
subplot(2,2,4), imshow(L2);title('Blob Detected');
hold on;
for k=1:length(B),
if(~sum(A(k,:)))
boundary = B{k};
plot(boundary(:,2), boundary(:,1), 'r','LineWidth',2);
for l=find(A(:,k))
boundary = B{l};
plot(boundary(:,2), boundary(:,1), 'g','LineWidth',2);
end
end
end

```

2. Round Object Detection

```

%RGB = imread('10.bmp');
%RGB=imread('E:\D Drive Files 03.11.2014\epsiba phd\Project Code\fusion of local global
estimation\project\Codes\snaps\075.jpg');
imshow(RGB);
I = rgb2gray(RGB);
threshold = graythresh(I);
bw = im2bw(I,threshold);
imshow(bw)
% remove all object containing fewer than 30 pixels
bw = bwareaopen(bw,30);

% fill a gap in the pen's cap
se = strel('disk',2);
bw = imclose(bw,se);

% fill any holes, so that regionprops can be used to estimate
% the area enclosed by each of the boundaries
%bw = imfill(bw,'holes');
figure;

```

```

imshow(bw)
[B,L] = bwboundaries(bw,'noholes');
figure;
% Display the label matrix and draw each boundary
imshow(label2rgb(L, @jet, [.5 .5 .5]))
hold on
for k = 1:length(B)
    boundary = B{k};
    plot(boundary(:,2), boundary(:,1), 'w', 'LineWidth', 2)
end
stats = regionprops(L, 'Area', 'Centroid');

threshold = 0.94;

% loop over the boundaries
for k = 1:length(B)

    % obtain (X,Y) boundary coordinates corresponding to label 'k'
    boundary = B{k};

    % compute a simple estimate of the object's perimeter
    delta_sq = diff(boundary).^2;
    perimeter = sum(sqrt(sum(delta_sq,2)));

    % obtain the area calculation corresponding to label 'k'
    area = stats(k).Area;

    % compute the roundness metric
    metric = 4*pi*area/perimeter^2;

    % display the results
    metric_string = sprintf('%2.2f',metric);

    % mark objects above the threshold with a black circle
    if metric > threshold
        centroid = stats(k).Centroid;
        plot(centroid(1),centroid(2),'ko');
    end

    text(boundary(1,2)-35,boundary(1,1)+13,metric_string,'Color','y',...
        'FontSize',14,'FontWeight','bold');

end

title(['Metrics closer to 1 indicate that ',...
    'the object is approximately round']);

```

3. Edge object detection

```
clc;
clear all;
k=input('Enter the file name','s'); % input image; color image
im=imread(k);
im1=rgb2gray(im);
im1=medfilt2(im1,[3 3]); %Median filtering the image to remove noise%
BW = edge(im1,'sobel'); %finding edges
[imx,imy]=size(BW);
msk=[0 0 0 0 0;
     0 1 1 1 0;
     0 1 1 1 0;
     0 1 1 1 0;
     0 0 0 0 0;];
B=conv2(double(BW),double(msk)); %Smoothing image to reduce the number of connected
components
L = bwlabel(B,8);% Calculating connected components
mx=max(max(L))
% There will be mx connected components.Here U can give a value between 1 and mx for L or
in a loop you can extract all connected components
% If you are using the attached car image, by giving 17,18,19,22,27,28 to L you can extract the
number plate completely.
[r,c] = find(L==17);
rc = [r c];
[sx sy]=size(rc);
n1=zeros(imx,imy);
for i=1:sx
    x1=rc(i,1);
    y1=rc(i,2);
    n1(x1,y1)=255;
end % Storing the extracted image in an array
figure,imshow(im);
figure,imshow(im1);
figure,imshow(B);
figure,imshow(n1,[]);
```

4. Content Based Image Retrieval

```
[filename, pathname] = uigetfile('*.bmp', 'Pick an Image');
a=imread(filename);
figure(1),imshow(a);
X1=a;
```



```

[r c]=size(X1);
a=X1(:,1);
b=X1(:,2);
c=X1(:,3);
[r c]=size(a);
M=r*c;
N=reshape(a,[1 M]);
N=double(N);
p=[];
for i=1:M
    p(i)=N(i)./M;
end
P=sum(sum(p));
HSVmap1 = rgb2ycbcr(X1);
figure(2),imshow(HSVmap1);
fid = fopen('database.txt');

resultValues = [];    % Results matrix...
resultNames = {};
i = 1;                % Indices...
j = 1;

while 1
    imagename = fgetl(fid);
    if ~ischar(imagename), break, end    % Meaning: End of File...

    % [X, RGBmap] = imread(imagename);
    % HSVmap = rgb2hsv(RGBmap);
    [X] = imread(imagename);
    figure(3),imshow(X);
    HSVmap = rgb2ycbcr(X);
    figure(4),imshow(HSVmap);

[D1,D2,D3] = quadratic1(X1, HSVmap1, X, HSVmap);
resultValues1(i) = D1;
resultValues2(i) = D2;
resultValues3(i) = D3;
resultNames(j) = {imagename};
i = i + 1;
j = j + 1;
end

fclose(fid);
[sortedValues1, index1] = sort(resultValues1);    % Sorted results... the vector index
[sortedValues2, index2] = sort(resultValues2);

```

```

[sortedValues3, index3] = sort(resultValues3); % is used to find the resulting files.

%-----RED-----

fid = fopen('colourResults_R_C.txt', 'w+'); % Create a file, over-write old ones.

for i = 1:10 % Store top 10 matches...

    tempstr = char(resultNames(index1(i)));
    fprintf(fid, '%s\r', tempstr);

    disp(resultNames(index1(i)));
    disp(sortedValues1(i));
    disp(' ');
end

fclose(fid);

%-----GREEN-----

fid = fopen('colourResults_G_C.txt', 'w+'); % Create a file, over-write old ones.

for i = 1:10 % Store top 10 matches...
    tempstr = char(resultNames(index2(i)));
    fprintf(fid, '%s\r', tempstr);

    disp(resultNames(index2(i)));
    disp(sortedValues2(i));
    disp(' ');
end

fclose(fid);

%-----BLUE-----

fid = fopen('colourResults_B_C.txt', 'w+'); % Create a file, over-write old ones.

for i = 1:10 % Store top 10 matches...
    tempstr = char(resultNames(index3(i)));
    fprintf(fid, '%s\r', tempstr);

    disp(resultNames(index3(i)));
    disp(sortedValues3(i));
    disp(' ');
end

```

```

fclose(fid);

%return;

disp('Colour part done...');
disp('Colour results saved...');
disp("");

% displayResults1('colourResultsR.txt', 'Colour Results_r...');
% displayResults1('colourResultsG.txt', 'Colour Results_g...');
% displayResults1('colourResultsB.txt', 'Colour Results_b...');
% displayResults1('textureResults_r.txt', 'Texture Results_r...');
% displayResults2('textureResults_g.txt', 'Texture Results_g...');

filename='colourResults_R_C.txt';

fid = fopen(filename);

i = 1;          % Subplot index on the figure...

while 1
    imagename = fgetl(fid);
    if ~ischar(imagename), break, end    % Meaning: End of File...

    [x, map] = imread(imagename);

%   subplot(4,5,i);
%   if i==1;
subplot(3,10,1);
%   figure()
    imshow(x);
    end

    if i==2

subplot(3,10,2);
    imshow(x);
    end

    if i==3
subplot(3,10,3);
    imshow(x);
    end

    if i==4
subplot(3,10,4);

```

```
    imshow(x);
end

    if i==5
subplot(3,10,5);
imshow(x);
end

    if i==6
subplot(3,10,6);
imshow(x);
end

    if i==7
subplot(3,10,7);
imshow(x);
end

    if i==8
subplot(3,10,8);
imshow(x);
end

    if i==9
subplot(3,10,9);
imshow(x);
end

    if i==10
subplot(3,10,10);
imshow(x);
end

    i = i + 1;

end

fclose(fid);

% displayResults1('textureResults_b.txt', 'Texture Results_b...');

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

filename='colourResults_G_C.txt';

fid = fopen(filename);
```

```

i = 1;          % Subplot index on the figure...

while 1
    imagename = fgetl(fid);
    if ~ischar(imagename), break, end    % Meaning: End of File...

    [x, map] = imread(imagename);

    % subplot(4,5,i);
    if i==1;
        subplot(3,10,11);
        imshow(x);
    end

    if i==2

        subplot(3,10,12);

        imshow(x);
    end

    if i==3
        subplot(3,10,13);
        imshow(x);
    end
    if i==4

        subplot(3,10,14);
        imshow(x);
    end

    if i==5

        subplot(3,10,15);
        imshow(x);
    end
    if i==6

        subplot(3,10,16);
        imshow(x);
    end
    if i==7
        subplot(3,10,17);
        imshow(x);
    end
end

```

```

if i==8

subplot(3,10,18);
imshow(x);
end
if i==9

subplot(3,10,19);
imshow(x);
end

if i==10

subplot(3,10,20);
imshow(x);
end

% subimage(x, map);
% imshow(x);
% xlabel(imagename);

    i = i + 1;

end

fclose(fid);

% displayResults1('textureResults_b.txt', 'Texture Results_b...');
filename='colourResults_B_C.txt';

fid = fopen(filename);

i = 1;          % Subplot index on the figure...

while 1
    imagename = fgetl(fid);
    if ~ischar(imagename), break, end    % Meaning: End of File...

    [x, map] = imread(imagename);

% subplot(4,5,i);

if i==1;
subplot(3,10,21);
imshow(x);
end

```

```
if i==2
subplot(3,10,22);
imshow(x);
end
```

```
if i==3
subplot(3,10,23);
imshow(x);
end
```

```
if i==4
subplot(3,10,24);
imshow(x);
end
```

```
if i==5
subplot(3,10,25);
imshow(x);
end
```

```
if i==6
subplot(3,10,26);
imshow(x);
end
```

```
if i==7
subplot(3,10,27);
imshow(x);
end
```

```
if i==8
subplot(3,10,28);
imshow(x);
end
```

```
if i==9
subplot(3,10,29);
imshow(x);
end
```

```
if i==10
subplot(3,10,30);
imshow(x);
end
```

```
% subimage(x, map);  
% imshow(x);  
% xlabel(imagename);
```

```
    i = i + 1;
```

```
end
```

```
fclose(fid);
```