RAJALAKSHMI ENGINEERING COLLEGE

An AUTONOMOUS Institution
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CD19P02–FUNDAMENTALSOFIMAGEPROCESSING

MINIPROJECT

FACEDETECTIONUSINGMATLAB

submittedby

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ABSTRACT

This project focuses on the development of a face detection system using MATLAB,utilizingcomputervisiontechniquestoautomaticallydetectandlocate human faces within images and video frames. The approach leverages the
Viola-Jonesalgorithm,awidelyusedmethodthatemploysHaar-likefeaturesand a cascade of classifiers for real-time face detection. The system processes input images by applying pre-processing steps, detecting facial features, and then identifying faces with high accuracy across various lighting conditions and orientations. MATLAB's extensive libraries and built-in functions, such as the vision.CascadeObjectDetector,areutilizedtoimplementthealgorithm, offering an efficient and scalable solution. The face detection system is capable of identifying multiple faces simultaneously, making it suitable for applications in areas such as security, surveillance, human-computer interaction, and multimedia processing. The project demonstrates the effectiveness of MATLAB for image processing and computer vision tasks, providing a solid foundation for further exploration and development in facial recognition and related fields.

Matlab code for Face detection:

```
clear;
closeall;
fileName=['people.jpeg'];%Exampleimagefilename

%Checkifthefileexistsinthecurrentdirectory if
~exist(fileName, 'file')
   disp('Thespecifiedimagefiledoesnotexist.');
   return;
else
   % Read the selected image
   Image=imread(fileName);
end

%Resizetheimagetoasmallerscaleifit'stoolarge(e.g.,50%oforiginalsize)
scaleFactor = 0.5; % Adjust the scale factor as needed
Image=imresize(Image,scaleFactor);

%Createafacedetectorobject
faceDetector=vision.CascadeObjectDetector();

%Detectfacesintheimage
bboxes=step(faceDetector,Image);

%Displaytheresizedimagewithdetectedfaces
figure;
imshow(Image);
title('DetectedFaces
'); hold on;

%Drawrectanglesaroundeachdetectedface
for i = 1:size(bboxes, 1)
   rectangle('Position',bboxes(i,:),'LineWidth',2,'EdgeColor','r');
```

```
endhol
doff;

%DisplaythenumberoffacesdetectedintheCommandWindow
numFaces = size(bboxes, 1);
fprintf('Numberofdetectedfaces:%d\n',numFaces);
```

OUTPUT