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### SAVEETHA SCHOOL OF ENGINEERING

### DEPARTMENT OF INFORMATION TECHNOLOGY

***ITA05 - COMPUTER VISION***

**Course objectives:**

* Design and develop an innovative image processing in computer vision applications or systems.
* Use and apply appropriate image processing methods for Morphological operations, scaling and image representation.
* Apply and Understand the techniques of Edge Detection Algorithms .
* To design the Object recognition and Facial recognition systems.
* To provide the student with programming experience from implementing computer vision and object recognition applications.

**Course Outcomes:**

After completing the course you will be able to: ·

* Identify basic concepts, models and methods in the field of computer vision.
* Understand the image processing methods for Morphological operations, scaling and image representation.
* Understand the techniques of Edge Detection Algorithms.
* Understand the basic methods of computer vision related to multi-scale representation, and Object detection,Vehicle Detection.
* Develop a design of a computer vision with Open CV for a specific problem.

**COURSE RUBRICS:**

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| --- | --- | --- | --- | --- | --- | --- |
| **AIM& ALGORITHM** | **CODE** | **EXECUTION** | **RESULT** | **GITHUB** | **VIVA** | **TOTAL MARKS** |
| **20** | **20** | **20** | **20** | **10** | **10** | **100** |

**LIST OF EXPERIMENTS**

|  |  |  |
| --- | --- | --- |
| **S.NO** | **EXPERIMENTS** | **CO MAPPED** |
|  | Performbasic Image Handling and processing operations on the image is Read an image in python and Convert an Image to Gray-scale. | **CO1** |
|  | Perform basic Image Handling and processing operations on the image is Read an image in python and Convert an Image to Blur using Gaussian Blur |
|  | Perform basic Image Handling and processing operations on the image is Read an image in python and Convert an Image to show outline using Canny function. |
|  | Implement histogram equalization on the given image and compare it with the original image using Open CV. |
|  | Write a Python function to analyze the histogram of the given input image based on color levels using Open CV. |
|  | Perform basic Image Handling and processing operations on the image is Read an image in python and Convert an Image to Blur using Gaussian Blur. |
|  | Performbasic Image Handling and processing operations on the image is Read an image in python and Convert an Image to Gray-scale |
|  | Perform basic Image Handling and processing operations on the image is Read an image in python and Dilate an Image using Dilate function | **CO2** |
|  | Implement the image scaling techniques to resize the images to both bigger and small sizes. |
|  | Perform a 90-degree rotation clockwise along the y-axis for the given image. |
|  | Perform a 180-degree rotation clockwise along the y-axis for the given image |
|  | Perform a 270-degree rotation clockwise along the y-axis for the given image.. |
|  | Perform Affine Transformation on the given image using python and Open CV. |
|  | Perform Perspective Transformation on the given image using python and Open CV. |
|  | Perform basic Image Handling and processing operations on the image is Read an image in python and detect the corners in the image using Harris Corner Detection function | **CO3** |
|  | Implement a Sobel algorithm using Open CV to filter the input image. |
|  | Design and implement a water marking technique to insert the watermark into the original effectively image using Open CV. |
|  | Implement image cropping, copying and pasting to select a region of interest (ROI) from the source image using Open CV. |
|  | Implement the Erosion Morphological operations technique using Open CV in python. |
|  | Implement the Dilation technique as a Morphological operation to dilate the foreground regions based on Open CV. |
|  | Implement the Opening technique as a Morphological operation to dilate the foreground regions based on Open CV. |
|  | Implement the Closing technique as a Morphological operation to dilate the foreground regions based on Open CV. |
|  | Implement the Top hat technique as a Morphological operation to dilate the foreground regions based on Open CV. |
|  | Implement the Black hat technique as a Morphological operation to dilate the foreground regions based on Open CV. |
|  | Recognize watch from the given image by general Object recognition using Open CV. | **CO4** |
|  | Implement a function to reverse the frames of the video to create a video in reverse mode using Open CV. |
|  | Implement a face detection algorithm using Open CV to detect and locate human faces in the images. |
|  | Implement a vehicle detection algorithm using Open CV to detect and locate vehicles in each frame of the video. |
|  | Implement an Eye detection algorithm using Open CV to detect and locate human eyes in the images. |
|  | Implement a Smile detection algorithm using Open CV to detect and locate human smile in the images. |
|  | Implement a Segmentation algorithm using Open CV to segment the given input image based on the given threshold values. |
|  | Write a Python function to create a white image size entered by the user and then create 4 boxes of Black, Blue, Green and Red respectively on each corner of the image. The size of the colored boxes should be 1/10th the size of the image. (HINT: the arrays of ones and zeros can be in more than 2 dimensions). | **CO5** |
|  | Write a Python function to create a white image size entered by the user and then create a shape of Rectangle using Open CV. |
|  | Write a Python function to create a white image size entered by the user and then create a shape of Circle using Open CV. |
|  | Write a Python function to create a text string entered by the user that must be appeared on the given image using Open CV. |
|  | Write a Python function to subtract the background of the given input image based on color levels using Open CV |
|  | Write a Python function to subtract the foreground of the given input image based on color levels using Open CV. |
|  | Write a Python function to Count the number of faces for the given input image using Open CV. |
|  | Write a Python function to play the given video in reverse mode. |
|  | Write a Python function to extract the text from videos. |