

## Department of Artificial Intelligence and Machine Learning

### COURSE DESIGN, DELIVERY AND ASSESMENT

<b>Course code and Title :</b> AIL75, Open CV Laboratory	Course Credits :0:0:1:0
<b>CIE : 50 Marks</b>	<b>SEE : 50 Marks</b>
Total No of Theory / Tutorial / Lab Hours : 0/0/14/0	

Lesson No. /Session No.	Topic	No. of Hours
1.	Basic Image Handling and Processing Operations	02
2.	Apply the watershed transform on a grayscale image to segment the objects. Display the original image and the segmented output, highlighting the boundaries of the segmented regions.	02
3.	Implement geometric transformations on an image, including translation, rotation, and scaling. Display the original image alongside the transformed images for comparison.	02
4.	Given a set of corresponding points between two images, compute the homography matrix. Use this matrix to warp one image onto another, and display the original and warped images.	02
5.	Show the original image and the transformed image that appears as if viewed from a different angle.	02
6.	Using a calibration pattern (e.g., a checkerboard), perform camera calibration to obtain intrinsic and extrinsic parameters. Display the calibration results and the reprojection error.	02
7.	Given two corresponding sets of points from stereo images, compute the fundamental matrix. Explain its significance and visualize the epipolar lines on both images.	02
8.	Apply edge detection (using Canny or Sobel), line detection (using Hough Transform), and corner detection (using Harris) on a sample image. Display the results of each operation sequentially.	02
9.	Extract SIFT features from an image and visualize keypoints on the original image. Discuss how SIFT can be used for matching between different images.	02
10.	Compare the SURF and HOG feature descriptors by extracting features from the same image. Visualize and discuss the differences in keypoints and feature representation.	02
11.	Implement a region counting algorithm to count the number of distinct regions in a segmented image. Display the original image with the regions labeled by their count.	02
12.	Convert an image from RGB to different color spaces (e.g., HSV, LAB, YCbCr). Display the original image and each converted	02

	image side by side, explaining the significance of each color space.	
13.	Apply a Gaussian filter to an image to reduce noise. Display the original and filtered images side by side for comparison.	02
14.	Combine two overlapping images into a single panoramic image. Display the original images and the final stitched panorama.	02

**Evaluation of Lab Test for 20 marks**

<b>Program Conduction and Result</b>	<b>Write- up</b>	<b>Execution</b>	<b>Viva/Demo</b>	<b>Change of Program</b>	<b>Total</b>
<b>20M</b>	<b>5M</b>	<b>10M</b>	<b>5M</b>	<b>3M</b>	<b>20M</b>

**Evaluation of Lab for 50 marks:**

<b>Evaluation of CIE</b>		<b>Evaluation of Lab test</b>	
Each lab session (12 lab sessions)	30 marks	Lab Test	20 marks
Total (Average of marks evaluated for each lab session)	30*12/12		
<b>Total</b>	<b>30 marks</b>	<b>Total</b>	<b>20 marks</b>
<b>Total</b>		<b>50 marks</b>	