

Total No. of Pages 2

FIFTH SEMESTER

End Semester Examination

ECE-353 Computer Vision

Time: 3 Hour

Roll No. *me105*

B.Tech. (ECE)

(NOV-2017)

Max. Marks: 50

Note: Attempt all Questions. Assume suitable missing data, if any.

- 1 ☒ a Describe 3D geometric transformations. Give their respective degree of freedom with equations. *Diagrams* 8
- ☒ b Give application of homography with equations 2
- 2 ☒ a Transform the given position vector $[3 \ 2 \ 1 \ 1]$ by the following sequence of operations
- i. Translate by -1, -1, -1 in x, y and z respectively 6
- ii. Rotate by +30 degree about x-axis and +45 degree about y-axis
- Find concatenated transformation matrix
- ☒ b What are spatial filters? Explain with example. 4
- 3 ☒ a Derive fundamental and essential matrix 7
- ☒ b Apply following operation on given 2D matrix using 3×3 sampling window
- i. Median filtering

1	4	0	1	3	1
2	2	4	2	2	3
1	0	1	0	1	0
1	2	1	0	2	2
2	5	3	1	2	5
1	1	4	2	3	0

3

P.T.O.

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|---|---|--|---|
| 4 | a | Explain LK tracker when | 7 |
| | | i. Displacement is small | |
| | | ii. Displacement is large | |
| | b | What is stereo reconstruction? | 3 |
| 5 | | Write short notes on any two | |
| | ✓ | i. Dimensionality reduction techniques | 5 |
| | | ii. Disparity Map | + |
| | | iii. Difference between: | 5 |
| | | a. Optical flow and Motion field | |
| | | b. Matlab and OpenCV | |

END

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Roll No. MC105

FIFTH SEMESTER

B.Tech. (ECE-353)

Mid semester Examination

(SEP-2017)

EC-353 COMPUTER VISION

Time: $1\frac{1}{2}$ Hour

Max. Marks: 20

Note: Attempt All questions. Assume suitable missing data, if any.

✓ 1 Give applications of computer vision with respect to state of art with examples. What are three stages of vision and also explain its system architecture.

2 ✓ Compute the full SVD for the following matrix: 5

$$A = \begin{bmatrix} 4 & 0 \\ 3 & -5 \end{bmatrix}$$

3 ✓ Perform convolution and correlation on input image f using mask/kernel w given below.

$\begin{bmatrix} 2 & 2 & 2 & 3 \\ 2 & 1 & 3 & 3 \\ 2 & 2 & 1 & 2 \\ 1 & 3 & 2 & 2 \end{bmatrix}$	$\begin{bmatrix} 1 & -1 & -1 \\ 1 & 2 & -1 \\ 1 & 1 & 1 \end{bmatrix}$
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INPUT IMAGE, f KERNEL MASK, w

4 Write short notes on any two 2 x 2.5

- i Camera calibration
- ii Perspective and Orthographic projection
- iii SIFT