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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Computer Vision (course)**


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Course
outline

How does an
NPTEL
online
course
work? ()

Week 0 ()

Week 1 : ()

Week 2 : ()

- ☐ Lecture 05 :
Projective
Geometry –
Part I
(unit?unit=24&
lesson=25)

Week 2 : Assignment 2

The due date for submitting this assignment has passed.

Due on 2023-08-09, 23:59 IST.

As per our records you have not submitted this assignment.

1) **2 points**

Compute the point of intersection of the lines $2x + 1 = 0$ and $x + 3y + 1 = 0$.

- a) $(-1/6, 1/6)$
b) $(-2/3, 1)$
c) $(-1/2, -1/6)$
d) $(-2/3, -1)$

☐ a)

☐ b)

☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c)

FOR QUESTIONS 2 AND 3:

Given a homography $H = \begin{bmatrix} 1 & 1 & -2 \\ 2 & 0 & 1 \\ 0 & 2 & -1 \end{bmatrix}$. Based on the given data solve the following questions

2 and 3:

2)

2 points

☐ Lecture 06 :
Projective
Geometry –
Part II
(unit?unit=24&
lesson=26)

☐ Lecture 07 :
Projective
Transformation
(unit?unit=24&
lesson=27)

☐ Lecture 08 :
Homography:
Properties –
Part I
(unit?unit=24&
lesson=28)

☐ Lecture 09 :
Homography:
Properties –
Part II
(unit?unit=24&
lesson=29)

☐ Lecture 10 :
Homography:
Properties –
Part III
(unit?unit=24&
lesson=30)

☐ Week 2 :
Lecture
Materials
(unit?unit=24&
lesson=31)

☐ Quiz: Week 2
: Assignment
2
(assessment?
name=174)

☐ Feedback
Form for Week
2
(unit?unit=24&
lesson=32)

Week 3 : ()

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Videos ()**

Text

Find the transformation of the point $(-1, 7)$.

a) $(1, -4, -10)$

b) $(4, -1, 13)$

c) $(4, 1, -10)$

d) $(2, -1, 13)$

☐ a)

☐ b)

☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b)

3)

Find the transformation of the line passing through the points $p1 = (2, 0)$ and $p2 = (1, -3)$. **2 points**

a) $4x - 0.5y - 2.5 = 0$

b) $4x - y + 2.5 = 0$

c) $0.5x - y + 2.5 = 0$

d) $4x + 0.5y - 2.5 = 0$

☐ a)

☐ b)

☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

a)

4)

2 points

Transcripts ()

Books ()

Problem
Solving
Session -
July 2023 ()

Given the circle of radius 5 with centre at $(-3, 2)$ in R^2 and homography $H = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{bmatrix}$.

Which of the following represents the circle by a conic C ?

a) $C = \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & -2 \\ -3 & -2 & -12 \end{bmatrix}$

b) $C = \begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & -2 \\ 3 & -2 & -12 \end{bmatrix}$

c) $C = \begin{bmatrix} -1 & 0 & -3 \\ 0 & 1 & -2 \\ 3 & -2 & -12 \end{bmatrix}$

d) $C = \begin{bmatrix} 1 & 0 & 3 \\ 0 & -1 & -2 \\ -3 & -2 & -12 \end{bmatrix}$

- ☐ a)
☐ b)
☐ c)
☐ d)

No, the answer is incorrect.
Score: 0

Accepted Answers:

b)

5)

2 points

Given a homography $H = \begin{bmatrix} 1 & 1 & -2 \\ 2 & 0 & 1 \\ 0 & 2 & -1 \end{bmatrix}$. Find the vanishing line.

- a) $(1, 1, 0)$
b) $(-0.5, 0.25, 0.25)$.
c) $(-1, 0.5, 0.5)$.
d) $(0, 0, 1)$.

- ☐ a)
☐ b)
☐ c)
☐ d)

No, the answer is incorrect.
Score: 0

Accepted Answers:

b)

FOR QUESTIONS 6 AND 7:

Given a homography $H_1 = \begin{bmatrix} 1 & 1 & -2 \\ 2 & 0 & 1 \\ 0 & 2 & -1 \end{bmatrix}$. Based on the given data solve the following questions 6 and 7:

6)

2 points

Compute the transformation of dual conic $C_{\infty}^* (I.J^T + J.I^T)$ under H_1 .

a) $\begin{bmatrix} 2 & 2 & 2 \\ 2 & 4 & 0 \\ 2 & 0 & 4 \end{bmatrix}$.

b) $\begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$.

c) $\begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$.

d) $\begin{bmatrix} 2 & 2 & 4 \\ 2 & 4 & 0 \\ 2 & 0 & 2 \end{bmatrix}$.

☐ a)☐ b)☐ c)☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

a)

7)

2 points

A point $p(1, 2, 1)$ in plane P_1 is transformed using H_1 to get a point in plane P_2 . The transformed point in P_2 is subjected to another transformation using H_2 matrix to get a point

in plane P_3 . Given $H_2 = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$. Find the transformed point in plane P_3 .

a) $(-1, 5, -9)$

b) $(-1, 9, -5)$.

c) $(1, 9, 5)$.

d) $(1, -5, 9)$.

☐ a)☐ b)☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

c)

8)

Given two lines $l(2, 1, 3)$ and $m(1, 0, -2)$ meet at a point p . Find the Euclidean angle between these two lines. Answer should be in nearest degrees. Discard the decimal values.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 27

2 points

9)

2 points

Recollect Direct Linear Transform (DLT) algorithm for non-homogeneous equation $Ah = 0$. The matrix A is formed from the following equations relating a point X_i and its transformed point X'_i in 2D projective spaces.

$$\begin{bmatrix} 0^T & -w'_i X_i^T & y'_i X_i^T \\ w'_i X_i^T & 0^T & -x'_i X_i^T \\ -y'_i X_i^T & x'_i X_i^T & 0^T \end{bmatrix} \begin{pmatrix} h^1 \\ h^2 \\ h^3 \end{pmatrix} = 0$$

where $X'_i = (x'_i, y'_i, w'_i)^T$ and $X_i = (x_i, y_i, w_i)^T$, $i = 1, 2, \dots, n$. Choose the correct options.

a) Dimension of $A = 2n \times 9$

Dimension of h : 9×1

Rank: 9

b) Dimension of $A = 2n \times 8$

Dimension of h : 8×1

Rank: 8

c) If the origin of the plane lies on the vanishing line, no solution exists.

d) If the origin of the plane lies on the vanishing line, unique solution exists.

☐ a)

☐ b)

☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

b)

c)

10)

2 points

Which of the following statements are true?

- a) The cosine angle between two lines are preserved under homography.
- b) The circular points are fixed points under homography.
- c) Colinearity is preserved under homography.
- d) Affine group have 5 degree of freedom.

☐ a)

☐ b)

☐ c)

☐ d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

a)

c)