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CSC 322

Dr. Bui

Activity 02

Checkpoint 01:

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$$P_{xy} = R_x P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \frac{\pi}{4} & -\sin \frac{\pi}{4} \\ 0 & \sin \frac{\pi}{4} & \cos \frac{\pi}{4} \end{bmatrix} \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix}$$
$$P_x = \begin{pmatrix} 1 \\ 0 \\ \sqrt{2} \end{pmatrix}$$
$$P_{xy} = R_y P_x = \begin{bmatrix} \cos \frac{\pi}{4} & 0 & \sin \frac{\pi}{4} \\ -\sin \frac{\pi}{4} & 1 & 0 \\ 0 & 0 & \cos \frac{\pi}{4} \end{bmatrix} \begin{pmatrix} 1 \\ 0 \\ \sqrt{2} \end{pmatrix}$$
$$P_{xy} = \begin{pmatrix} 1 + \frac{\sqrt{2}}{2} \\ 0 \\ 1 - \frac{\sqrt{2}}{2} \end{pmatrix}$$

Checkpoint 02:

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$$P_{yx} = R_y P = \begin{bmatrix} \cos \frac{\pi}{4} & 0 & \sin \frac{\pi}{4} \\ 0 & 1 & 0 \\ -\sin \frac{\pi}{4} & 0 & \cos \frac{\pi}{4} \end{bmatrix} \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$P_y = \begin{pmatrix} \sqrt{2} \\ 1 \\ 0 \end{pmatrix}$$

$$P_{yx} = R_x P_y = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \frac{\pi}{4} & -\sin \frac{\pi}{4} \\ 0 & \sin \frac{\pi}{4} & \cos \frac{\pi}{4} \end{bmatrix} \begin{pmatrix} \sqrt{2} \\ 1 \\ 0 \end{pmatrix}$$

$$P_{yx} = \begin{pmatrix} \sqrt{2} \\ \sqrt{2}/2 \\ \sqrt{2}/2 \end{pmatrix}$$

Checkpoint 03 & 04:

Checkpoint 03:

$$t_1 = \begin{pmatrix} 3 \\ 0 \\ 3 \end{pmatrix}$$

Checkpoint 04

$$t_2 = \begin{pmatrix} 3 \\ 1 - \sqrt{2} \\ 2 \end{pmatrix}$$

Checkpoint 05:

1)



2)



3)



Checkpoint 06:

The object takes a shape closer (like zoom in) when focal length increased.

Checkpoint 07:

