

Image Geometry Review Problem

Assume a camera at the origin $(0, 0, 0)'$ with axes aligned with the coordinate axes. Assume a focal length of $f = 10$ mm. Where would a point $(10, 20, 30)'$ in the scene be seen in the image plane (ignore mm to pixel conversion for now)?

ANSWER:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1/10 & 0 \end{bmatrix} \begin{bmatrix} 10 \\ 20 \\ 30 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 20 \\ 3 \end{bmatrix} \rightarrow \begin{bmatrix} 3.3 \\ 6.7 \end{bmatrix}$$