

assuming \mathbf{x} is 3×1 \rightarrow camera coordinates, \mathbf{y} is 3×1 \rightarrow pixel coordinates

Going from camera to pixels:

$$\mathbf{Kx} = \mathbf{y} \quad \text{or} \quad \mathbf{x}^t \mathbf{K}^t = \mathbf{y}^t$$

Going from pixels to camera

$$\mathbf{x} = \mathbf{K}^{-1} \mathbf{y} \quad \text{or} \quad \mathbf{x}^t = \mathbf{K}^{-t} \mathbf{y}^t$$